HLTH102: CONTEMPORARY PROBLEMS IN PERSONAL AND COMMUNITY HEALTH



John Dela Cruz Portugal
Victor Valley College

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Detailed Licensing

Licensing

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CHAPTER OVERVIEW

1: Introduction to Personal Health

Learning Objectives

Students will be able to:

- Define health
- Demonstrate understanding of the role of health in the practice of health promotion
- Discuss the concepts of health, health education, health promotion and some related terms
- Identify social determinants of health
- List the levels of disease prevention
- Know the two overarching goals of Healthy People 2010
- Identify the dimensions of health disparity as described in Healthy People 2010
- Provide a literal definition of the term “disparity”
- Interpret three definitions of health disparity
- Distinguish between the terms “health inequality” and “health inequity

1.1: Health and Disease, Influence of Family and Community
1.2: Three Levels of Health Promotion/Disease Prevention
1.3: Culture, Beliefs, Attitudes, and Stigmatized Illnesses
1.4: Determinants of Health, Risk Factors, and Prevention

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1.1: Health and Disease, Influence of Family and Community

Your Own Views on Health

Note down your responses to the following questions:

- What does health mean to you?
- How important is health to you?
- What do you do (if anything) to stay healthy?

Illness and Disease

Although clearly related, the concepts of illness and disease are distinct. People have illness and physicians diagnose and treat disease.

- Disease is an objective term which implies a malfunctioning of the body or part of the body. Disease is pathological and is diagnosed on the basis of recognizable signs and symptoms.
- Illness is the subjective experience of pain, discomfort or disorder.

Although it is mostly safe to say that illness is the subjective experience of disease, it is possible to experience illness without having a disease and it is possible to have a disease and not feel ill.

? Learning Activity

Think of a time when you were ill.

- Can you think of an illness experience which is not disease related?
- Can you think of a disease which may not make you feel ill?

Health Education: Basic Principles

In this session you will learn about the nature of health, health education, health promotion and some related concepts. This will help you to understand the social, psychological and physical components of health.

Definition and Concepts of Health

In the Oxford English Dictionary health is defined as: ‘the state of being free from sickness, injury, disease, bodily conditions; something indicating good bodily condition.”

- Now stop for a moment and think about someone you think is healthy and someone else who you would consider to be not healthy.
  - Look at the definition of health again.
  - Is it similar to the things you thought about when you thought of a healthy and an unhealthy person?

This definition of health is a widely publicized one. But you may have thought of someone who has a disability or wondered about someone who looks OK but who you know does no exercise. Clearly health is not quite as simple as the definition implies.
The concept of health is wide and the way we define health also depends on individual perception, religious beliefs, cultural values, norms, and social class. Generally, there are two different perspectives concerning people’s own definitions of health: a narrow perspective and a broader perspective.

Narrow Perspectives of Health

People with a narrow perspective consider health as the absence of disease or disability or biological dysfunction. According to this view (or model), to call someone unhealthy or sick means there should be evidence of a particular illness. Social, emotional and psychological factors are not believed to cause unhealthy conditions. This model is narrow and limits the definition of health to the physical and physiological capabilities that are necessary to perform routine tasks.

According to this definition, the individual is healthy if all the body parts, cells, tissues and organ systems are functioning well and there is no apparent dysfunction of the body.

Using this model people view the human body in the same terms as a computer, or mechanical device when something is wrong you take it to experts who maintain it. Physicians, unlike behavioral experts, often focus on treatment and clinical interventions with medication rather than educational interventions to bring about behavior change.

Serena's Story

- About two months ago Serena lost her six month old twins. She is grief stricken. She was always slender but now she looks very thin. She cannot sleep, she cannot eat and she doesn't want to talk to anyone.
- Do you think the view of health you have just read about applies to Serena?

This view of health ignores many of the social and psychological causes of ill health. Serena's grief is not an illness but it is certainly affecting her health.

In the next section we will discuss the broader perspective of health which includes other factors in addition to physical ones.

Broader Perspectives of Health

In the previous section you read about a narrow definition of health. This section will help you understand the concept of health in a broader and more holistic way.

Defining Health

The most widely used of the broader definitions of health is that within the constitution of the World Health Organization (1948), which defines health as: A state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity. This classic definition is important, as it identifies the vital components of health. To more fully understand the meaning of health, it is important to understand each of its individual components.

Serena's Story

Think back to Serena.

- Describe her state of health.
- Serena is mentally distressed. She does not by any means have mental and social well-being.

Physical Health

To understand physical health you need to know what is considered to be physically *unhealthy* so that you can contrast the two. Physical health, which is one of the components of the definition of health, could be defined as the absence of diseases or disability of the body parts. Physical health could be defined as the ability to perform routine tasks without any physical restriction.
The following examples can help you to understand someone who is physically unhealthy:

- A person who has been harmed due to a car accident
- A farmer infected by malaria and unable to do their farming duties
- A person infected by tuberculosis and unable to perform his or her tasks.

Think about someone with physical damage, perhaps due to a car accident.

According to the WHO definition, do you see them as healthy?

Also think about someone in your community who you would consider to be physically disabled.

While both of these people may be restricted in their movement and ability to do routine tasks they may still be in a state of physical and mental well-being.

Health is not limited to the biological integrity and the physiological functioning of the human body. Psychological health is also an important aspect of a health definition.

Psychological Health

- Think about people in the community who are showing behavior that may indicate they are going through a period of mental distress in their lives.

- Or think about Serena again.
- Do you think that everyone in distress shows the same sorts of symptoms?

Sometimes it can be really hard from the outside to tell if the person is struggling with mental health issues, but at other times they show symptoms that suggest a lack of self-awareness or personal identity, or an inability of rational and logical decision-making.

At other times it might be apparent that they are not looking after themselves and are without a proper purpose in their life. They may be drinking alcohol and have a non-logical response to any request. You may also notice that they have an inability to maintain their personal autonomy and are unable to maintain good relationships with people around them.

Social component

The social component of health is considered to be the ability to make and maintain 'acceptable' and 'proper' interactions and communicate with other people within the social environment. This component also includes being able to maintain satisfying interpersonal relationships and being able to fulfill a social role. Having a social role is the ability that people have to maintain their own identity while sharing, cooperating, communicating and enjoying the company of others. This is really important when participating in friendships and taking a full part in family and community life.

Which of the following examples could be considered to contribute to social health? Explain your answers.

1. Mourning when a close family member dies
2. Going to a football game or involvement in a community meeting
3. Celebrating traditional cultural events within your community
4. Shopping in the market
5. Creating and maintaining friendship.

In reality all these events could have a social component and help towards building people's social view of health. They all involve interacting with others and gaining support, friendship and in many instances joy from being with other people.

The World Health Organization in its Ottawa Charter said that health promotion is defined as the process of enabling people to increase control over, and to improve, their health. The aim of health promotion is to reduce the underlying causes of ill-health so that there is a long-term reduction in many diseases.

? Summary

Health is a broad concept containing several different aspects. Physical and mental health issues are often interrelated and wellness is expressed through the integration of mental, physical, emotional, spiritual and social health components.

? Self-Assessment Question

What do you understand by the following terms?

- Health
- Health promotion

Answer

Health: When broadly defined, it is a state of complete physical, mental and social wellbeing not merely the absence of disease or infirmity. According to this definition physical, social and psychological factors all contribute to health.

Health promotion: According to the Ottawa Charter, health promotion is defined as the process of enabling people to increase control over, and to improve, their health. Health promotion is aimed at reducing the underlying causes of ill-health so that there is a long term reduction in many diseases.

Definitions of Health

If there are complexities in defining disease, there are even more in defining health. Definitions have evolved over time. In keeping with the biomedical perspective, early definitions of health focused on the theme of the body's ability to function; health was seen

as a state of normal function that could be disrupted from time to time by disease. An example of such a definition of health is: “a state characterized by anatomic, physiologic, and psychological integrity; ability to perform personally valued family, work, and community roles; ability to deal with physical, biologic, psychological, and social stress.”

Just as there was a shift from viewing disease as a state to thinking of it as a process, the same shift happened in definitions of health. Again, the WHO played a leading role when it fostered the development of the health promotion movement in the 1980s. This brought in a new conception of health, not as a state, but in dynamic terms of resiliency, in other words, as “a resource for living.” The 1984 WHO revised definition of health defined it as “the extent to which an individual or group is able to realize aspirations and satisfy needs, and to change or cope with the environment. Health is a resource for everyday life, not the objective of living; it is a positive concept, emphasizing social and personal resources, as well as physical capacities. Thus, health referred to the ability to maintain homeostasis and recover from insults. Mental, intellectual, emotional, and social health referred to a person’s ability to handle stress, to acquire skills, to maintain relationships, all of which form resources for resiliency and independent living.

Wellness

Many practitioners have expanded their focus to include wellness at the positive end of the health continuum. Some distinguish two interacting dimensions: disease versus non-disease and well-being versus ill-being; others expand the number of dimensions to include spiritual, emotional, social, and mental. Last commented that wellness is “a word used by behavioral scientists to describe a state of dynamic physical, mental, social, and spiritual well-being that enables a person to achieve full potential and an enjoyable life.”

But with so much disease to treat, should physicians concern themselves with wellness? Is it appropriate for medicine to seek ways to promote positive health states? Some academics distinguish between a medical care system and a health care system, arguing that, to constrain costs, public funding should be limited to treating illness and restoring the patient’s functional capacity. Others note that activities such as counseling and educating healthy individuals on diet and exercise promote wellness and resiliency, and so fall within the scope of normal practice as a part of preventive medicine. Some go further and argue that physicians should advocate for improved work and environmental conditions, such as promoting walking and cycling rather than driving, and should advocate for policies that redistribute income, limit access to unhealthy foods, and support children’s programs.

As concepts of health and disease continue to broaden, there will no doubt be pressure for physicians to expand their role to include the promotion of positive health states in their patients. Reflecting this trend, clinical trials evaluating new pharmaceuticals must now include improved quality of life as an outcome, which obviously extends beyond simply improving biomedical indicators of pathology.

Discussions of wellness eroded the hold of the biomedical model. In its place, ecological models of health appeared; these recognize the complex interactions among people, their personal characteristics and the environment, and how these influence health.

? Questions to Ponder

1. If no symptoms are produced, is it a disease?
2. Are health and disease different entities or merely different points along a continuum?
3. If so, should we abandon the notion of disease and think only of different levels of health, changing from a categorical to a dimensional model?

Disease or Syndrome?

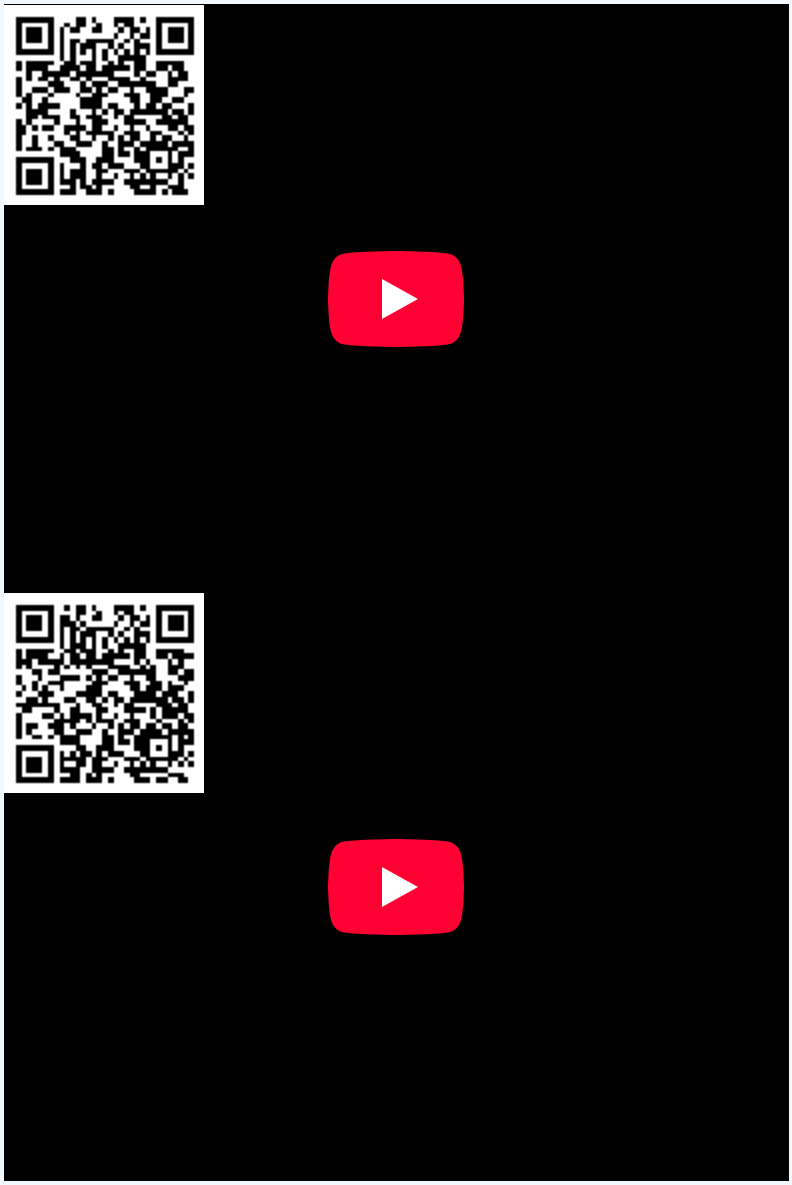
As we learn more about the biological basis for a patient’s illness, it may be reclassified as a disease. For example, constant feelings of tiredness became accepted as the medical condition of chronic fatigue syndrome. Sometimes when a doctor formally labels (diagnoses) a patient’s complaint, the complaint is legitimized and this may reassure the patient. Often, however, a set of signs and symptoms eludes biomedical understanding. If the set is frequent enough to be a recognized pattern, it is termed a syndrome instead of a disease.

A syndrome refers to a complex of symptoms that occur together more often than would be expected by chance alone. Whereas diseases often receive explanatory labels (such as hemorrhagic stroke), syndromes are often given purely descriptive labels (e.g.,

Restless Leg Syndrome). Confusingly, the label ‘syndrome’ often persists long after the cause is discovered, as with Down syndrome, AIDS (Acquired Immunodeficiency Syndrome) or SARS (Severe Acute Respiratory Syndrome). Meanwhile, Chronic Fatigue Syndrome, Fibromyalgia, Irritable Bowel Syndrome, and Restless Leg Syndrome remain syndromic conditions which, so far, are not well explained by conventional biomedical models.

? Learning Activity

Watch these videos – Population Health



These videos by Vancouver Coastal Health are an exploration of differences in health between people and their relationship to things such as income, education, and the neighborhoods in which we live. Residents share real examples about how the social determinants of health impact their lives.

- How has your belief about the relationship between health and other factors changed as a result of watching these videos?

Well-being Concepts

Well-being is a positive outcome that is meaningful for people and for many sectors of society, because it tells us that people perceive that their lives are going well. Good living conditions (e.g., housing, employment) are fundamental to well-being.

Tracking these conditions is important for public policy. However, many indicators that measure living conditions fail to measure what people think and feel about their lives, such as the quality of their relationships, their positive emotions and resilience, the realization of their potential, or their overall satisfaction with life—i.e., their "well-being." Well-being generally includes global judgments of life satisfaction and feelings ranging from depression to joy.

Why is well-being useful for public health?

- Well-being integrates mental health (mind) and physical health (body) resulting in more holistic approaches to disease prevention and health promotion.
- Well-being is a valid population outcome measure beyond morbidity, mortality, and economic status that tells us how people perceive their life is going from their own perspective.
- Well-being is an outcome that is meaningful to the public.
- Advances in psychology, neuroscience, and measurement theory suggest that well-being can be measured with some degree of accuracy.
- Results from cross-sectional, longitudinal and experimental studies find that well-being is associated with:
    - Self-perceived health
    - Longevity
    - Healthy behaviors
    - Mental and physical illness
    - Social connectedness
    - Productivity
    - Factors in the physical and social environment

Well-being can provide a common metric that can help policy makers shape and compare the effects of different policies (e.g., loss of greenspace might impact well-being more so than commercial development of an area).

Measuring, tracking and promoting well-being can be useful for multiple stakeholders involved in disease prevention and health promotion.

Well-being is associated with numerous health-, job-, family-, and economically-related benefits. For example, higher levels of well-being are associated with decreased risk of disease, illness, and injury; better immune functioning; speedier recovery; and increased longevity. Individuals with high levels of well-being are more productive at work and are more likely to contribute to their communities.

Previous research lends support to the view that the negative affect component of well-being is strongly associated with neuroticism and that positive affect component has a similar association with extraversion. This research also supports the view that positive emotions—central components of well-being—are not merely the opposite of negative emotions, but are independent dimensions of mental health that can, and should be fostered. Although a substantial proportion of the variance in well-being can be attributed to heritable factors, environmental factors play an equally if not more important role.

How does well-being relate to health promotion?

Health is more than the absence of disease; it is a resource that allows people to realize their aspirations, satisfy their needs and to cope with the environment in order to live a long, productive, and fruitful life. In this sense, health enables social, economic and personal development fundamental to well-being. Health promotion is the process of enabling people to increase control over, and to improve their health. Environmental and social resources for health can include: peace, economic security, a stable ecosystem, and safe housing. Individual resources for health can include: physical activity, healthful diet, social ties, resiliency, positive emotions, and autonomy. Health promotion activities aimed at strengthening such individual, environmental and social resources may ultimately improve well-being.

How is well-being defined?

There is no consensus around a single definition of well-being, but there is general agreement that at minimum, well-being includes the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), satisfaction with life, fulfillment and positive functioning. In simple terms, well-being can be described as judging life positively and feeling good. For public health purposes, physical well-being (e.g., feeling very healthy and full of energy) is also

viewed as critical to overall well-being. Researchers from different disciplines have examined different aspects of well-being that include the following:

- Physical well-being
- Economic well-being
- Social well-being
- Development and activity
- Emotional well-being
- Psychological well-being
- Life satisfaction
- Domain specific satisfaction
- Engaging activities and work

How is well-being measured?

Because well-being is subjective, it is typically measured with self-reports. The use of self-reported measures is fundamentally different from using objective measures (e.g., household income, unemployment levels, neighborhood crime) often used to assess well-being. The use of both objective and subjective measures, when available, are desirable for public policy purposes.

There are many well-being instruments available that measure self-reported well-being in different ways, depending on whether one measures well-being as a clinical outcome, a population health outcome, for cost-effectiveness studies, or for other purposes. For example, well-being measures can be psychometrically-based or utility-based. Psychometrically-based measures are based on the relationship between, and strength among, multiple items that are intended to measure one or more domains of well-being. Utility-based measures are based on an individual or group's preference for a particular state, and are typically anchored between 0 (death) to 1 (optimum health). Some studies support use of single items (e.g., global life satisfaction) to measure well-being parsimoniously. Peer reports, observational methods, physiological methods, experience sampling methods, ecological momentary assessment, and other methods are used by psychologists to measure different aspects of well-being.

What are some correlates and determinants of individual-level well-being?

There is no sole determinant of individual well-being, but in general, well-being is dependent upon good health, positive social relationships, and availability and access to basic resources (e.g., shelter, income).
Numerous studies have examined the associations between determinants of individual and national levels of well-being. Many of these studies have used different measures of well-being (e.g., life satisfaction, positive affect, psychological well-being), and different methodologies resulting in occasional inconsistent findings related to well-being and its predictors. In general, life satisfaction is dependent more closely on the availability of basic needs being met (food, shelter, income) as well as access to modern conveniences (e.g., electricity). Pleasant emotions are more closely associated with having supportive relationships.

Note

Optional: Watch this video about how America's culture of consumerism undermines our well-being.



Some general findings on associations between well-being and its associations with other factors are as follows:

Genes and Personality

At the individual level, genetic factors, personality, and demographic factors are related to well-being. For example, positive emotions are heritable to some degree, suggesting that there may be a genetically determined set-point for emotions such as happiness and sadness. However, the expression of genetic effects are often influenced by factors in the environment implying that circumstances and social conditions do matter and are actionable from a public policy perspective. Longitudinal studies have found that well-being is sensitive to life events (e.g., unemployment, marriage). Additionally, genetic factors alone cannot explain differences in well-being between nations or trends within nations.

Some personality factors that are strongly associated with well-being include optimism, extroversion, and self-esteem. Genetic factors and personality factors are closely related and can interact in influencing individual well-being.

While genetic factors and personality factors are important determinants of well-being, they are beyond the realm of public policy goals.

Age and Gender

Depending on which types of measures are used (e.g., life satisfaction vs. positive affect), age and gender also have been shown to be related to well-being. In general, men and women have similar levels of well-being, but this pattern changes with age, and has changed over time. There is a U-shaped distribution of well-being by age younger and older adults tend to have more well-being compared to middle-aged adults.

Income and Work

The relationship between income and well-being is complex. Depending on which types of measures are used and which comparisons are made, income correlates only modestly with well-being. In general, associations between income and well-being (usually measured in terms of life satisfaction) are stronger for those at lower economic levels, but studies also have found effects for those at higher income levels. Paid employment is critical to the well-being of individuals by conferring direct access to resources, as well as fostering satisfaction, meaning and purpose for some. Unemployment negatively affects well-being, both in the short- and long-term.

Relationships

Having supportive relationships is one of the strongest predictors of well-being, having a notably positive effect.

What are some correlates of well-being at the national level?

Countries differ substantially in their levels of well-being. Societies with higher well-being are those that are more economically developed, have effective governments with low levels of corruption, have high levels of trust, and can meet citizens' basic needs for food and health. Cultural factors (e.g., individualism vs. collectivism, social norms) also play a role in national estimates of well-being.

What is the difference between health-related quality of life, well-being, flourishing, positive mental health, optimal health, happiness, subjective well-being, psychological well-being, life satisfaction, hedonic well-being, and other terms that exist in the literature?

Subjective well-being typically refers to self-reports contrasted with objective indicators of well-being. The term, "positive mental health" calls attention to the psychological components that comprise well-being from the perspective of individuals interested primarily in the mental health domain. From this perspective, positive mental health is a resource, broadly inclusive of psychological assets and skills essential for well-being. But, the latter generally excludes the physical component of well-being. "Hedonic" well-being focuses on the "feeling" component of well-being (e.g., happiness) in contrast to "eudaimonic" well-being which focuses on the "thinking" component of well-being (e.g., fulfillment). People with high levels of positive emotions, and those who are functioning well psychologically and socially are described by some as having complete mental health, or as "flourishing."

In summary, positive mental health, well-being and flourishing refer to the presence of high levels of positive functioning—primarily in the mental health domain (inclusive of social health). However, in its broadest sense, well-being encompasses physical, mental, and social domains.

Learning Activity: Mapping the Nation's Well Being

Go to the Mapping the Nation's Well Being webpage to find out how well being differs by location.

1. Click on each of the items under Composite Index.
2. Roll your cursor over the various places on the map where you have lived.
3. Compare the well-being of all the places where you have lived or visited.

Public and Population Health

While public health is a familiar term, it can be difficult to give it a single precise definition. Its general focus is on preventing disease and protecting health: "Public health is defined as the organized efforts of society to keep people healthy and prevent injury, illness, and premature death." But this definition does not give us a clear picture of what is, and what is not, included. In part the difficulty arises because public health does not concern a specific organ system, type of disease or therapeutic approach, but employs a variety of approaches to address whatever health issues are most pressing in each place and time. The discipline has seen a succession of names as it wrestled with whether environmental factors, or individual behavior, or societal policies should form the main focus of interventions.

This debate gave rise to the population health perspective, which holds that, while fostering individual responsibility for health, we must also address underlying social determinants, such as poverty or lack of access to care, that constrain people's ability to achieve real gains in health.

Blaming the Victim

As population health is a relatively new concept, uncertainties remain over details of how, precisely, it differs from public health. Both are concerned with patterns of health and illness in groups of people rather than in individuals; both monitor health trends, examine their determinants, propose interventions at the population level to protect and promote health, and discuss options for delivering these interventions. The distinction is subtle, but population health is seen as broader, as offering a unifying paradigm that links disciplines from the biological to the sociological. It provides a rational basis for allocating health resources that balances health protection and promotion against illness prevention and treatment, while also making a significant contribution to basic science.

When public health tackles a health issue, its interventions are focused on maintaining health or preventing disease.

- For example, the **public health approach** to childhood obesity might advocate education for parents and children, subsidized healthy school lunch programs, banning soft drinks in school vending machines, tougher regulations on marketing of junk food to children, promoting physical activity, etc.
- A population health approach would tackle childhood obesity in a broader context. A population health approach might be to consider the food system itself: How do agricultural subsidies affect the price of food? Can city planning policies prevent the problem of urban food deserts where significant areas of the population lack access to a grocery store?

Public health focuses on prevention and health protection services, whereas the population health approach is somewhat broader. It still values "health" as a key outcome, but views issues from a broader perspective and tends to include additional considerations, such as economics, environmental sustainability, social justice, etc.

Learning Activity: Influences on Your Health

Draw a circular diagram with yourself at the center. Position the factors that influence your health around the circle.

- If the link to your health is indirect use dotted lines and if there is a direct link use thicker lines.
- Use distance to denote effect: the closer, the stronger the impact.

Does your diagram support the argument that health and ill-health are influenced – or determined – by a wide range of factors and forces?

- How many different influences did you include?
- Are there any patterns in terms of which factors connected directly and which indirectly?

Sources

Your Own Views on Health: Views on Health, Open Learn, openlearn.open.ac.uk/mod/oucontent/view.php?id=398112§ion=1.3

Illness and Disease: Illness and Disease, Open Learn, openlearn.open.ac.uk/mod/oucontent/view.php?id=398112§ion=6.1

Health Education: Basic Principles: Defining Health, LabSpace, CC-BY-NC-SA, http://labspace.open.ac.uk/mod/oucontent/view.php?id=452833&printable=1#section20.5

Definitions of Health: AFMC Primer on Population Health, The Association of Faculties of Medicine of Canada, CC-BY-NC-SA, phprimer.afmc.ca/Part1-TheoryThinkingAboutHealth/Chapter1ConceptsOfHealthAndIllness/DefinitionsofHealth

Well-being Concepts: Well-being, Centers for Disease Control and Prevention, http://www.cdc.gov/hrqol/wellbeing.htm

Public and Population Health: AFMC Primer on Population Health, The Association of Faculties of Medicine of Canada, CC-BY-NC-SA, phprimer.afmc.ca/Part1-TheoryThinkingAboutHealth/Chapter1ConceptsOfHealthAndIllness/PublicandPopulationHealth

Learning Activity 1.5: Introducing Public Health, Open Learn, openlearn.open.ac.uk/mod/oucontent/view.php?id=400106§ion=2 (CC-BY-NC-SA)

? Exercise 1.1.1

1. How can family history influence an individual's risk of developing certain diseases?
2. Describe one way community resources can support health and wellness.
3. What is the difference between acute and chronic diseases?

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1.2: Three Levels of Health Promotion/Disease Prevention

Levels of Prevention

Three broad categories of determinants of human behavior will be discussed in this study session and you will have an opportunity to learn about the influence of these factors in determining human behavior.

Prevention, as it relates to health, is really about avoiding disease before it starts. It has been defined as the plans for, and the measures taken, to prevent the onset of a disease or other health problem before the occurrence of the undesirable health event. There are three distinct levels of prevention.

Primary prevention—those preventive measures that prevent the onset of illness or injury before the disease process begins.

- Examples include immunization and taking regular exercise.

Secondary prevention—those preventive measures that lead to early diagnosis and prompt treatment of a disease, illness or injury to prevent more severe problems developing. Here health educators such as Health Extension Practitioners can help individuals acquire the skills of detecting diseases in their early stages.

- Examples include screening for high blood pressure and breast self-examination.

Tertiary prevention—those preventive measures aimed at rehabilitation following significant illness. At this level health services workers can work to retrain, re-educate and rehabilitate people who have already developed an impairment or disability.

Read the list of the three levels of prevention again. Think about your experience of health education, whether as an educator or recipient of health education.

- How do you think health education can help with the prevention of disease?
- Do you think it will operate at all these levels?
- Note an example of possible health education interventions at each level where you think health education can be applied.

Health Education can be applied at all three levels of disease prevention and can be of great help in maximizing the gains from preventive behavior**.**

- For example at the primary prevention level — you could educate people to practice some of the preventive behaviors, such as having a balanced diet so that they can protect themselves from developing diseases in the future.
- At the secondary level, you could educate people to visit their local health center when they experience symptoms of illness, such as fever, so they can get early treatment for their health problems.
- At the tertiary level, you could educate people to take their medication appropriately and find ways of working towards rehabilitation from significant illness or disability.

You have learned that:

- Primary prevention includes those preventive measures that come before the onset of illness or injury and before the disease process begins. Examples include immunization and taking regular exercise to prevent health problems developing in the future.
- Secondary prevention includes those preventive measures that lead to early diagnosis and prompt treatment of a disease, illness or injury. This should limit disability, impairment or dependency and prevent more severe health problems developing in the future.
- Tertiary prevention includes those preventive measures aimed at rehabilitation following significant illness. At this level health educators work to retrain, re-educate and rehabilitate the individual who has already had an impairment or disability.

? Summary

- Primary prevention includes those measures that prevent the onset of illness *before* the disease process begins. Immunization against infectious disease is a good example.
- Secondary prevention includes those measures that lead to early diagnosis and prompt treatment of a disease. Breast self-examination is a good example of secondary prevention.

- Tertiary prevention involves the rehabilitation of people who have already been affected by a disease, or activities to prevent an established disease from becoming worse.

Make sure that you are comfortable with the difference between primary prevention activities and secondary prevention activities. Remember that primary prevention activities will actually stop the illness happening, while secondary activities stop the illnesses getting worse.

? Learning Activity

1. Go to Take a Look at Health to find out the major health issues facing Americans are today.
2. Click on various risk factors, demographics, diseases and conditions to see graphic comparisons.
   - What are some of the most common conditions, and how are they related to one another?
   - What can we do to improve our health?

Sources

Levels of Prevention: Health Education, Advocacy and Community Mobilization Chapter: 4. Human Behaviour and Health: 1, Open Learn, LearnSpace, http://labspace.open.ac.uk/mod/oucontent/view.php?id=452836§ion=20.3

Summary: Health Education, Advocacy and Community Mobilisation, Openlearn, cc-by-nc-sa, http://labspace.open.ac.uk/mod/oucontent/view.php?id=452834&printable=1

? Exercise 1.2.1

1. Define primary prevention and give an example.
2. What is secondary prevention, and how does it help in disease management?
3. Explain the goal of tertiary prevention.

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1.3: Culture, Beliefs, Attitudes, and Stigmatized Illnesses

Cultural Lens and How Culture Influences Your Perceptions

Cultural Awareness, Sensitivity, and Safety

Culture can be defined in terms of the shared knowledge, beliefs, and values that characterize a social group. Humans have a strong drive to maintain the sense of identity that comes from membership in an identifiable group. In primeval and nomadic times, a person's survival likely benefited from establishing strong bonds with an in-group of trusted relatives or clan-mates with whom one co-operated and shared, versus an out-group against which there was competition for scarce resources. Within the intermixing of modern society, many of us seek to retain a sense of cultural identity and may often refer to our cultural roots, or use double-barreled descriptions such as Asian-American. It is important that we are all aware of our own cultural influences and how these may affect our perceptions of others, especially in the doctor-patient encounter. In many subtle ways, the cultural identities of both doctor and patient affect their interaction, and in a diverse country this can form an exciting challenge.

Culture and individual

We all perceive others through the filter or perspective of our own cultural upbringing, often without being aware of it: communication can go wrong without our understanding why. The clinician must become culturally aware and sensitive, then culturally competent so that she or he can practice in a manner that is culturally safe.

Cultural awareness

Cultural competency in medical practice requires that the clinician respects and appreciates diversity in society. Culturally competent clinicians acknowledge differences but do not feel threatened by them. "Culturally competent communication leaves our patients feeling that their concerns were understood, a trusting relationship was formed and, above all, that they were treated with respect." While a clinician will often be unfamiliar with the culture of a particular patient, the direct approach is often the best: ask the patient what you need to understand about her culture and background in order to be able to help her. A direct approach helps establish mutual respect and tailor the best and most appropriate care for each patient.

Awareness of one's own culture is an important step towards awareness of, and sensitivity to, the culture and ethnicity of other people. Clinicians who are not aware of their own cultural biases may unconsciously impose their cultural values on other people. "As physicians, we must make multiple communication adjustments each day when interacting with our patients to provide care that is responsive to the diverse cultural backgrounds of patients in our highly multicultural nation."

Cultural safety refers to a doctor-patient encounter in which the patient feels respected and empowered, and that their culture and knowledge has been acknowledged. Cultural safety refers to the patient's feelings in the health care encounter, while cultural competence refers to the skills required by a practitioner to ensure that the patient feels safe.

To practice in a manner that is culturally safe, practitioners should reflect on the power differentials inherent in health service delivery. Taking a culturally safe approach also implies acting as a health advocate: working to improve access to care; exposing the social, political, and historical context of health care; and interrupting unequal power relations. Given that the patient exists simultaneously within several caring systems, influenced by their family, community, and traditions, the culturally safe practitioner allows the patient to define what is culturally safe for them.
Our culture influences the way we perceive virtually everything around us, often unconsciously. Several useful concepts describe issues that can arise:

- *Ethnocentrism*. The sense that one's own beliefs, values, and ways of life are superior to, and more desirable than, those of others. For example, you may be trained in Western medicine, but your patient insists on taking a herbal remedy. You may be tempted to say "So, why are you consulting me, then?" Ethnocentrism is often unconscious and implicit in a person's behavior. Personal reflection is a valuable tool for physicians to critically examine their own ethnocentric views and behaviors.
- *Cultural blindness*. This refers to attempts (often well-intentioned) to be unbiased by ignoring the fact of a person's race. It is illustrated in phrases such as 'being color blind', or 'not seeing race'. However, ignoring cultural differences may make people from another culture feel discounted or ignored; what may be transmitted is the impression that race or culture are unimportant, and that values of the dominant culture are universally applicable. Meanwhile, the person who is culturally blind may feel they

are being fair and unprejudiced, unaware of how they are making others feel. Cultural blindness becomes, in effect, the opposite of cultural sensitivity.

- *Culture shock*. Most physicians come from middle-class families and have not experienced poverty, homelessness or addictions. Exposure to such realities in their patients therefore requires great adaptations and can be distressing. This is a common experience in those who have visited a slum in a developing country, but may also arise at home in confronting abortion, infanticide, or female circumcision.
- *Cultural conflict*. Conflict generated when the rules of one's own culture are contradicted by the rules of another.
- *Cultural imposition (or cultural assimilation or colonialism).* The imposition of the views and values of your own culture without consideration of the beliefs of others.
- *Stereotyping and generalization*. What may be true of a group need not apply to each individual. Hence, talking about cultures can lead to dangerously prejudicial generalizations. Prejudice is the tendency to use preconceived notions about a group in pre-judging one of the group's members, so applying cultural awareness to individuals can be hazardous. Yet, on the other hand, ignoring culture (cultural blindness) can be equally detrimental. The key is to acknowledge and be respectful of differences, and to ask patients to explain their perspective when in doubt

The Relevance of Culture for Health

Culture influences health through many channels:

1. *Positive or negative lifestyle behaviors.* While we often focus on the negative influences of lifestyle behavior—such as drug cultures, or the poor diet of some teen cultures, for example—we should not neglect the positive cultural influences on behaviors and practices. For example, Mormons and Seventh Day Adventists have been found to live longer than the general population, in part because of their lifestyle including the avoidance of alcohol and smoking, but also because of enhanced social support.
2. *Health beliefs and attitudes*. These include what a person views as illness that requires treatment, and which treatments and preventive measures he or she will accept, as with the Jehovah's Witness prohibition on using whole blood products.
3. *Reactions to being sick*. A person's adoption of the sick role (and, hence, how he or she or he reacts to being sick) is often guided by his or her cultural roots. For instance, "machismo" may discourage a man from seeking prompt medical attention, and culture may also influence from whom a person will accept advice.
4. *Communication patterns*, including language and modes of thinking. Beyond these, however, culture may constrain some patients from expressing an opinion to the doctor, or may discourage a wife from speaking freely in front of her husband, for example. Such influences can complicate efforts to establish a therapeutic relationship and, thereby, to help the patient.
5. *Status*. The way in which one culture views another may affect the status of entire groups of people, placing them at a disadvantage. The resulting social inequality or even exclusion forms a health determinant. For example, women in some societies have little power to insist on condom use.

What elements of a patient's culture should a health care provider consider when deciding how best to manage a case?

Cultural influences may affect a patient's reaction to the disease, to suggested therapy, and to efforts to help them prevent recurrences by changing risk factors. Therefore, it may be important for health care providers to find out about such possibilities; they can explain that they need them to tell about their family's and community's feelings about health recommendations. Health care providers should explain that they are not familiar with their community and want them to tell if they may have beliefs or obligations that the health care provider should be aware of, such as any restrictions on diet, medications, etc., if these could be relevant.

Difference between cultural competence and cultural safety

Cultural competence is included within cultural safety, but safety goes beyond competence to advocate actively for the patient's perspective, to protect their right to hold the views they do. When a patient knows that you will honor and uphold their perspective and not try to change it, they will be more likely to accept your recommendations. A physician who practices culturally safe care has reflected on her own cultural biases recognizes them and ensures that her biases do not impact the care that the patient receives. This pattern of self-reflection, education and advocacy is also practiced at the organizational level.

Example: Breast Cancer in Asian Women

Asian women, in general, and Vietnamese women, in particular, have been identified as ethnic groups that are not participating in breast cancer screening programs in the U.S. The reasons are complex and Vietnamese women may be especially vulnerable due to cultural variances in beliefs, health practices, language barriers, lack of access to care due to socio-economic factors, as well as the long term effects of the migration that occurred at the close of the Vietnam war.

Learning Activity

Find out about how culture impacts health decisions and access by visiting each of the websites linked in the list below:

- Hispanic-Latino Culture
- Chinese Culture
- Iraqi Culture
- Vietnamese Culture
- Lesbian, Gay, Bisexual, and Transgender Health Issues

What are some of the positive and/or negative ways that culture impacts an individual's health care decisions and access?

Answer

Some Ethiopians living in the United States may avoid getting treatment if the medical facility is central and visible to their community. This could be due to the social stigma of TB (tuberculosis) in that culture combined with a cultural identity that highly values community participation. So, in order for Ethiopian-Americans to be more likely to get treatment for TB, the medical facility needs to be located in place where patients can come and go without being seen easily.

Stigmatized Illnesses and Health Care

Being disabled because of a disease or injury can lead to benefits – for example, a parking space that is close by. In some instances, the benefits are very attractive but, in most countries of the world, the disabled have no access to any governmental help, and insurance premiums are so high that only a minority of the population can participate in disability compensations schemes. In some situations, disability due to a war injury or to some other situation that confers hero status can also bring social respect and moral prestige to the disabled person.

For the vast majority of disabled people, however, the disadvantages of disability are much more important than its advantages. A restriction of the possibility of participation in normal social life and limitations in the pursuit of personal happiness are often grave and depressing for the person with an impairment that causes a disability.

When the disease or the situation that has produced impairment is stigmatized, the limitations of functions are aggravated and the possibility of compensating disability is significantly reduced. There are a number of diseases that are stigmatized—mental disorders, AIDS, venereal diseases, leprosy, and certain skin diseases. People who have such diseases are discriminated in the health care system, they usually receive much less social support than those who have non-stigmatizing illnesses and—what is possibly worst—they have grave difficulties in organizing their life if their disease has caused an impairment that can lead to disability and handicaps.

Mental disorders probably carry more stigma (and consequent discrimination) than any other illness. The stigma does not stop at the persons who are suffering from a stigmatized illness. Their immediate and even remote families often experience significant social disadvantages. The institutions that provide mental health care are stigmatized. Stigma reduces the value of the persons who have a mental disorder in the eyes of the community and the government.

Medications that are needed in the treatment of mental disorders, for example, are considered expensive even when their cost is much lower than the cost of drugs used in the treatment of other illnesses: they are not considered expensive because of their cost but because they are meant to be used in the treatment of people who are not considered to be of much value to the society.

The awareness of the fact that stigmatization is one of the major—if not the major—obstacles to the improvement of care for people with stigmatized illnesses is gradually growing. In a number of countries governments, non-governmental organizations,

and health institutions have launched campaigns to reduce stigma related to illness. They display posters and distribute leaflets, as well as organize radio and television programs.

There is, however, an important sector employing many individuals that does not participate very actively in the reduction of stigma and in efforts to eliminate the discrimination that follows it. It is the health sector—which, by its definition, could gain from the reduction of stigma almost as much as the individuals who have the stigmatized illness. The managements of general hospitals, as well as heads of various medical departments often refuse to have a department of psychiatry and, if they accept it, they usually assign the worst accommodation for it—in a remote corner of the hospital grounds, for example, or in the lowest (sometimes partly underground) floor. In the order of priority for maintenance or renovation work departments of psychiatry come last although they are often in a pitiful state. Doctors who are not involved in mental health care participate and sometimes excel in making fun of the mentally ill, of psychiatrists, and of mental illness. They will often refuse to deal with physical illness in a person with a mental disorder and send such patients to their psychiatrist, although they are better placed to deal with the physical illness than the psychiatrist.

Nor are the psychiatrists and other mental health care staff doing as much as they should about the reduction of stigma. They seem unaware of the stigmatizing effects of their use of language—they speak of schizophrenics when they should say a person with schizophrenia and about misbehavior or lack of discipline when they should make it clear that behavioral abnormalities are part of the illness they are supposed to recognize and treat. In some countries they requested and received longer holidays or somewhat higher salaries saying that they deserve this because they deal with dangerous patients—although they have publicly proclaimed that mental illness is a disease like any other. They often disregard complaints about the physical health of people with mental disorders and do not do much about them, thus providing sub-optimal care and contributing to the tendency to dismiss whatever people with mental illness may be saying. In their teaching activities, stigmatization as well as the prevention of discrimination and its other consequences often receive only minimal attention.

Perhaps it is impossible for the health care workers themselves to launch large anti-stigma programs: what, however, they should and can do is to examine their own behavior and activity to ensure that they do not contribute to stigmatization and consequent discrimination. They should also participate in the efforts of others to reduce stigma or initiate such efforts whenever possible. Doing nothing about stigma and discrimination that follows it is no longer an acceptable option.

The Cultural Meaning of Illness

Our culture, not our biology, dictates which illnesses are stigmatized and which are not, which are considered disabilities and which are not, and which are deemed contestable (meaning some medical professionals may find the existence of this ailment questionable) as opposed to definitive (illnesses that are unquestionably recognized in the medical profession) (Conrad and Barker 2010). For instance, sociologist Erving Goffman (1963) described how social stigmas hinder individuals from fully integrating into society. The stigmatization of illness often has the greatest effect on the patient and the kind of care he or she receives. Many contend that our society and even our health care institutions discriminate against certain diseases—like mental disorders, AIDS, venereal diseases, and skin disorders (Sartorius 2007). Facilities for these diseases may be sub-par; they may be segregated from other health care areas or relegated to a poorer environment. The stigma may keep people from seeking help for their illness, making it worse than it needs to be. Contested illnesses are those that are questioned or questionable by some medical professionals. Disorders like fibromyalgia or chronic fatigue syndrome may be either true illnesses or only in the patients' heads, depending on the opinion of the medical professional. This dynamic can affect how a patient seeks treatment and what kind of treatment he or she receives.

In terms of constructing the illness experience, culture and individual personality both play a significant role. For some people, a long-term illness can have the effect of making their world smaller, more defined by the illness than anything else. For others, illness can be a chance for discovery, for re-imaging a new self (Conrad and Barker 2007). Culture plays a huge role in how an individual experiences illness. Widespread diseases like AIDS or breast cancer have specific cultural markers that have changed over the years and that govern how individuals—and society—view them.

Today, many institutions of wellness acknowledge the degree to which individual perceptions shape the nature of health and illness. Regarding physical activity, for instance, the Centers for Disease Control (CDC) recommends that individuals use a standard level of exertion to assess their physical activity. This Rating of Perceived Exertion (RPE) gives a more complete view of an individual's actual exertion level, since heart-rate or pulse measurements may be affected by medication or other issues (Centers for Disease

Control 2011a). Similarly, many medical professionals use a comparable scale for perceived pain to help determine pain management strategies.

✔ ✔ Example 1.3.1

Consider these questions:

- What diseases are the most stigmatized?
- Which are the least?
- Is this different in different cultures or social classes?

Solution

Look at these sources to find some answers

Cultural Lens and How Culture Influences Your Perceptions: "The cultural lens and how culture influences your perceptions of others" AFMC Primer on Population Health, The Association of Faculties of Medicine of Canada Public Health Educators' Network, phprimer.afmc.ca/Part1-TheoryThinkingAboutHealth/Chapter3CulturalCompetenceAndCommunication/Culturalawarenesssensitivityandsafety (Accessed March 11, 2012). License: Creative Commons BY-NC-SA

Example: Breast Cancer in Asian Women: Breast Cancer in Asian Women by Denise Little, Ethnomed, CC-BY-NC-ND, http://ethnomed.org/clinical/cancer/breast-cancer-in-asian-women

Stigmatized Illnesses and Health Care: Stigmatized Illnesses and Health Care, Norman Sartorius, Croatian Medical Journal, 2007 June; 48(3): 396–397, CC-BY-NC, www.ncbi.nlm.nih.gov/pmc/articles/PMC2080544/

The Cultural Meaning of Illness: OpenStax College, CC-BY, The Social Construction of Health, Connexions, May 18, 2012, http://cnx.org/content/m42927/1.2/

Sources

? Exercise 1.3.1

1. How can cultural beliefs impact attitudes toward health and illness?
2. What is stigma, and how might it affect a person with a health condition?
3. Provide an example of a stigmatized illness and explain why stigma occurs.

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1.4: Determinants of Health, Risk Factors, and Prevention

Determinants of Health

- What makes some people healthy and others unhealthy?
- How can we create a society in which everyone has a chance to live long healthy lives?

? Learning Activity

Watch this video about Determinants of Health[1]:



This video demonstrates some of the factors that make some people healthy and others unhealthy. Two examples in this video serve to illustrate determinants of health, as well as interventions which can change determinants of health and lead to a specific health outcome or outcomes. The video then explains the four phases of the intervention life cycle.

The range of personal, social, economic, and environmental factors that influence health status are known as determinants of health.

Determinants of health fall under several broad categories:

- Social factors
- Health services
- Individual behavior
- Biology and genetics

It is the interrelationships among these factors that determine individual and population health. Because of this, interventions that target multiple determinants of health are most likely to be effective. Determinants of health reach beyond the boundaries of traditional health care and public health sectors; sectors such as education, housing, transportation, agriculture, and environment can be important allies in improving population health.

Policymaking

Policies at the local, State, and Federal level affect individual and population health. Increasing taxes on tobacco sales, for example, can improve population health by reducing the number of people using tobacco products.

Some policies affect entire populations over extended periods of time while simultaneously helping to change individual behavior. For example, the 1966 Highway Safety Act and the National Traffic and Motor Vehicle Safety Act authorized the Federal

Government to set and regulate standards for motor vehicles and highways. This led to an increase in safety standards for cars, including seat belts, which in turn, reduced rates of injuries and deaths from motor vehicle accidents.

Social

Social determinants of health reflect social factors and the physical conditions in the environment in which people are born, live, learn, play, work and age. Also known as social and physical determinants of health, they impact a wide range of health, functioning and quality of life outcomes.

Examples of social determinants include:

- Availability of resources to meet daily needs, such as educational and job opportunities, living wages, or healthful foods
- Exposure to crime, violence, and social disorder, such as the presence of trash
- Social support and social interactions
- Exposure to mass media and emerging technologies, such as the Internet or cell phones
- Socioeconomic conditions, such as concentrated poverty
- Quality schools
- Transportation options
- Public safety
- Residential segregation

Examples of physical determinants include:

- Natural environment, such as plants, weather, or climate change
- Built environment, such as buildings or transportation
- Worksites, schools, and recreational settings
- Housing, homes, and neighborhoods
- Exposure to toxic substances and other physical hazards
- Physical barriers, especially for people with disabilities
- Aesthetic elements, such as good lighting, trees, or benches

Poor health outcomes are often made worse by the interaction between individuals and their social and physical environment.

For example, millions of people in the United States live in places that have unhealthy levels of ozone or other air pollutants. In counties where ozone pollution is high, there is often a higher prevalence of asthma in both adults and children compared with State and national averages. Poor air quality can worsen asthma symptoms, especially in children.[2]

Health Services

Both access to health services and the quality of health services can impact health. Healthy People 2020 directly addresses access to health services as a topic area and incorporates quality of health services throughout a number of topic areas.

Lack of access, or limited access, to health services greatly impacts an individual's health status. For example, when individuals do not have health insurance, they are less likely to participate in preventive care and are more likely to delay medical treatment.[3]

Barriers to accessing health services include:

- Lack of availability
- High cost
- Lack of insurance coverage
- Limited language access

These barriers to accessing health services lead to:

- Unmet health needs
- Delays in receiving appropriate care
- Inability to get preventive services
- Hospitalizations that could have been prevented

Individual Behavior

Individual behavior also plays a role in health outcomes. For example, if an individual quits smoking, his or her risk of developing heart disease is greatly reduced.

Many public health and health care interventions focus on changing individual behaviors such as substance abuse, diet, and physical activity. Positive changes in individual behavior can reduce the rates of chronic disease in this country.

Examples of individual behavior determinants of health include:

- Diet
- Physical activity
- Alcohol, cigarette, and other drug use
- Hand washing

Biology and Genetics

Some biological and genetic factors affect specific populations more than others. For example, older adults are biologically prone to being in poorer health than adolescents due to the physical and cognitive effects of aging.

Sickle cell disease is a common example of a genetic determinant of health. Sickle cell is a condition that people inherit when both parents carry the gene for sickle cell. The gene is most common in people with ancestors from West African countries, Mediterranean countries, South or Central American countries, Caribbean islands, India, and Saudi Arabia.

Examples of biological and genetic social determinants of health include:

- Age
- Sex
- HIV status
- Inherited conditions, such as sickle-cell anemia, hemophilia, and cystic fibrosis
- Carrying the BRCA1 or BRCA2 gene, which increases risk for breast and ovarian cancer
- Family history of heart disease

Social Determinants of Health

Social determinants of health are economic and social conditions that influence the health of people and communities. These conditions are shaped by the amount of money, power, and resources that people have, all of which are influenced by policy choices. Social determinants of health affect factors that are related to health outcomes. Factors related to health outcomes include:

- How a person develops during the first few years of life (early childhood development)
- How much education a persons obtains
- Being able to get and keep a job
- What kind of work a person does
- Having food or being able to get food (food security)
- Having access to health services and the quality of those services
- Housing status
- How much money a person earns
- Discrimination and social support

What are determinants of health and how are they related to social determinants of health?

Determinants of health are factors that contribute to a person’s current state of health. These factors may be biological, socioeconomic, psychosocial, behavioral, or social in nature. Scientists generally recognize five determinants of health of a population:

- Genes and biology: for example, sex and age
- Health behaviors: for example, alcohol use, injection drug use (needles), unprotected sex, and smoking
- Social environment or social characteristics: for example, discrimination, income, and gender
- Physical environment or total ecology: for example, where a person lives and crowding conditions

- Health services or medical care: for example, access to quality health care and having or not having insurance

Other factors that could be included are culture, social status, and healthy child development. Scientists do not know the precise contributions of each determinant at this time.

In theory, genes, biology, and health behaviors together account for about 25% of population health. Social determinants of health represent the remaining three categories of social environment, physical environment/total ecology, and health services/medical care. These social determinants of health also interact with and influence individual behaviors as well. More specifically, social determinants of health refer to the set of factors that contribute to the social patterning of health, disease, and illness.

Why is addressing the role of social determinants of health important?

Addressing social determinants of health is a primary approach to achieving health equity. Health equity is "when everyone has the opportunity to 'attain their full health potential' and no one is 'disadvantaged from achieving this potential because of their social position or other socially determined circumstance." Health equity has also been defined as "the absence of systematic disparities in health between and within social groups that have different levels of underlying social advantages or disadvantages—that is, different positions in a social hierarchy." Social determinants of health such as poverty, unequal access to health care, lack of education, stigma, and racism are underlying, contributing factors of health inequities.

? Learning Activity

Go to the Your Health Profile webpage and answer the questions.

- What conditions do people with your health profile most frequently experience?
- Are you under- or overweight?

Risk Factors

What is a risk factor?

Risk factors are things in your life that increase your chances of developing a condition or disease. They can include things like family history, exposures to things in the environment, being a certain age or sex, being from a certain ethnic group, or already having a health condition. If you do have risk factors, your doctor or nurse will most likely want you to be screened or immunized at a younger age or more often than what is recommended. Check with your doctor or nurse to find out if you need to have specific health screenings and how often you will need them.

Understanding Risk Factors

Part of learning how to take charge of your health requires understanding your risk factors for different diseases. Risk factors are things in your life that increase your chances of getting a certain disease. Some risk factors are beyond your control. You may be born with them or exposed to them through no fault of your own. Some risk factors that you have little or no control over include your:

- Family history of a disease
- Sex/gender—male or female
- Ancestry

Some risk factors you can control include

- What you eat
- How much physical activity you get
- Whether you use tobacco
- How much alcohol you drink
- Whether you use illegal drugs
- Whether you use your seat belt

In fact, it has been estimated that almost 35 percent of all U.S. early deaths in 2000 could have been avoided by changing just three behaviors:

- Stopping smoking
- Eating a healthy diet (for example, eating more fruits and vegetables and less red meat)
- Getting more physical activity

? Learning Activity: Find Out about Your Own Health Risks

Fill out the questionnaire at Keep Me Well to get the following results:

- Scorecard: An easy-to-read summary of your results that will show you where to focus your efforts to best improve your health.
- My Report: A more detailed report that provides feedback and links to trusted health information websites that will help you take action to lower your risk for chronic disease.
- Local Community Supports and Programs: A list of resources in your area that can help you take action to improve your health.

Having more than one risk factor

You can have one risk factor for a disease or you can have many. The more risk factors you have, the more likely you are to get the disease. For example, if you eat healthy, exercise on a regular basis, and control your blood pressure, your chances of getting heart disease are less than if you are diabetic, a smoker, and inactive. To lower your risks, take small steps toward engaging in a healthy lifestyle, and you'll see big rewards.

Inheriting risk—your family health history

Rarely, you can inherit a mutated gene that alone causes you to get a disease. Genes control chemical reactions in our bodies. If you inherit a faulty gene, your body may not be able to carry out an important chemical reaction. For instance, a faulty gene may make your blood unable to clot. This problem is at the root of a rare bleeding disorder. More often, you can inherit genes from one or both of your parents that put you at higher risk of certain diseases. But having a gene for a certain disease does not always mean you will get it. There are many unknown factors that may raise or lower your chances of getting the disease. People with a family health history of chronic disease may have the most to gain from making lifestyle changes. You can't change your genes, but you can change behaviors that affect your health, such as smoking, inactivity, and poor eating habits. In many cases, making these changes can reduce your risk of disease even if the disease runs in your family. Another change you can make is to have screening tests, such as mammograms and colorectal cancer screening. These screening tests help detect disease early.

People who have a family health history of a chronic disease may benefit the most from screening tests that look for risk factors or early signs of disease. Finding disease early, before symptoms appear, can mean better health in the long run. Your family's health history could be important for determining health risks for you and your children. Learn more about how to document your family's health history and share it with your doctor. It is important to talk to your doctor or nurse about your individual health risks, even if you have to bring it up yourself. And it's important for your doctor to know not just about your health, but your family health history as well. Come to health care visits armed with information about you, your children, siblings, parents, grandparents, aunts and uncles, and nieces and nephews, including

- Major medical conditions and causes of death
- Age of disease onset and age at death
- Ethnic background
- General lifestyle information like heavy drinking and smoking

Family Health History

Family health history can help your doctor make a diagnosis if you or your children shows signs of a disorder. It can reveal whether you or your children have an increased risk for a disease; if so, the doctor might suggest screening tests. Many genetic disorders first become obvious in childhood, and knowing about a family health history of a genetic condition can help find and treat the condition early.

Update your family health history information regularly and share new information with your doctor. Remember that relatives can be newly diagnosed with conditions between doctor's visits.

The best way to learn about your family health history is to ask questions. Talk at family gatherings and record your family's health information—it could make a difference in your child's life.

? Learning Activity: My Family Health Portrait

Use the US Surgeon General's online tool for collecting family health histories, called My Family Health Portrait. (If you are not able to do this activity with your own birth family, you can do this activity for someone else who does know his/her family health history.)

- Enter your family health history.
- Record the names of your close relatives from both sides of the family: parents, siblings, grandparents, aunts, uncles, nieces, and nephews. Include conditions each relative has or had and at what age the conditions were first diagnosed.
- For relatives who are deceased, include the cause of death and the age at death.
- Print your family health history to share with family or your health care worker.
- Save your family health history so you can update it over time.
- Talk with your health care worker about your family health history

? Optional Learning Activity: Healthier You

Complete a personal health risk assessment and family health history. Determine what you can do to enhance your own health and decrease your health risks.

Check out these resources to find out more about Family Health History

- NIH Senior Health: Creating a Family Health History
- Family Health History

Examples of actions to take:

- Bring your weight and BMI to normal levels
- Stop smoking
- Bring your cholesterol levels to a healthy level
- Increase your aerobic, muscle-strengthening, and bone-strengthening activities
- Reduce your consumption of alcohol

Factors Affecting Human Health

Risk factors are those inherited, environmental and behavioral influences which are considered to increase the likelihood of physical or mental health problems in the future. After studying this session you will be able to describe health risk factors and explain their association with human health.

Health and human behavior

Behavior is an action that has a specific frequency, duration and purpose whether conscious or unconscious. It is what we do and how we act.

Health behaviors are those personal behavior patterns, actions and habits that people perform in order to stay healthy, in order to restore their health when they get sick and in order to improve their health status.

Types of health behaviors

In this section, you will learn about six different types of health behavior that people may perform — from the initial stages of preventing diseases up to their actions that may be associated with attempts to rehabilitate themselves after a bout of illness.

- *Preventive health behaviors*: These are actions that healthy people undertake to keep themselves or others healthy and prevent disease or detect illness when there are no symptoms. Examples include handwashing with soap, using insecticide treated mosquito nets and exclusive breastfeeding to age six months.

- *Illness behaviors:* These include any activities undertaken by individuals who perceive themselves to be ill. This would include recognition of early symptoms and prompt self referral for treatment.
- *Sick-role behaviors:* These include any activity undertaken by individuals who consider themselves to be ill, for the purpose of getting well. It includes receiving treatment from medical providers and generally involves a whole range of potentially dependent behaviors. It may lead to some degree of exemption from one's usual responsibilities. For example a person who feels that he is ill might visit the nearby health center and receive tablets to be taken home, and might then not do as much work as normal.
- *Compliance behaviors:* This means the person will be following a course of prescribed treatment according to the instructions that the health worker has given them.
- *Utilization behaviors:* This is the sort of behavior that is described when people use their health services such as antenatal care, family planning, immunization, taking a sick person for treatment, etc.
- *Behavior* is an action that has a specific frequency, duration and purpose whether conscious or unconscious. It is what we do and how we act. People stay healthy or become ill often as a result of their own actions or behavior.

Preventive health behaviors are actions that healthy people undertake to keep themselves or others healthy. Examples include good nutrition and exclusive breastfeeding until the age of six months.

- *Illness behaviors* include any activities undertaken by an individual who perceives him or herself to be ill.
- *Compliance behaviors* are to do with following a course of prescribed treatment regimes.
- *Utilization behaviors* involve the utilization of health services such as antenatal care or family planning.
- *Rehabilitation behaviors* are the ways that people behave after a serious illness to get themselves better again.
- *Determinants of health* are the biological, environmental, behavioral, organizational, political and social factors that contribute either positively or negatively to the health status of individuals, groups and communities.
- *Risk factors* are those inherited, environmental and behavioral influences which are known or thought to increase the likelihood of physical or mental health problems. Risk factors increase the probability of morbidity and premature mortality, but do not guarantee that people with the risk factors will suffer the consequences.
- *Non-modifiable (non-changeable or non-controllable) risk factors* include factors such as age, sex and inherited genes — things that individuals cannot change or do not have control over.

? Learning Activity

Choose one healthy lifestyle habit that you would like to adopt or improve.

- What habit do you want to change or improve?
- Why did you choose this habit?
- Try using the online Health Month game to track your progress.

Sources

Determinants of Health: Healthy People 2020, USDHHS, www.healthypeople.gov/2020/about/DOHAbout.aspx

Social Determinants of Health: Social Determinants of Health, Centers for Disease Control and Preventions, FAQs, http://www.cdc.gov/socialdeterminants/FAQ.html

Risk Factors: A Lifetime of Good Health, Your Guide to Staying Healthy, Womenshealth.gov, Department of Health and Human Services, Office of Women's Health, www.womenshealth.gov/publications/our-publications/lifetime-good-health/LifetimeGoodHealth-English.pdf

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1. This video was created by The Office of Disease Prevention and Health Promotion (ODPHP), U.S. Department of Health and Human Services. ↵
2. State of the Air [Internet]. Washington, DC: American Lung Association. Available from: www.stateoftheair.org↵
3. Agency for Healthcare Research and Quality (AHRQ). National healthcare disparities report, 2008. Rockville (MD): U.S. Department of Health and Human Services, AHRQ; 2009 Mar. Pub no. 09-002. Available from: http://www.ahrq.gov/qual/nhdr08/nhdr08.pdf. ↵

Exercise 1.4.1

1. What are social determinants of health? Give one example.
2. Distinguish between modifiable and non-modifiable risk factors.
3. Why is it important to consider multiple determinants when designing health interventions?

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CHAPTER OVERVIEW

2: Nutritional Health

Learning Objectives

- List the dietary guidelines for Americans
- List the health risks of obesity
- Describe eating disorders

2.1: Nutritional Guidelines- Carbohydrates, Fats, and Proteins
2.2: Myths and Misconceptions about Nutrition
2.3: Ethnic Foods
2.4: Dietary Supplements
2.5: Body Composition
2.6: Obesity
2.7: Diet and Weight Control
2.8: Eating Disorders

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2.1: Nutritional Guidelines- Carbohydrates, Fats, and Proteins

A healthy diet can reduce the risk of major chronic diseases such as heart disease, diabetes, osteoporosis, and some cancers.

The Dietary Guidelines for Americans, 2010 provides evidence-based nutrition information and advice for people age 2 and older. They serve as the basis for Federal food and nutrition education programs.
They emphasize three major goals for Americans:

- Balance calories with physical activity to manage weight
- Consume more of certain foods and nutrients such as fruits, vegetables, whole grains, fat-free and low-fat dairy products, and seafood
- Consume fewer foods with sodium (salt), saturated fats, trans fats, cholesterol, added sugars, and refined grains

The Dietary Guidelines for Americans, 2010 include 23 key recommendations for the general population and 6 additional key recommendations for specific population groups, such as pregnant women. The recommendations are intended to help people choose an overall healthy diet.

Dietary Guidelines recommendations traditionally have been intended for healthy Americans ages 2 years and older. However, Dietary Guidelines for Americans, 2010 is being released at a time of rising concern about the health of the American population. Poor diet and physical inactivity are the most important factors contributing to an epidemic of overweight and obesity affecting men, women, and children in all segments of our society. Even in the absence of overweight, poor diet and physical inactivity are associated with major causes of morbidity and mortality in the United States. Therefore, the Dietary Guidelines for Americans, 2010 is intended for Americans ages 2 years and older, including those at increased risk of chronic disease.

Poor diet and physical inactivity are the most important factors contributing to an epidemic of overweight and obesity in this country. The most recent data indicate that 72 percent of men and 64 percent of women are overweight or obese, with about one-third of adults being obese. Even in the absence of overweight, poor diet and physical inactivity are associated with major causes of morbidity and mortality. These include cardiovascular disease, hypertension, type 2 diabetes, osteoporosis, and some types of cancer. Some racial and ethnic population groups are disproportionately affected by the high rates of overweight, obesity, and associated chronic diseases. These diet and health associations make a focus on improved nutrition and physical activity choices ever more urgent. These associations also provide important opportunities to reduce health disparities through dietary and physical activity changes.

Dietary Guidelines for Americans, 2010 also recognizes that in recent years nearly 15 percent of American households have been unable to acquire adequate food to meet their needs. This dietary guidance can help them maximize the nutritional content of their meals. Many other Americans consume less than optimal intake of certain nutrients even though they have adequate resources for a healthy diet. This dietary guidance and nutrition information can help them choose a healthy, nutritionally adequate diet. The intent of the Dietary Guidelines is to summarize and synthesize knowledge about individual nutrients and food components into an interrelated set of recommendations for healthy eating that can be adopted by the public.

Taken together, the Dietary Guidelines recommendations encompass two over-arching concepts:

Maintain calorie balance over time to achieve and sustain a healthy weight.

- People who are most successful at achieving and maintaining a healthy weight do so through continued attention to consuming only enough calories from foods and beverages to meet their needs and by being physically active. To curb the obesity epidemic and improve their health, many Americans must decrease the calories they consume and increase the calories they expend through physical activity.

Focus on consuming nutrient-dense foods and beverages.

- Americans currently consume too much sodium and too many calories from solid fats, added sugars, and refined grains. These replace nutrient-dense foods and beverages and make it difficult for people to achieve recommended nutrient intake while controlling calorie and sodium intake. A healthy eating pattern limits intake of sodium, solid fats, added sugars, and refined grains and emphasizes nutrient-dense foods and beverages;vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, lean meats and poultry, eggs, beans and peas, and nuts and seeds. A basic premise of the Dietary Guidelines is that nutrient needs should be met primarily through consuming foods. In certain cases, fortified foods and dietary

supplements may be useful in providing one or more nutrients that otherwise might be consumed in less than recommended amounts.

A healthy eating pattern needs to not only to promote health and help to decrease the risk of chronic diseases, but it also should prevent foodborne illness. Four basic food safety principles (Clean, Separate, Cook, and Chill) work together to reduce the risk of foodborne illnesses. In addition, some foods (such as milks, cheeses, and juices that have not been pasteurized, and undercooked animal foods) pose high risk for foodborne illness and should be avoided.

Dietary Guidelines for Americans key recommendations are the most important in terms of their implications for improving public health.

To get the full benefit, individuals should carry out the Dietary Guidelines recommendations in their entirety as part of an overall healthy eating pattern.

Dietary Guidelines For Americans, 2010

Individuals should meet the following recommendations as part of a healthy eating pattern while staying within their calorie needs.

- Increase vegetable and fruit intake. Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.
- Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.
- Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.
- Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds. Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry. Replace protein foods that are higher in solid fats with choices that are lower in solid fats and calories and/or are sources of oils.
- Use oils to replace solid fats where possible. Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

Balancing Calories to Manage Weight

- Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors. Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.
- Increase physical activity and reduce time spent in sedentary behaviors. Maintain appropriate calorie balance during each stage of life; childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.
- Reduce daily sodium intake to less than 2,300 milligrams (mg) and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the U.S. population, including children, and the majority of adults.
- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids. Consume less than 300 mg per day of dietary cholesterol. Keep trans fatty acid consumption as low as possible by limiting foods that contain synthetic sources of trans fats, such as partially hydrogenated oils, and by limiting other solid fats. Reduce the intake of calories from solid fats and added sugars.
- Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.
- If alcohol is consumed, it should be consumed in moderation up to one drink per day for women and two drinks per day for men and only by adults of legal drinking age.

Foods and Food Components to Reduce

- Reduce daily sodium intake to less than 2,300 milligrams (mg) and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the U.S. population, including children, and the majority of adults.

- Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.
- Consume less than 300 mg per day of dietary cholesterol.
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- Reduce the intake of calories from solid fats and added sugars.
- Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.
- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age.

Building Healthy Eating Patterns

- Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.
- Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.
- Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.

Recommendations for Specific Population Groups

Women capable of becoming pregnant

- Choose foods that supply heme iron, which is more readily absorbed by the body, additional iron sources, and enhancers of iron absorption such as vitamin C-rich foods.
- Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.

Women who are pregnant or breastfeeding

- Consume 8 to 12 ounces of seafood per week from a variety of seafood types.
- Due to their high methyl mercury content, limit white (albacore) tuna to 6 ounces per week and do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.
- If pregnant, take an iron supplement, as recommended by an obstetrician or other health care provider. Individuals ages 50 years and older Consume foods fortified with vitamin B12, such as fortified cereals, or dietary supplements.

Building Healthy Eating Patterns

- Select an eating pattern that meets nutrient needs over time at an appropriate calorie level.
- Account for all foods and beverages consumed and assess how they fit within a total healthy eating pattern.
- Follow food safety recommendations when preparing and eating foods to reduce the risk of foodborne illnesses.
- Reduce daily sodium intake to less than 2,300 milligrams (mg) and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease.

Individuals ages 50 years and older

- Consume foods fortified with vitamin B12, such as fortified cereals, or dietary supplements.

Children

Children are a particularly important focus of the Dietary Guidelines for Americans because of the growing body of evidence documenting the vital role that optimal nutrition plays throughout the lifespan. Today, too many children are consuming diets with too many calories and not enough nutrients and are not getting enough physical activity. Approximately 32 percent of children and adolescents ages 2 to 19 years are overweight or obese, with 17 percent of children being obese. In addition, risk factors for adult chronic diseases are increasingly found in younger ages. Eating patterns established in childhood often track into later life, making early intervention on adopting healthy nutrition and physical activity behaviors a priority. 81.1 million Americans, 37 percent of the population, have cardiovascular disease.

Diet-related Chronic Disease

Major risk factors include high levels of blood cholesterol and other lipids, type 2 diabetes, hypertension (high blood pressure), metabolic syndrome, overweight and obesity, physical inactivity, and tobacco use. 16 percent of the U.S. adult population has high 14 total blood cholesterol.

Cardiovascular Disease

81.1 million Americans—37 percent of the 13 population—have cardiovascular disease. Major risk factors include high levels of blood cholesterol and other lipids, type 2 diabetes, hypertension (high blood pressure), metabolic syndrome, overweight and obesity, physical inactivity, and tobacco use. 16 percent of the U.S. adult population has high 14 total blood cholesterol.

Hypertension

74.5 million Americans, 34 percent of U.S. 15 adults, have hypertension. Hypertension is a major risk factor for heart disease, stroke, congestive heart failure, and kidney disease. Dietary factors that increase blood pressure include excessive sodium and insufficient potassium intake, overweight and obesity, and excess alcohol consumption. 36 percent of American adults have prehypertension, blood pressure numbers that are higher than normal, but not yet in the 16 hypertension range. Nearly 24 million people, almost 11 percent of the population, ages 20 years and older have diabetes. The vast majority of cases are type 2 diabetes, which is heavily influenced by diet and physical activity. About 78 million Americans, 35 percent of the U.S. adult population ages 20 years or 18older, have pre-diabetes. Pre-diabetes (also called impaired glucose tolerance or impaired fasting glucose) means that blood glucose levels are higher than normal, but not high enough to be called diabetes.

Cancer

Almost one in two men and women, approximately 41 percent of the population, will be 19 diagnosed with cancer during their lifetime.Dietary factors are associated with risk of some types of cancer, including breast (post-menopausal), endometrial, colon, kidney, mouth, pharynx, larynx, and esophagus.

Osteoporosis

One out of every two women and one in four men ages 50 years and older will have an 20 osteoporosis-related fracture in their lifetime. About 85 to 90 percent of adult bone mass is acquired by the age of 18 in girls and the age 21of 20 in boys.

? Optional Learning Activity

Implement a nutritionally healthy workplace (e.g., form a potluck lunch group that emphasizes health foods; organize an event where people can taste test a variety of healthy foods that they may not have ever eaten before such as kale)

Food Safety Advice

Clean: Wash Hands and Surfaces Often

Bacteria can be spread throughout the kitchen and get onto hands, cutting boards, utensils, counter tops, and food. Wash your hands with warm water and soap for at least 20 seconds before and after handling food and after using the bathroom or changing diapers. Wash your hands after playing with pets or visiting petting zoos. Wash your cutting boards, dishes, utensils, and counter tops with hot soapy water after preparing each food item and before you go on to the next food. Consider using paper towels to clean up kitchen surfaces. If you use cloth towels wash them often in the hot cycle of your washing machine. Rinse fresh fruits and vegetables under running tap water, including those with skins and rinds that are not eaten. Rub firm-skinned fruits and vegetables under running tap water or scrub with a clean vegetable brush while rinsing with running tap water. Keep books, backpacks, or shopping bags off the kitchen table or counters where food is prepared or served.

Separate: Don't Cross Contaminate

Cross-contamination is how bacteria can be spread. When handling raw meat, poultry, seafood, and eggs, keep these foods and their juices away from ready-to-eat foods. Always start with a clean scene — wash hands with warm water and soap. Wash cutting boards, dishes, countertops, and utensils with hot soapy water. Separate raw meat, poultry, seafood, and eggs from other foods in your grocery shopping cart, grocery bags, and in your refrigerator. Use one cutting board for fresh produce and a separate one for

raw meat, poultry, and seafood. Use a food thermometer, which measures the internal temperature of cooked meat, poultry, and egg dishes, to make sure that the food is cooked to a safe internal temperature.

Cook: Cook to Proper Temperatures

Food is safely cooked when it reaches a high enough internal temperature to kill the harmful bacteria that cause foodborne illness. Use a food thermometer to measure the internal temperature of cooked foods.

- Use a food thermometer, which measures the internal temperature of cooked meat, poultry, and egg dishes, to make sure that the food is cooked to a safe internal temperature.
- Cook beef roasts and steaks to a safe minimum internal temperature of 145°F. Cook pork to a minimum of 160°F. All poultry should reach a safe minimum internal temperature of 165°F throughout the bird, as measured with a food thermometer.
- Cook ground meat to 160°F. Information from the Centers for Disease Control and Prevention (CDC) links eating undercooked ground beef with a higher risk of illness. Remember, color is not a reliable indicator of doneness. Use a food thermometer to check the internal temperature of your burgers.
- Cook eggs until the yolk and white are firm, not runny. Don't use recipes in which eggs remain raw or only partially cooked. Casseroles and other dishes containing eggs should be cooked to 160°F.
- Cook fish to 145°F or until the flesh is opaque and separates easily with a fork.
- Make sure there are no cold spots in food (where bacteria can survive) when cooking in a microwave oven. For best results, cover food, stir and rotate for even cooking. If there is no turntable, rotate the dish by hand once or twice during cooking.
- Bring sauces, soups and gravy to a boil when reheating. Heat other leftovers thoroughly to 165°F.
- Use microwave-safe cookware and plastic wrap when cooking foods in a microwave oven.

Chill: Refrigerate Promptly!

Refrigerate foods quickly because cold temperatures slow the growth of harmful bacteria. Do not over-stuff the refrigerator. Cold air must circulate to help keep food safe. Keeping a constant refrigerator temperature of 40°F or below is one of the most effective ways to reduce the risk of foodborne illness. Use an appliance thermometer to be sure the temperature is consistently 40°F or below. The freezer temperature should be 0°F or below.

- Refrigerate or freeze meat, poultry, eggs, and other perishables as soon as you get them home from the store.
- Never let raw meat, poultry, eggs, cooked food, or cut fresh fruits or vegetables sit at room temperature more than two hours before putting them in the refrigerator or freezer (one hour when the temperature is above 90°F).
- Never defrost food at room temperature. Food must be kept at a safe temperature during thawing. There are three safe ways to defrost food: in the refrigerator, in cold water, and in the microwave using the defrost setting. Food thawed in cold water or in the microwave should be cooked immediately.
- Always marinate food in the refrigerator.
- Divide large amounts of leftovers into shallow containers for quicker cooling in the refrigerator.
- Use or discard refrigerated food on a regular basis.

Some food is safe without a cold source. Items that don't require refrigeration include whole fruits and vegetables, hard cheese, unopened canned meat and fish, chips, breads, crackers, peanut butter, jelly, mustard, and pickles.

Use an insulated container to keep food like soup, chili, and stew hot. Fill the container with boiling water, let stand for a few minutes, empty, and then put in the piping hot food. Keep the insulated container closed until lunchtime to keep the food hot — 140°F or above.

Sources

Source: Dietary Guidelines for Americans, 2010, http://health.gov/dietaryguidelines/2010.asp

Recommendations for Specific Population Groups: Recommendations for Specific Population Groups, USDA, www.cnpp.usda.gov/DietaryGuidelines.htm

Diet-related Chronic Disease: Diet-related Chronic Disease, USDA, www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/PolicyDoc/Chapter1.pdf

Food Safety Advice: Food Safety Advice, www.choosemyplate.gov/healthy-eating-tips/food-safety-advice.html

Exercise 2.1.1

1. What is the primary role of carbohydrates in the body?
2. Describe the difference between saturated and unsaturated fats.
3. Why are proteins essential for the human body?

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2.2: Myths and Misconceptions about Nutrition

Lose 30 pounds in 30 days!

Eat as much as you want and still lose weight!

Try the thigh buster and lose inches fast!

And so on, and so on. With so many products and weight-loss theories out there, it is easy to get confused.

Read the following Myths and Facts to help clear up confusion about weight loss, nutrition, and physical activity.

Myth: Fad diets work for permanent weight loss.

Fact: Fad diets are not the best way to lose weight and keep it off. Fad diets often promise quick weight loss or tell you to cut certain foods out of your diet. You may lose weight at first on one of these diets. But diets that strictly limit calories or food choices are hard to follow. Most people quickly get tired of them and regain any lost weight. Fad diets may be unhealthy because they may not provide all of the nutrients your body needs. Also, losing weight at a very rapid rate (more than 3 pounds a week after the first couple of weeks) may increase your risk for developing gallstones (clusters of solid material in the gallbladder that can be painful). Diets that provide less than 800 calories per day also could result in heart rhythm abnormalities, which can be fatal. Research suggests that losing 1/2 to 2 pounds a week by making healthy food choices, eating moderate portions, and building physical activity into your daily life is the best way to lose weight and keep it off. By adopting healthy eating and physical activity habits, you may also lower your risk for developing type 2 diabetes, heart disease, and high blood pressure.

Myth: High-protein or low-carbohydrate diets are a healthy way to lose weight.

Fact: The long-term health effects of a high-protein/low-carbohydrate diet are unknown. But getting most of your daily calories from high-protein foods like meat, eggs, and cheese is not a balanced eating plan. You may be eating too much fat and cholesterol, which may raise heart disease risk. You may be eating too few fruits, vegetables, and whole grains, which may lead to constipation due to lack of dietary fiber. Following a high-protein/low-carbohydrate diet may also make you feel nauseous, tired, and weak. Eating fewer than 130 grams of carbohydrate a day can lead to the buildup of ketones in your blood. Ketones are partially broken-down fats. A buildup of these in your blood (called ketosis) can cause your body to produce high levels of uric acid, which is a risk factor for gout (a painful swelling of the joints) and kidney stones. Ketosis may be especially risky for pregnant women and people with diabetes or kidney disease. Be sure to discuss any changes in your diet with a health care professional, especially if you have health conditions such as cardiovascular disease, kidney disease, or type 2 diabetes.

Tip: High-protein/low-carbohydrate diets are often low in calories because food choices are strictly limited, so they may cause short-term weight loss. But a reduced-calorie eating plan that includes recommended amounts of carbohydrate, protein, and fat will also allow you to lose weight. By following a balanced eating plan, you will not have to stop eating whole classes of foods, such as whole grains, fruits, and vegetables—and miss the key nutrients they contain. You may also find it easier to stick with a diet or eating plan that includes a greater variety of foods.

Myth: Starches are fattening and should be limited when trying to lose weight.

Fact: Many foods high in starch, like bread, rice, pasta, cereals, beans, fruits, and some vegetables (like potatoes and yams) are low in fat and calories. They become high in fat and calories when eaten in large portion sizes or when covered with high-fat toppings like butter, sour cream, or mayonnaise. Foods high in starch (also called complex carbohydrates) are an important source of energy for your body.

Tip: A healthy eating plan includes the following elements:

- It emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products.
- It includes lean meats, poultry, fish, beans, eggs, and nuts.
- It is low in saturated fats, *trans* fat, cholesterol, salt (sodium), and added sugars.

Myth: Certain foods, like grapefruit, celery, or cabbage soup, can burn fat and make you lose weight.

Fact: No foods can burn fat. Some foods with caffeine may speed up your metabolism (the way your body uses energy, or calories) for a short time, but they do not cause weight loss.

Tip: The best way to lose weight is to cut back on the number of calories you eat and be more physically active.

Myth: Natural or herbal weight-loss products are safe and effective.

Fact: A weight-loss product that claims to be natural or herbal is not necessarily safe. These products are not usually scientifically tested to prove that they are safe or that they work. For example, herbal products containing ephedra (now banned by the U.S. Government) have caused serious health problems and even death. Newer products that claim to be ephedra-free are not necessarily danger-free, because they may contain ingredients similar to ephedra.

Tip: Talk with your health care provider before using any weight-loss product. Some natural or herbal weight-loss products can be harmful.

Myth: I can lose weight while eating whatever I want.

Fact: To lose weight, you need to use more calories than you eat. It is possible to eat any kind of food you want and lose weight. You need to limit the number of calories you eat every day and/or increase your daily physical activity. Portion control is the key. Try eating smaller amounts of food and choosing foods that are low in calories.

Tip: When trying to lose weight, you can still eat your favorite foods—as long as you pay attention to the **total number of calories** that you eat.

Myth: Low-fat or fat-free means no calories.

Fact: A low-fat or fat-free food *is* often lower in calories than the same size portion of the full-fat product. But many processed low-fat or fat-free foods have just as many calories as the full-fat versions of the same foods or even more calories. They may contain added sugar, flour, or starch thickeners to improve flavor and texture after fat is removed. These ingredients add calories. Myth: Fast foods are always an unhealthy choice and you should not eat them when dieting.

Fact: Fast foods can be part of a healthy weight-loss program with a little bit of know-how.

Tip: Avoid supersized combo meals, or split one with a friend. Sip on water or fat-free milk instead of soda. Choose salads and grilled foods, like a grilled chicken breast sandwich or small hamburger. Try a “fresco” taco (with salsa instead of cheese or sauce) at taco stands. Fried foods, like french fries and fried chicken, are high in fat and calories, so order them only once in a while, order a small portion, or split an order with a friend. Also, use only small amounts of high-fat, high-calorie toppings, like regular mayonnaise, salad dressings, bacon, and cheese.

Myth: Skipping meals is a good way to lose weight.

Fact: Studies show that people who skip breakfast and eat fewer times during the day tend to be heavier than people who eat a healthy breakfast and eat four or five times a day. This may be because people who skip meals tend to feel hungrier later on, and eat more than they normally would. It may also be that eating many small meals throughout the day helps people control their appetites.

Tip: Eat small meals throughout the day that include a variety of healthy, low-fat, low-calorie foods.

Myth: Eating after 8 p.m. causes weight gain.

Fact: It does not matter what time of day you eat. It is what and how much you eat and how much physical activity you do during the whole day that determines whether you gain, lose, or maintain your weight. No matter when you eat, your body will store extra calories as fat.

Tip: If you want to have a snack before bedtime, think first about how many calories you have eaten that day. And try to avoid snacking in front of the TV at night—it may be easier to overeat when you are distracted by the television.

Myth: Nuts are fattening and you should not eat them if you want to lose weight.

Fact: In small amounts, nuts can be part of a healthy weight-loss program. Nuts are high in calories and fat. However, most nuts contain healthy fats that do not clog arteries. Nuts are also good sources of protein, dietary fiber, and minerals including magnesium and copper.

Tip: Enjoy small portions of nuts. One-half ounce of mixed nuts has about 84 calories.

Myth: Eating red meat is bad for your health and makes it harder to lose weight.

Fact: Eating lean meat in small amounts can be part of a healthy weight-loss plan. Red meat, pork, chicken, and fish contain some cholesterol and saturated fat (the least healthy kind of fat). They also contain healthy nutrients like protein, iron, and zinc.

Tip: Choose cuts of meat that are lower in fat and trim all visible fat. Lower fat meats include pork tenderloin and beef round steak, tenderloin, sirloin tip, flank steak, and extra lean ground beef. Also, pay attention to portion size. Three ounces of meat or poultry is the size of a deck of cards.

Myth: Dairy products are fattening and unhealthy.

Fact: Low-fat and fat-free milk, yogurt, and cheese are just as nutritious as whole-milk dairy products, but they are lower in fat and calories. Dairy products have many nutrients your body needs. They offer protein to build muscles and help organs work properly, and calcium to strengthen bones. Most milk and some yogurt are fortified with vitamin D to help your body use calcium.

Tip: If you cannot digest lactose (the sugar found in dairy products), choose low-lactose or lactose-free dairy products, or other foods and beverages that offer calcium and vitamin D (listed below).

- **Calcium:** soy-based beverage or tofu made with calcium sulfate; canned salmon; dark leafy greens like collards or kale
- **Vitamin D:** soy-based beverage or cereal (getting some sunlight on your skin also gives you a small amount of vitamin D)

Myth: “Going vegetarian” means you are sure to lose weight and be healthier.

Fact: Research shows that people who follow a vegetarian eating plan, on average, eat fewer calories and less fat than nonvegetarians. They also tend to have lower body weights relative to their heights than nonvegetarians. Choosing a vegetarian eating plan with a low fat content may be helpful for weight loss. But vegetarians—like nonvegetarians—can make food choices that contribute to weight gain, like eating large amounts of high-fat, high-calorie foods or foods with little or no nutritional value. Vegetarian diets should be as carefully planned as nonvegetarian diets to make sure they are balanced. Nutrients that nonvegetarians normally get from animal products, but that are not always found in a vegetarian eating plan, are iron, calcium, vitamin D, vitamin B12, zinc, and protein.

Tip: Choose a vegetarian eating plan that is low in fat and that provides all of the nutrients your body needs. Food and beverage sources of nutrients that may be lacking in a vegetarian diet are listed below.

- **Iron:** cashews, spinach, lentils, garbanzo beans, fortified bread or cereal
- **Calcium:** dairy products, fortified soy-based beverages, tofu made with calcium sulfate, collard greens, kale, broccoli
- **Vitamin D:** fortified foods and beverages including milk, soy-based beverages, or cereal Vitamin B12 eggs, dairy products, fortified cereal or soy-based beverages, tempeh, miso (tempeh and miso are foods made from soybeans)
- **Protein:** eggs, dairy products, beans, peas, nuts, seeds, tofu, tempeh, soy-based burgers

Sources

Source: Weight-loss and Nutrition Myths, NIDDK, NIH, win.niddk.nih.gov/publications/myths.htm

? Exercise 2.2.1

1. Name one common myth about carbohydrates and explain the truth.
2. Why is it important to question nutrition information from unreliable sources?
3. How can misinformation about diets impact health?

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2.3: Ethnic Foods

Tipsheet: Eating Healthy Ethnic Food

Trying different ethnic cuisines to give yourself a taste treat is possible while counting calories and fat. Many ethnic cuisines offer lots of low-fat, low-calorie choices.

So if you want to eat healthy and still have lots of different choices, take a taste adventure with ethnic foods. Here's a sample of healthy food choices (lower in calories and fat) and terms to look for when making your selection:

Chinese

- Zheng (steamed)
- Jum (poached)
- Kao (roasted)
- Shao (barbecued)
- Steamed rice
- Dishes without MSG added

Italian

- Red sauces
- Primavera (no cream)
- Piccata (lemon)
- Sun-dried tomatoes
- Crushed tomatoes
- Lightly sauteed
- Grilled

Mexican

- Spicy chicken
- Rice and black beans
- Salsa or picante
- Soft corn tortillas

Filipino

- Adobo
- Lumpia
- Pancit
- Bagoong
- Sinigang

Japanese

- Sukiyaki
- Teriyaki
- Shabu-Shabu
- Sushi
- Tempura

Indian

- Chicken Tikka Masala
- Curry
- Kebab

Mediterranean

- Salad
- Yogurt
- Meze
- Hummus
- Falafel

United States

- Biscuits and Gravy
- Open faced burgers
- Pot Roast
- Tuna Noodle Casserole

? Learning Activity

Try some of the healthy food recipes in these cookbooks –

- **Heart Healthy Home Cooking African American Style—With Every Heartbeat is Life:** Prepare your favorite African American dishes in ways that protect you and your family from heart disease and stroke. This cookbook provides recipes for 26 tested and tasty favorite African American dishes. Recipes give nutrient analyses that include carbohydrates and protein. Also covers heart healthy food substitutions and food safety.
- **Delicious Heart Healthy Latino Recipes:** Provides recipes for 26 popular easy to prepare taste-tested Latino dishes created in a heart healthy style (lower in fat and sodium than traditional versions). Includes heart healthy food substitutions, food safety, a glossary of international terms

Sources

Tipsheet: Eating Healthy Ethnic Food: Eating Healthy Ethnic Food, NHIBI, NIH, http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/eth_dine.htm

? Exercise 2.3.1

1. How can traditional ethnic foods contribute to a balanced diet?
2. Give an example of a nutrient commonly found in ethnic diets.
3. Why is it important to respect cultural food practices in nutrition counseling?

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2.4: Dietary Supplements

What are the benefits and risks of dietary supplements?

Many people take dietary supplements in an effort to be well and stay healthy. With so many dietary supplements available and so many claims made about their health benefits, how can a consumer decide what's safe and effective? This fact sheet provides a general overview of dietary supplements, discusses safety considerations, and suggests sources for additional information.

? Key Points

- Federal regulations for dietary supplements are very different from those for prescription and over-the-counter drugs. For example, a dietary supplement manufacturer does not have to prove a product's safety and effectiveness before it is marketed.
- If you are thinking about using a dietary supplement, first get information on it from reliable sources. Keep in mind that dietary supplements may interact with medications or other dietary supplements and may contain ingredients not listed on the label.
- Tell your health care providers about any complementary and alternative practices you use, including dietary supplements. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care.

About Dietary Supplements

Dietary supplements were defined in a law passed by Congress in 1994 called the Dietary Supplement Health and Education Act (DSHEA). According to DSHEA, a dietary supplement is a product that:

- Is intended to supplement the diet
- Contains one or more dietary ingredients (including vitamins, minerals, herbs or other botanicals, amino acids, and certain other substances) or their constituents
- Is intended to be taken by mouth, in forms such as tablet, capsule, powder, softgel, gelcap, or liquid
- Is labeled as being a dietary supplement.

Herbal supplements are one type of dietary supplement. An herb is a plant or plant part (such as leaves, flowers, or seeds) that is used for its flavor, scent, and/or therapeutic properties. "Botanical" is often used as a synonym for "herb." An herbal supplement may contain a single herb or mixtures of herbs.

Research has shown that some uses of dietary supplements are effective in preventing or treating diseases. For example, scientists have found that folic acid (a vitamin) prevents certain birth defects, and a regimen of vitamins and zinc can slow the progression of the age- related eye disease macular degeneration. Also, calcium and vitamin D supplements can be helpful in preventing and treating bone loss and osteoporosis (thinning of bone tissue).

Research has also produced some promising results suggesting that other dietary supplements may be helpful for other health conditions (e.g., omega-3 fatty acids for coronary disease), but in most cases, additional research is needed before firm conclusions can be drawn.

Dietary Supplement Use in the United States

A national survey conducted in 2007 found that 17.7 percent of American adults had used "natural products" (i.e., dietary supplements other than vitamins and minerals) in the past 12 months. The most popular products used by adults for health reasons in the past 30 days were fish oil/omega 3/DHA (37.4 percent), glucosamine (19.9 percent), echinacea (19.8 percent), flaxseed oil or pills (15.9 percent), and ginseng (14.1 percent). In another, earlier national survey covering all types of dietary supplements, approximately 52 percent of adult respondents said they had used some type of supplement in the last 30 days; the most commonly reported were multivitamins/multiminerals (35 percent), vitamins E and C (12–13 percent), calcium (10 percent), and B-complex vitamins (5 percent).

Federal Regulation of Dietary Supplements

The Federal Government regulates dietary supplements through the U.S. Food and Drug Administration (FDA). The regulations for dietary supplements are not the same as those for prescription or over-the-counter drugs. In general, the regulations for dietary supplements are less strict.

- A manufacturer does not have to prove the safety and effectiveness of a dietary supplement before it is marketed. A manufacturer is permitted to say that a dietary supplement addresses a nutrient deficiency, supports health, or is linked to a particular body function (e.g., immunity), if there is research to support the claim. Such a claim must be followed by the words "This statement has not been evaluated by the U.S. Food and Drug Administration (FDA). This product is not intended to diagnose, treat, cure, or prevent any disease."
- Manufacturers are expected to follow certain "good manufacturing practices" (GMPs) to ensure that dietary supplements are processed consistently and meet quality standards. Requirements for GMPs went into effect in 2008 for large manufacturers and are being phased in for small manufacturers through 2010.
- Once a dietary supplement is on the market, the FDA monitors safety. If it finds a product to be unsafe, it can take action against the manufacturer and/or distributor, and may issue a warning or require that the product be removed from the marketplace.

Also, once a dietary supplement is on the market, the FDA monitors product information, such as label claims and package inserts. The Federal Trade Commission (FTC) is responsible for regulating product advertising; it requires that all information be truthful and not misleading.

The Federal Government has taken legal action against a number of dietary supplement promoters or Web sites that promote or sell dietary supplements because they have made false or deceptive statements about their products or because marketed products have proven to be unsafe.

Sources of Science-Based Information for Dietary Supplements

It's important to look for reliable sources of information on dietary supplements so you can evaluate the claims that are made about them. The most reliable information on dietary supplements is based on the results of rigorous scientific testing.

To get reliable information on a particular dietary supplement:

- Ask your health care providers. Even if they do not know about a specific dietary supplement, they may be able to access the latest medical guidance about its uses and risks.
- Look for scientific research findings on the dietary supplement. The National Center for Complementary and Alternative Medicine (NCCAM) and the National Institutes of Health (NIH) Office of Dietary Supplements (ODS), as well as other Federal agencies, have free publications, clearinghouses, and information on their Web sites.

Safety Considerations of Dietary Supplements

If you are thinking about or are using a dietary supplement, here are some points to keep in mind.
Tell your health care providers about any complementary and alternative practices you use, including dietary supplements. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care. For tips about talking with your health care providers about complementary and alternative medicine (CAM), see NCCIH's "Be an Informed Consumer" page.

It is especially important to talk to your health care provider if you are

- Thinking about replacing your regular medication with one or more dietary supplements.
- Taking any medications (whether prescription or over-the-counter), as some dietary supplements have been found to interact with medications.
- Planning to have surgery. Certain dietary supplements may increase the risk of bleeding or affect the response to anesthesia.
- Pregnant or nursing a baby, or are considering giving a child a dietary supplement. Most dietary supplements have not been tested in pregnant women, nursing mothers, or children.

If you are taking a dietary supplement, **read the label instructions.** Talk to your health care provider if you have any questions, particularly about the best dosage for you to take. If you experience any side effects that concern you, stop taking the dietary

supplement, and contact your health care provider.

Keep in mind that although many dietary supplements (and some prescription drugs) come from natural sources, **“natural” does not always mean “safe.”** For example, the herbs comfrey and kava can cause serious harm to the liver. Also, a manufacturer’s use of the term “standardized” (or “verified” or “certified”) does not necessarily guarantee product quality or consistency.

Be aware that **an herbal supplement may contain dozens of compounds** and that its active ingredients may not be known. Researchers are studying many of these products in an effort to identify active ingredients and understand their effects in the body. Also consider the possibility that what’s on the label may not be what’s in the bottle. Analyses of dietary supplements sometimes find differences between labeled and actual ingredients.

For example:

- An herbal supplement may not contain the correct plant species.
- The amount of the active ingredient may be lower or higher than the label states. That means you may be taking less—or more—of the dietary supplement than you realize.
- The dietary supplement may be contaminated with other herbs, pesticides, or metals, or even adulterated with unlabeled ingredients such as prescription drugs.

Learning Activity

Watch this short video from the U.S. Food and Drug Administration, Warning on Body Building Products:



Optional Video: Dietary Supplements: Health or Hype?

Much of the information provided in Chapter 6, Lesson 4: Dietary Supplements is also presented in a 16 minute video titled: Dietary Supplements: Health or Hype?

- “Walk down the aisle of any supermarket or pharmacy and you are bound to be confronted by shelves full of nutrient supplements, from vitamin A to zinc. But are they worth the staggering prices many people pay for them? What exactly are supplements, and when should they be avoided? This program looks at a wide range of supplements that are currently available and examines their potential impact on elderly consumers, high performance athletes, and pregnant women. Also spotlighting issues of product labeling and celebrity endorsement, this is a much-needed look at an industry which, despite public concerns, is only getting bigger.” (from Films Media Group, 1994. Films On Demand,© 2011)

To view this video:

1. Click on Dietary Supplements: Health or Hype?
2. Enter your Foothill College Student ID Number

3. Click on Login

- Click on the Expand icon (left of Speaker Volume icon) to expand the image to fill the screen.
- Click on the Play button in the center of the screen or in the bottom left corner.
- At any time you can press the ESC key on your computer to return to the browser window or you can move your cursor to the bottom of the screen to make the toolbar visible again; then you can pause or adjust the volume.
- Closed captioning is available for this video. You'll see a "Turn CC On" button in the upper right hand of the video player. Click on this button to toggle captions on/off

Sources

Source: *Wise Use, NCCAM, NIH, http://nccam.nih.gov/health/supplements/wiseuse.htm*

? Exercise 2.4.1

1. What is one reason people might choose to take dietary supplements?
2. Why should dietary supplements be used with caution?
3. How can supplements affect the effectiveness of prescription medications?

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2.5: Body Composition

Body Mass Index (BMI)

BMI is a useful measure of overweight and obesity. It is calculated from your height and weight. BMI is an estimate of body fat and a good gauge of your risk for diseases that can occur with more body fat. The higher your BMI, the higher your risk for certain diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers.

Although BMI can be used for most men and women, it does have some limits:

- It may overestimate body fat in athletes and others who have a muscular build.
- It may underestimate body fat in older persons and others who have lost muscle.

How is obesity measured?

Measuring the exact amount of a person's body fat is not easy. The most accurate measures are to weigh a person underwater or in a chamber that uses air displacement to measure body volume, or to use an X-ray test called Dual Energy X-ray Absorptiometry, also known as DEXA. These methods are not practical for the average person, and are done only in research centers with special equipment.

There are simpler methods to estimate body fat. One is to measure the thickness of the layer of fat just under the skin in several parts of the body. Another involves sending a harmless amount of electricity through a person's body. Results from these methods, however, can be inaccurate if done by an inexperienced person or on someone with extreme obesity.

Because measuring a person's body fat is difficult, health care professionals often rely on other means to diagnose obesity. Weight-for-height tables, used for decades, have a range of acceptable weights for a person of a given height. One problem with these tables is that there are many versions, all with different weight ranges. Another problem is that they do not distinguish between excess fat and muscle. According to the tables, a very muscular person may be classified obese when he or she is not. The Body Mass Index (BMI) is less likely to misidentify a person's appropriate weight-for-height range.

Body Mass Index

The BMI is a tool used to assess overweight and obesity and monitor changes in body weight. Like the weight-for-height tables, BMI has its limitations because it does not measure body fat or muscle directly. It is calculated by dividing a person's weight in pounds by height in inches squared and multiplied by 703.

Men and women can have the same BMI but different body fat percentages. As a rule, women usually have more body fat than men. A bodybuilder with a large muscle mass and low percentage of body fat may have the same BMI as a person who has more body fat. However, a BMI of 30 or higher usually indicates excess body fat.

A BMI of 25 to 29.9 is considered overweight. A person with a BMI of 30 or higher is considered obese. Please review your findings with your health care provider if your BMI is outside of the normal range.

Waist Circumference

Measuring waist circumference helps screen for possible health risks that come with overweight and obesity. If most of your fat is around your waist rather than at your hips, you're at a higher risk for heart disease and type 2 diabetes. This risk goes up with a waist size that is greater than 35 inches for women or greater than 40 inches for men. To correctly measure your waist, stand and place a tape measure around your middle, just above your hipbones. Measure your waist just after you breathe out.

The table Risks of Obesity-Associated Diseases by BMI and Waist Circumference provides you with an idea of whether your BMI combined with your waist circumference increases your risk for developing obesity-associated diseases or conditions.

Body Fat Distribution

Health care professionals are concerned not only with how much fat a person has, but also where the fat is located on the body. Women typically collect fat in their hips and buttocks, giving them a "pear" shape. Men usually build up fat around their bellies,

giving them more of an “apple” shape. Of course, some men are pear-shaped and some women become apple-shaped, especially after menopause.

Excess abdominal fat is an important, independent risk factor for disease. Research has shown that waist circumference is directly associated with abdominal fat and can be used in the assessment of the risks associated with obesity or overweight. If you carry fat mainly around your waist, you are more likely to develop obesity-related health problems.

Women with a waist measurement of more than 35 inches and men with a waist measurement of more than 40 inches may have more health risks than people with lower waist measurements because of their body fat distribution.

? Learning Activity

The BMI Calculator is an easy-to-use online tool to help you estimate body fat. The higher your BMI, the higher your risk of obesity-related disease.

Use the BMI Calculator or BMI Tables to estimate your body fat. The BMI score means the following:

BMI Score	
Underweight	Below 18.5
Normal	18.5–24.9
Overweight	25.0–29.9
Obesity	30.0 and Above

Sources

Body Mass Index (BMI): Assessing Your Weight and Health Risk, NHIBI, NIH, http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/risk.htm

How is obesity measured?: Understanding Adult Obesity, WIN, NIDDK, NIH, win.niddk.nih.gov/publications/understanding.htm

? Exercise 2.5.1

1. What is meant by “body composition”?
2. Why is it important to assess body composition rather than just body weight?
3. Name one method used to measure body composition.

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2.6: Obesity

Overweight and obesity is a serious health problem that affects millions of Americans. These conditions substantially increase the risk of morbidity from hypertension; dyslipidemia; type 2 diabetes; coronary heart disease; stroke; gallbladder disease; osteoarthritis; sleep apnea and respiratory problems; and endometrial, breast, prostate, and colon cancers. Higher body weights also are associated with increases in all-cause mortality.

Adults

According to the National Health and Nutrition Examination Survey (NHANES) data from 2007–08, the overall prevalence of overweight and obesity for adults was 68 percent (approximately 72 percent among men and 64 percent among women).

- Among women, the overall prevalence of obesity was 35.5 percent.
- Among men, the overall prevalence of obesity was 32.2 percent.

Children and Teens

This rate, though, remains alarmingly high. Statistics show about 17 percent of American children ages 2 to 19, or 1 in 6, are obese. Further, the latest data continue to suggest that overweight and obesity are having a greater effect on minorities, including blacks and Hispanics.

Understanding Adult Obesity

Today, 66 percent of adults in the United States are considered overweight or obese. Obesity puts people at increased risk for chronic diseases such as heart disease, type 2 diabetes, high blood pressure, stroke, and some forms of cancer.

The large number of people considered to be obese and the serious health risks that come with it make understanding its causes and treatment crucial. This fact sheet provides basic information about obesity: What is it? How is it measured? What causes it? What are the health risks? What can you do about it?

What is obesity? Obesity specifically refers to an excessive amount of body fat. “Overweight” refers to an excessive amount of body weight that includes muscle, bone, fat, and water. There are few studies in humans that link direct measurements of total body fat to morbidity and mortality. There are also no official standards identified by the National Institutes of Health (NIH) that define obesity based on the amount or percentage of a person’s total body fat.

What causes obesity?

Obesity occurs when a person consumes more calories from food than he or she burns. Our bodies need calories to sustain life and be physically active, but to maintain weight we need to balance the energy we eat with the energy we use. When a person eats more calories than he or she burns, the energy balance is tipped toward weight gain and obesity. This imbalance between calories-in and calories-out may differ from one person to another. Genetic, environmental, and other factors may all play a part.

Genetic Factors

Obesity tends to run in families, suggesting a genetic cause. However, families also share diet and lifestyle habits that may contribute to obesity. Separating genetic from other influences on obesity is often difficult. Even so, science does show a link between obesity and heredity.

Environmental and Social Factors

Environment strongly influences obesity. Consider that most people in the United States alive today were also alive in 1980, when obesity rates were lower. Since this time, our genetic make-up has not changed, but our environment has.

Environment includes lifestyle behaviors such as what a person eats and his or her level of physical activity. Too often Americans eat out, consume large meals and high-fat foods, and put taste and convenience ahead of nutrition. Also, most people in the United States do not get enough physical activity.

Environment also includes the world around us—our access to places to walk and healthy foods, for example. Today, more people drive long distances to work instead of walking, live in neighborhoods without sidewalks, tend to eat out or get “take out” instead

of cooking, or have vending machines with high-calorie, high-fat snacks at their workplace. Our environment often does not support healthy habits.

In addition, social factors including poverty and a lower level of education have been linked to obesity. One reason for this may be that high-calorie processed foods cost less and are easier to find and prepare than healthier foods, such as fresh vegetables and fruits. Other reasons may include inadequate access to safe recreation places or the cost of gym memberships, limiting opportunities for physical activity. However, the link between low socioeconomic status and obesity has not been conclusively established, and recent research shows that obesity is also increasing among high-income groups.

Cultural Factors

An individual's cultural background may also play a role in his or her weight. For instance, foods specific to certain cultures that are prepared with a lot of fat or salt may hamper one's weight-loss efforts. Similarly, family gatherings offering large amounts of food may make it difficult to pay attention to proper portion control and serving sizes. Lastly, research has shown that individuals originally from countries other than the United States have difficulty adjusting to the calorie-rich foods offered here. These individuals may not be able to prepare food with the ingredients they would use in their native countries.

Although you cannot change your genetic makeup, you can work on changing your eating habits, levels of physical activity, and other environmental factors. Try these ideas:

- Learn to choose sensible portions of nutritious meals that are lower in fat.
- Learn healthier ways to make your favorite foods.
- Learn to recognize and control environmental cues (like inviting smells or a package of cookies on the counter) that make you want to eat when you are not hungry.
- Have a healthy snack an hour or two before a social gathering to prevent overeating. Mingle and talk between bites to prevent eating too much too quickly.
- Engage in at least 30 minutes of moderate-intensity physical activity (like brisk walking) on most, preferably all, days of the week.
- Take a walk instead of watching television.
- Eat meals and snacks at a table, not in front of the TV.
- Pay attention to why you are eating. Determine if you are eating because you are actually hungry or because you are bored, depressed, or lonely.
- Keep records of your food intake and physical activity.

Other Causes of Obesity

Some illnesses may lead to or are associated with weight gain or obesity. These include:

- Hypothyroidism, a condition in which the thyroid gland fails to produce enough thyroid hormone. It often results in lowered metabolic rate and loss of vigor.
- Cushing's syndrome, a hormonal disorder caused by prolonged exposure of the body's tissues to high levels of the hormone cortisol. Symptoms vary, but most people have upper body obesity, rounded face, increased fat around the neck, and thinning arms and legs.
- Polycystic ovary syndrome, a condition characterized by high levels of androgens (male hormone), irregular or missed menstrual cycles, and in some cases, multiple small cysts in the ovaries. Cysts are fluid-filled sacs.

A doctor can tell whether there are underlying medical conditions that are causing weight gain or making weight loss difficult.

Lack of sleep may also contribute to obesity. Recent studies suggest that people with sleep problems may gain weight over time. On the other hand, obesity may contribute to sleep problems due to medical conditions such as sleep apnea, where a person briefly stops breathing at multiple times during the night. (Visit Health Risks for more information on the relationship between sleep apnea and obesity.) You may wish to talk with your health care provider if you have difficulty sleeping.

Certain drugs such as steroids, some antidepressants, and some medications for psychiatric conditions or seizure disorders may cause weight gain. These drugs may slow the rate at which the body burns calories, stimulate appetite, or cause the body to hold on to extra water. Be sure your doctor knows all the medications you are taking (including over-the-counter medications and dietary supplements). He or she may recommend a different medication that has less effect on weight gain.

What are the consequences of obesity?

Health Risks

Obesity is more than a cosmetic problem. Many serious medical conditions have been linked to obesity, including type 2 diabetes, heart disease, high blood pressure, and stroke. Obesity is also linked to higher rates of certain types of cancer. Esophageal cancer has also been associated with obesity.

- Men who are considered obese are more likely than nonobese men to develop cancer of the colon, rectum, or prostate.
- Women who are considered obese are more likely than nonobese women to develop cancer of the gallbladder, uterus, cervix, or ovaries.

Other diseases and health problems linked to obesity include:

- Gallbladder disease and gallstones.
- Fatty liver disease (also called nonalcoholic steatohepatitis or NASH).
- Gastroesophageal reflux, or what is sometimes called GERD. This problem occurs when the lower esophageal sphincter does not close properly and stomach contents leak back—or reflux—into the esophagus.
- Osteoarthritis, a disease in which the joints deteriorate. This is possibly the result of excess weight on the joints.
- Gout, another disease affecting the joints.
- Pulmonary (breathing) problems, including sleep apnea, which causes a person to stop breathing for a short time during sleep.
- Reproductive problems in women, including menstrual irregularities and infertility.

Health care professionals generally agree that the more obese a person is, the more likely he or she is to develop health problems.

Emotional suffering may be one of the most painful parts of obesity. American society emphasizes physical appearance and often equates attractiveness with slimness, especially for women. Such messages may make people considered overweight feel unattractive.

Many people think that individuals who are considered obese are gluttonous, lazy, or both. This is not true. As a result, people who are considered obese often face prejudice or discrimination in the job market, at school, and in social situations. Feelings of rejection, shame, or depression may occur.

Risk Factors for Health Associated With Obesity

Along with being overweight or obese, the following conditions will put you at greater risk for heart disease and other conditions:

- High blood pressure (hypertension)
- High LDL cholesterol (“bad” cholesterol)
- High triglycerides
- Family history of premature heart disease
- Physical inactivity
- Cigarette smoking

For people who are considered obese (BMI greater than or equal to 30) or those who are overweight (BMI of 25 to 29.9) and have two or more risk factors, it is recommended that you lose weight. Even a small weight loss (between 5 and 10 percent of your current weight) will help lower your risk of developing diseases associated with obesity. People who are overweight, do not have a high waist measurement, and have fewer than two risk factors may need to prevent further weight gain rather than lose weight.

Talk to your doctor to see whether you are at an increased risk and whether you should lose weight. Your doctor will evaluate your BMI, waist measurement, and other risk factors for heart disease.

How is obesity treated?

The method of treatment depends on your level of obesity, overall health condition, and readiness to lose weight. Treatment may include a combination of diet, exercise, behavior modification, and sometimes weight-loss drugs. In some cases of extreme obesity, bariatric surgery may be recommended. (Visit NIDDK for more information on bariatric surgery.)

Remember, weight control is a life-long effort, and having realistic expectations about weight loss is an important consideration. Eating healthier foods and getting at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week have important health benefits. Sixty minutes of physical activity a day may be required to prevent gradual weight gain in adulthood. Individuals who were previously considered overweight and obese individuals are encouraged to get 60 to 90 minutes of exercise a day to sustain weight loss.

Although most adults do not need to see their health care professional before starting a moderate-intensity physical activity program, men older than 40 years and women older than 50 years who plan a vigorous program, or who have either chronic disease or risk factors for chronic illnesses, should speak with their health care provider before starting a physical activity program.

Stigma of Obesity

What is your reaction to this photo of a man and girl at the beach? Compassion? Fear? Disgust? Many people will look at this picture and make negative assumptions about the man based on his weight. According to a study from the Yale Rudd Center for Food Policy and Obesity, large people are the object of "widespread negative stereotypes that overweight and obese persons are lazy, unmotivated, lacking in self-discipline, less competent, noncompliant, and sloppy" (Puhl and Heuer 2009).

Historically, both in the United States and elsewhere, it was considered acceptable to discriminate against people based on prejudiced opinions. Even after slavery was abolished in 1865, the next 100 years of American history saw institutionalized racism and prejudice against black people. In an example of stereotype interchangeability, the same insults that are flung today at the overweight and obese population (lazy, for instance), have been flung at various racial and ethnic groups in earlier history. Of course, no one gives voice to these kinds of views in public now, except when talking about obese people.Why is it considered acceptable to feel prejudice toward—even to hate—obese people? Puhl and Heuer suggest that these feelings stem from the perception that obesity is preventable through self-control, better diet, and more exercise. Highlighting this contention is the fact that studies have shown that people's perceptions of obesity are more positive when they think the obesity was caused by non-controllable factors like biology (a thyroid condition, for instance) or genetics.

Even with some understanding of non-controllable factors that might affect obesity, obese people are still subject to stigmatization. Puhl and Heuer's study is one of many that document discrimination at work, in the media, and even in the medical profession. Obese people are less likely to get into college than thinner people, and they are less likely to succeed at work.

Stigmatization of obese people comes in many forms, from the seemingly benign to the potentially illegal. In movies and television show, overweight people are often portrayed negatively, or as stock characters who are the butt of jokes. One study found that in children's movies "obesity was equated with negative traits (evil, unattractive, unfriendly, cruel) in 64 percent of the most popular children's videos. In 72 percent of the videos, characters with thin bodies had desirable traits, such as kindness or happiness" (Hines and Thompson 2007). In movies and television for adults, the negative portrayal is often meant to be funny. "Fat suits"—inflatable suits that make people look obese—are commonly used in a way that perpetuates negative stereotypes. Think about the way you have seen obese people portrayed in movies and on television; now think of any other subordinate group being openly denigrated in such a way. It is difficult to find a parallel example.

Sources

Source: Information for Health Professionals, NHLBI, NIH, http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/profmats.htm

Understanding Adult Obesity: Understanding Adult Obesity, WIN, NIDDK, NIH, win.niddk.nih.gov/publications/understanding.htm

How is obesity treated?: Understanding Adult Obesity, NIDDK, NIH, win.niddk.nih.gov/publications/PDFs/understandingobesityrev.pdf

Stigma of Obesity: OpenStax College. Health in the United States. Connexions, May 18, 2012. http://cnx.org/content/m42931/1.2/

Exercise 2.6.1

1. What are two health risks associated with obesity?
2. Explain one factor that can contribute to obesity.
3. How does obesity affect metabolic health?

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2.7: Diet and Weight Control

Who should lose weight?

Health care professionals generally agree that people who have a BMI of 30 or greater can improve their health through weight loss.This is especially true for people with a BMI of 40 or greater, who are considered extremely obese.

Preventing additional weight gain is recommended if you have a BMI between 25 and 29.9, unless you have other risk factors for obesity-related diseases. Obesity experts recommend you try to lose weight if you have two or more of the following:

- **Family history of certain chronic diseases.** If you have close relatives who have had heart disease or diabetes, you are more likely to develop these problems if you are obese.
- **Preexisting medical conditions.** High blood pressure, high LDL cholesterol levels, low HDL cholesterol levels, high triglycerides, and high blood glucose are all warning signs of some obesity-associated diseases.
- **Large waist circumference.** Men who have waist circumferences greater than 40 inches, and women who have waist circumferences greater than 35 inches, are at higher risk of diabetes, dyslipidemia (abnormal amounts of fat in the blood), high blood pressure, and heart disease.

Fortunately, a weight loss of 5 to 10 percent of your initial body weight can do much to improve health by lowering blood pressure and other risk factors for obesity-related diseases. In addition, research shows that a 5- to 7-percent weight loss brought about by moderate diet and exercise can delay or possibly prevent type 2 diabetes in people at high risk for the disease. In a recent study, participants who were considered overweight and had pre-diabetes—a condition in which a person's blood glucose level is higher than normal, but not high enough to be classified as diabetes—were able to delay or prevent the onset of type 2 diabetes by adopting a low-fat, low-calorie diet and exercising for 30 minutes a day, 5 days a week.

Selecting a Weight Loss Program

Some people lose weight on their own; others like the support of a structured program. Overweight people who are successful at losing weight, and keeping it off, can reduce their risk factors for heart disease. If you decide to join any kind of weight-control program, here are some questions to ask before you join.

- Does the program provide counseling to help you change your eating activity and personal habits?
  The program should teach you how to change permanently those eating habits and lifestyle factors, such as lack of physical activity, that have contributed to weight gain.
- Is the staff made up of a variety of qualified counselors and health professionals such as nutritionists, registered dietitians, doctors, nurses, psychologists, and exercise physiologists?
  You need to be evaluated by a physician if you have any health problems, are currently taking any medicine or plan on taking any medicine, or plan to lose more than 15 to 20 pounds. If your weight-control plan uses a very low-calorie diet (a special liquid formula that replaces all food for 1 to 4 months), an exam and followup visits by a doctor also are needed.
- Is training available on how to deal with times when you may feel stressed and slip back to old habits?
  The program should provide long-term strategies to deal with weight problems you may have in the future. These strategies might include things like setting up a support system and establishing a physical activity routine.
- Is attention paid to keeping the weight off? How long is this phase? Choose a program that teaches skills and techniques to make permanent changes in eating habits and levels of physical activity to prevent weight gain.
- Are food choices flexible and suitable? Are weight goals set by the client and the health professional?
  The program should consider your food likes and dislikes and your lifestyle when your weight-loss goals are planned.

There are other questions you can ask about how well a weight-loss program works. Because many programs don't gather this information, you may not get answers. But it's still important to ask them:

- What percentage of people complete the program?
- What is the average weight loss among people who finish the program?
- What percentage of people have problems or side effects? What are they?
- Are there fees or costs for additional items, such as dietary supplements?

Remember, quick weight loss methods don't provide lasting results. Weight-loss methods that rely on diet aids like drinks, prepackaged foods, or diet pills don't work in the long run. Whether you lose weight on your own or with a group, remember that the most important changes are long term. No matter how much weight you have to lose, modest goals and a slow course will increase your chances of both losing the weight and keeping it off.

Guide to Behavior Change

Your Weight Is Important

Over the past few years it has become clear that weight is an important health issue. Some people who need to lose weight for their health don't recognize it, while others who don't need to lose weight want to get thinner for cosmetic reasons. We understand that in some ways your weight is different from, for example, your cholesterol level or your blood pressure, because you can't see what these are by looking at someone. Many patients have had health care providers who approached their weight in a less-than-sensitive or helpful manner. Some patients may have had health care encounters in which they felt blamed, but not helped. Successful weight management is a long-term challenge.

Weight can affect a person's self-esteem. Excess weight is highly visible and evokes some powerful reactions, however unfairly, from other people and from the people who carry the excess weight. The amount of weight loss needed to improve your health may be much less than you wish to lose, when you consider how you evaluate your weight. Research has shown that your health can be greatly improved by a loss of 5–10 percent of your starting weight. That doesn't mean you have to stop there, but it does mean that an initial goal of losing 5–10 percent of your starting weight is both realistic and valuable.

Behaviors That Will Help You Lose Weight and Maintain It

Set the Right Goals

Setting the right goals is an important first step. Most people trying to lose weight focus on just that one goal: weight loss. However, the most productive areas to focus on are the dietary and physical activity changes that will lead to long-term weight change. Successful weight managers are those who select two or three goals at a time that are manageable.

Useful goals should be (1) specific; (2) attainable (doable); and (3) forgiving (less than perfect). "Exercise more" is a great goal, but it's not specific. "Walk 5 miles every day" is specific and measurable, but is it doable if you're just starting out? "Walk 30 minutes every day" is more attainable, but what happens if you're held up at work one day and there's a thunderstorm during your walking time another day? "Walk 30 minutes, 5 days each week" is specific, doable, and forgiving. In short, a great goal!

Nothing Succeeds Like Success

Shaping is a behavioral technique in which you select a series of short-term goals that get closer and closer to the ultimate goal (e.g., an initial reduction of fat intake from 40 percent of calories to 35 percent of calories, and later to 30 percent). It is based on the concept that "nothing succeeds like success." Shaping uses two important behavioral principles: (1) consecutive goals that move you ahead in small steps are the best way to reach a distant point; and (2) consecutive rewards keep the overall effort invigorated.

Reward Success (But Not With Food)

An effective reward is something that is desirable, timely, and dependent on meeting your goal. The rewards you choose may be material (e.g., a movie or music download, or a payment toward buying a more costly item) or an act of self-kindness (e.g., an afternoon off from work or just an hour of quiet time away from family). Frequent small rewards, earned for meeting smaller goals, are more effective than bigger rewards that require a long, difficult effort.

Balance Your Food Checkbook

"Self-monitoring" refers to observing and recording some aspect of your behavior, such as calorie intake, servings of fruits and vegetables, amount of physical activity, etc., or an outcome of these behaviors, such as weight. Self-monitoring of a behavior can be used at times when you're not sure how you're doing, and at times when you want the behavior to improve. Self-monitoring of a behavior usually moves you closer to the desired direction and can produce "real-time" records for review by you and your health care provider. For example, keeping a record of your physical activity can let you and your provider know quickly how you're

doing. When the record shows that your activity is increasing, you'll be encouraged to keep it up. Some patients find that specific self-monitoring forms make it easier, while others prefer to use their own recording system.

While you may or may not wish to weigh yourself frequently while losing weight, regular monitoring of your weight will be essential to help you maintain your lower weight. When keeping a record of your weight, a graph may be more informative than a list of your weights. When weighing yourself and keeping a weight graph or table, however, remember that one day's diet and exercise patterns won't have a measurable effect on your weight the next day. Today's weight is not a true measure of how well you followed your program yesterday, because your body's water weight will change from day to day, and water changes are often the result of things that have nothing to do with your weight-management efforts.

Avoid a Chain Reaction

Stimulus (cue) control involves learning what social or environmental cues seem to encourage undesired eating, and then changing those cues. For example, you may learn from reflection or from self-monitoring records that you're more likely to overeat while watching television, or whenever treats are on display by the office coffee pot, or when around a certain friend. You might then try to change the situation, such as by separating the association of eating from the cue (don't eat while watching television), avoiding or eliminating the cue (leave the coffee room immediately after pouring coffee), or changing the circumstances surrounding the cue (plan to meet your friend in a nonfood setting). In general, visible and reachable food items are often cues for unplanned eating.

Get the Fullness Message

Changing the way you go about eating can make it easier to eat less without feeling deprived. It takes 15 or more minutes for your brain to get the message that you've been fed. Eating slowly will help you feel satisfied. Eating lots of vegetables and fruits can make you feel fuller. Another trick is to use smaller plates so that moderate portions do not appear too small. Changing your eating schedule, or setting one, can be helpful, especially if you tend to skip, or delay, meals and overeat later.

? Learning Activity 7.1

Find out about Weight Loss Fraud.

- How can you protect yourself?
- What should you keep in mind when buying supplements?
- How do you spot fraud?

? Optional Learning Activity

Read this article—How Sweet It Isn't

- Should excess sugar consumption be regulated?

Sources

Who should lose weight?: Understanding Adult Obesity, WIN, NIDDK, NIH, win.niddk.nih.gov/publications/understanding.htm

Selecting a Weight Loss Program: Lose Weight Program, NHLBI, NIH, http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/wtl_prog.htm

Guide to Behavior Change: Guide to Behavior Change, NHLBI, NIH, http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/behavior.htm

? Exercise 2.7.1

1. What role does calorie balance play in weight control?
2. Name one healthy strategy for maintaining a healthy weight.
3. Why are fad diets often ineffective for long-term weight control?

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2.8: Eating Disorders

Anorexia Nervosa

Anorexia nervosa, or anorexia, is a type of eating disorder that mainly affects adolescent girls and young women. A person with this disease has an intense fear of gaining weight and limits the food she eats. She:

- Has a low body weight
- Refuses to keep a normal body weight
- Is extremely afraid of becoming fat
- Believes she is fat even when she's very thin
- Misses three (menstrual) periods in a row (for girls/women who have started having their periods)

Anorexia affects your health because it can damage many parts of your body. A person with anorexia will have many of these signs:

- Loses a lot of weight
- Talks about weight and food all the time
- Moves food around the plate; doesn't eat it
- Weighs food and counts calories
- Follows a strict diet
- Won't eat in front of others
- Ignores/denies hunger
- Uses extreme measures to lose weight (self-induced vomiting, laxative abuse, diuretic abuse, diet pills, fasting, excessive exercise)
- Thinks she's fat when she's too thin
- Gets sick a lot
- Weighs self several times a day
- Feels depressed
- Feels irritable
- Doesn't socialize
- Wears baggy clothes to hide appearance

Treatment

A health care team of doctors, nutritionists, and therapists will help the patient get better. They will:

- Help bring the person back to a normal weight
- Treat any psychological issues related to anorexia
- Help the person get rid of any actions or thoughts that cause the eating disorder

Some research suggests that the use of medicines—such as antidepressants, antipsychotics, or mood stabilizers—may sometimes work for anorexic patients. It is thought that these medicines help the mood and anxiety symptoms that often co-exist with anorexia. Other recent studies, however, suggest that antidepressants may not stop some patients with anorexia from relapsing. Also, no medicine has shown to work 100 percent of the time during the important first step of restoring a patient to healthy weight. So, it is not clear if and how medications can help anorexic patients get better, but research is still happening.

Some forms of psychotherapy can help make the psychological reasons for anorexia better. Psychotherapy is sometimes known as "talk therapy." It uses different ways of communicating to change a patient's thoughts or behavior. This kind of therapy can be useful for treating eating disorders in young patients who have not had anorexia for a long time.

Individual counseling can help someone with anorexia. If the patient is young, counseling may involve the whole family. Support groups may also be a part of treatment. In support groups, patients, and families meet and share what they've been through.

Some researchers point out that prescribing medicines and using psychotherapy designed just for anorexic patients works better at treating anorexia than just psychotherapy alone. Whether or not a treatment works, though, depends on the person involved and his or her situation. Unfortunately, no one kind of psychotherapy always works for treating adults with anorexia.

Anorexia Nervosa Fact Sheet

This fact sheet explains anorexia's causes, signs and symptoms, and its effects on the body. It also provides information for pregnant women who have or have had anorexia.

Bulimia Nervosa

Bulimia nervosa, or bulimia, is a type of eating disorder. Someone with bulimia eats a lot of food in a short amount of time (bingeing) and then tries to get rid of the calories by purging. Purging might be done in these ways:

- Making oneself throw up
- Taking laxatives (pills or liquids that increase how fast food moves through your body and leads to a bowel movement)

A person with bulimia may also use these ways to prevent weight gain:

- Exercising a lot (more than normal)
- Restricting her eating or not eating at all (like going without food for a day)
- Taking diuretics (pills that make you urinate)

Bulimia is more than just a problem with food. It's a way of using food to feel in control of other feelings that may seem overwhelming. Purging and other behaviors to prevent weight gain are ways for people with bulimia to feel more in control of their lives and to ease stress and anxiety.

Unlike anorexia, when people are severely underweight, people with bulimia may be underweight, overweight, or have a normal weight. This makes it harder to know if someone has this disease. However, someone with bulimia may have these signs:

- Thinks about food a lot
- Binges (normally in secret)
- Throws up after bingeing
- Uses laxatives, diet pills, or diuretics to control weight
- Is depressed
- Is unhappy and/or thinks a lot about her body shape and weight
- Eats large amounts of food quickly
- Goes to the bathroom all the time after she eats (to throw up)
- Exercises a lot, even during bad weather, fatigue, illness, or injury
- Unusual swelling of the cheeks or jaw area
- Cuts and calluses on the back of the hands and knuckles from making herself throw up
- White enamel of teeth wears away making teeth look clear
- Doesn't see friends or participate in activities as much
- Has rules about food — has "good" foods and "bad" foods

Video

Much of the information provided in **Chapter 6, Lesson 8: Eating Disorders** is also presented in a 46 minute video titled: **The Silent Hunger: Anorexia and Bulimia**.



- *"This program answers two important questions: what are eating disorders, and what causes them? The program specifically examines anorexia nervosa, bulimia nervosa, and binge eating syndrome. Seven females who have all suffered from eating disorders, the father of a woman who died as a result of her disorder, and health professionals offer their insights and knowledge. These interviews are highlighted by dramatic sequences designed to encourage a greater understanding of the issues and emotions associated with eating disorders."*
- (from Films Media Group, 1994. Films On Demand © 1994)To view this video, click on The Silent Hunger: Anorexia and Bulimia

Instructions

- Click on the **Expand** icon (left of Speaker Volume icon) to expand the image to fill the screen.
- Click on the **Play** button in the center of the screen or in the bottom left corner.
- At any time you can press the **ESC key** on your computer to return to the browser window or you can move your cursor to the bottom of the screen to make the toolbar visible again; then you can pause or adjust the volume.
- Closed captioning is available for this video. You'll see a "**Turn CC On**" button in the upper right hand of the video player. Click on this button to toggle captions on/off.
- To view specific segments from this video, click on **Segments** button then click on the title of the segment that interests you.

Sources

Anorexia Nervosa: Anorexia Nervosa,NIH,womenshealth.gov/mental-health/illnesses/anorexia-nervosa.cfm

Bulimia Nervosa: Bulimia Nervosa, womenshealth.gov/mental-health/illnesses/bulimia-nervosa.cfm

? Exercise 2.8.1

1. What is one common characteristic of eating disorders?
2. Name two types of eating disorders.
3. How can early intervention improve outcomes for people with eating disorders?

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CHAPTER OVERVIEW

3: Personal Relationships and Violence

Learning Objectives

- Examine the health benefits of a healthy marriage.
- Describe the characteristics of a healthy marriage.

3.1: Communication
3.2: Sexuality and Intimacy
3.3: Marriage and Relationships
3.4: Loss
3.5: Parenting
3.6: Family and Societal Violence

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3.1: Communication

Communication among Couples

Learning and Practicing New Habits

Effective communication isn't easy. Teaching and learning new communication skills take patience, patience, patience, as well as practice, practice, practice.

Taking the time to talk is important. Your relationship provides a safe place to share feelings, thoughts, fears, dreams, and hopes. Make a special effort to find time to talk to your partner more frequently.

In tough times, people feel overwhelmed with worries and responsibilities. Time together as a couple is often the last thing on our minds as we deal with the hassles of daily life. Although you may be busy, stressed, and worried, take the time to focus on your partners' needs and spend quality time together without interruption. Even a few minutes a day talking about what has occurred can be a relief from stress. Be thoughtful by considering whether those difficult or problem-solving discussions could be reserved for other times when you and your partner are not tired or distracted.

You may need to be the one who starts conversations. It is worth it to be the one who initiates conversations. You can find many ways to open the door for communication if you are sensitive to changes in your partner's feelings and needs. Taking the time to listen keeps the lines of communication open and improves your relationship.

Finding Time to Talk

- Spend time talking with limited interruptions.
- Make a date to talk to your partner.
- Plan at least one routine family time each week.
- Talk instead of watching TV.
- Talk when you take a walk together.
- Talk while you work together on household chores.
- Talk in the car while traveling to activities.

? Summary

In good times and bad, couples need each other. Good communication does not mean that your family won't have any problems, or that your partner will always like what you have to say. Good communication means the chances of solving problems are much higher if you and your partner can express yourselves openly and freely with each other.

Marriage and Relationships

For couples today, there is an abundance of information on how to sustain healthy, happy marital relationships. From how-to books to advice given on television and radio, couples are bombarded with strategies, tips, and techniques focused on "what to do" in their relationships. Most of this information assumes that if couples follow a few short rules, then they can have happy relationships. What most fail to realize is that these new, positive practices won't work without recognizing and addressing what has been done and what is not working. Most information available to couples falls short on giving examples of "what not to do" in a relationship. Communication is the key, but it is difficult to apply effective strategies to harmful interactions.

Four negative patterns of interaction have been demonstrated as major destroyers of marital relationships:

- Criticism
- Contempt
- Defensiveness
- Stonewalling

Criticism

Criticism is using hurtful or judgmental comments aimed at your partner's character or personality. With criticism, the blame is placed on the person and not the problematic behavior. Criticism tends to be a repetitive cycle—a single critical moment can end up in a continued exchange. Most critical statements can be recognized by the phrases, "you always" or "you never." The following are some examples of criticism:

- You never finish any project that you start. You're so lazy.
- When we go out to eat, you always embarrass me with your table manners.

Contempt

Contempt is a more complex negative interaction. It is an effort to psychologically abuse your partner through disrespectful statements and actions. Contempt has both verbal and non-verbal deliveries. Verbal examples of contempt include sarcasm, hostile humor, and mockery. For example, nonverbal displays of contempt include rolling of the eyes and sucking of the teeth during conflict. Contempt sends your partner a message of scorn—that they are inferior and worthless.

Defensiveness

Defensiveness is often a natural response to receiving criticism and contempt. When faced with criticism and contempt, most people find a need to defend themselves. However, couples can be defensive even when criticism is constructive. Defensiveness may be a response to previous, current, and/or future attacks. If one or both persons are acting defensively, it is most likely the case they are not listening. Defensiveness may take many forms including:

- Making excuses for behavior
- Repeating a statement for effect
- Denying responsibility for actions
- Answering a complaint with another complaint

Stonewalling

The final negative pattern of interaction is stonewalling. As the name implies, this occurs when partners "put a wall" around themselves, either physically or psychologically. Stonewalling is often used to decrease conflict, and when delivered in moderation, can be healthy. On the other hand, continual failure to respond and/or engage in conversation escalates rather than reduces conflict. Examples of stonewalling include:

- Leaving the room
- Putting a physical barrier between you and your partner (newspaper, book, child)
- Focusing intently on something other than your partner during a discussion
- Failure to actively listen
- Responding with a blank stare

What can be done

All of the above become patterns of interaction in which couples may find themselves trapped. One negative interaction leads to another, often in a repetitive cycle. Researchers have determined that couples caught in this vicious cycle may be headed for divorce (Gottman, 1994; Gottman & Levenson, 2000). If you or a couple you know are experiencing any of these problems in a relationship, don't be discouraged. Although these may seem like a death sentence, there are ways that couples can break these patterns and start having more positive interactions. What is most important is to mimic the behaviors of pre-maritial couples and newlyweds. The following suggestions promote a healthy marriage, regardless of whether you're newlyweds or nearing your golden anniversary.

1. Eliminate criticism. Use complaints. It is okay to complain about troublesome behaviors. Discussing your feelings about the behavior is okay as long as there are no personal attacks. Use the word I instead of you and describe how the behavior makes you feel. Talk about the behavior and not the person.
    - **Example**: "When we go out to eat, you always embarrass me," becomes "I feel hurt and ashamed when you make fun of me in public.

2. Build on your friendship base.Validate your partner and his/her feelings, thoughts, needs, and desires, etc.
    - **Example:** "I recognize that you need to talk more about our relationship. What is on your mind?"
3. Take accountability and responsibility for your own actions. Do not make excuses. Apologize and correct the behavior (if possible).
    - **Example**: "I'm sorry that I yelled at you earlier. I've been under a lot of pressure at work, but it is unfair to take it out on you."
4. Use reflective listening. Repeat what your partner has stated and then respond. Show them that you are listening and hearing them.
    - **Example**:
      Partner 1: I would appreciate it if you would talk to me before you discipline the kids. That way we can be a united front."
      Partner 2: What I'm hearing is that you would like for us to talk about disciplining the kids before I make any decisions. I think that is a good idea.
5. Continue dating. Make a point to rekindle the dating aspect of your relationship.
    - **Example:** Go for walks, hold hands, act silly, etc. Find ways to show appreciation to your partner throughout the day (i.e., e-mails, notes, phone calls, etc.)
6. Seek help if needed. If you can identify these negative interactions in your relationship or you think you may need help, see a licensed marriage and family therapist or other professional. Do not try and fix everything on your own.
    - **Example**: Talk to a trusted family member, friend, or your local extension agent in order to find resources in your area.

? Summary

Before a couple can learn and/or practice new routines in their relationship, they must rid themselves of the old ways that aren't working. It is important to first identify negative patterns and destructive behaviors and target them for change. At that point, the couple can begin rebuilding their relationship.

Effective Communication

Effective communication is critical to successful relationships. Researchers and therapists have found at least nine skills that can help couples learn to talk effectively about important issues (Gottman 1994; Markman, Stanley, and Blumberg 2010; Schramm and Harris 2011). How we interact about issues such as time spent together/apart, money, health, gender differences, children, family, friends, commitment, trust, and intimacy affects our ability to develop and maintain lasting marital friendships. If learned well, these nine skills can help put our relationships on a positive trajectory for success. (Note: The word "marriage" is interchangeable with "relationship," if you are not married.)

Helpful Information about Communication

What do couples talk about?

- **Time Together/Apart.** Both the quantity and quality of time we spend together influence the well-being of our marital friendships. Spending time apart participating in other activities also influences the well-being of our relationships.
- **Money.** How we think and talk about money, our spending habits, and our ability to budget, invest, and plan for the future impact couple financial management processes and practices.
- **Health.** Couples must talk about many health-related issues, including nutrition, exercise, illness, disease, accidents, health care, mortality, and death.
- **Men/Women.** Because men tend to be more task-oriented in their communication styles and women tend to be more process-oriented, men tend to want to solve issues immediately, while women tend to want to talk about them more and come to a consensus about what should be done.
- **Children.** How children develop physically, socially, emotionally, intellectually, and spiritually are often topics of discussion. Focusing on the best ways to consistently meet children's needs is considered being child-centered.
- **Family/In-Laws/Friends.** Couples often talk about situations and circumstances surrounding the interactions they have with their closest relationships.

What do couples communicate when they are communicating?

- **Commitment.** How we "hang in there" and contribute to our marital friendship, even when things aren't going particularly well, is a sign of how committed we are to our relationship. Loyalty and fidelity are aspects of commitment and trust.
- **Trust.** Trusting relationships are relationships in which both partners are dependable, available to support each other, and responsive to each other's needs. An ability to negotiate conflict and a positive outlook about the future of the relationship are also components of trust.
- **Intimacy.** The social, intellectual, emotional, spiritual, and physical connections we make with each other determine the levels of intimacy we experience in our relationships.

What do couples argue about?

Because the items listed above are some of the major topics couples talk about, it follows that they are also the same topics that can spur disagreements. For instance, it is a familiar joke that people can have difficulties in their relationships with in-laws. Take for example, "What is the difference between in-laws and outlaws? Answer: One is 'Wanted!'" Sayings such as these underscore the importance of knowing how your relationships with others can affect your marriage and could potentially become the topic of a marital conflict.

- **Control and Power.** Control and power are highly associated with the topics couples argue about. Indeed, control and power issues are the foundation of most conflicts. Typically, one person (or each person) is bent on having his or her own way. The saying "my way or the highway" is a common phrase used by someone with an inflexible perspective. If we see an issue one way and expect everyone else to see it the same way we do, then we are more likely to try to exert power and control over others and sway them to our perspective. Attempting to exert control and power over our partner typically results in win/lose or lose/lose outcomes for our marital friendships.

Sources

Communication among Couples: Can We Talk? Improving Couples' Communication by Eboni J. Baugh and Deborah Humphries, FCS2178, Florida Marriage Preparation series, from the Department of Family, Youth and Community Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date November 2001. Reviewed October 2006. Revised December 2009, edis.ifas.ufl.edu/fy044

Marriage and Relationships: Un-Healthy Marital Interactions: What Not To Do and What Can Be Done! Eboni J. Baugh, FCS2247, Family Youth and Community Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, August 2006, edis.ifas.ufl.edu/fy847.

Effective Communication: Written by Victor William HarrisFCS2315, Department of Family, Youth and Community Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published January 2012. http://edis.ifas.ufl.edu/fy1277.

? Exercise 3.1.1

1. What is one key element of effective communication?
2. How can active listening improve understanding in conversations?
3. Give an example of a barrier to effective communication.

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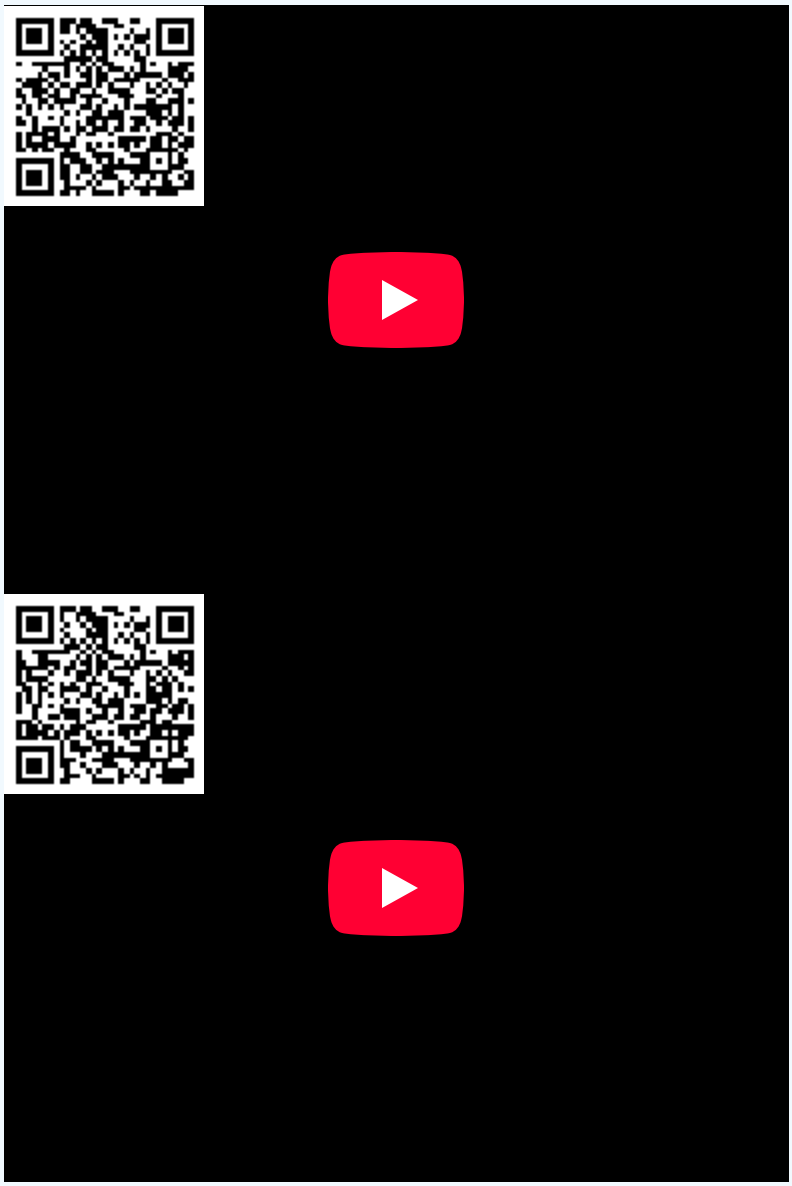
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3.2: Sexuality and Intimacy

Understanding Healthy Relationships

Learning Activity

Watch these two short videos:



Are you satisfied with the depths of the relationships in your life?

Sexuality and Intimacy

The idea that sex can be an addiction is new to many people.

The term “addiction” has become a popular metaphor to describe any form of self-destructive behavior that one is unable to stop despite known and predictable adverse consequences. For some people, sexual behavior fits that description. It involves frequent self-destructive or high risk activity that is not emotionally fulfilling, that one is ashamed of, and that one is unable to stop despite it causing repeated problems in the areas of marriage, social relationships, health, employment, finances, or the law.

Recognition that self-destructive sexual behavior can be an addiction has spawned the rapid growth of four nationwide self-help organizations for persons trying to recover from this problem. All are 12-step recovery programs patterned after Alcoholics Anonymous.

One might ask how sex can be an addiction when it is doing what comes naturally and does not involve abuse of a psychoactive substance like drugs or alcohol. The scientific argument for addiction is based, in part, on recent advances in neurochemistry that suggest we carry within us our own source of addictive chemicals.

When pleasure centers in the human brain are stimulated, chemicals called endorphins are released into the blood stream. Endorphins are believed to be associated with the mood changes that follow sexual release. Any chemical that causes mood changes can be addictive, with repeated exposure altering brain chemistry to the point that more of the chemical is "required" in order to feel "normal."

For example, experiments with hamsters have shown that the level of endorphins in their blood increases dramatically after several ejaculations. Experimental rats habituated to endorphins will go through much pain in order to obtain more. In rats, the addiction to endorphins is even stronger than the addiction to morphine or heroin.

The sex addict uses sex as a quick fix, or as a form of medication for anxiety, pain, loneliness, stress, or sleep. Sex addicts often refer to sex as their "pain reliever" or "tension reliever." In a popular novel, the heroine describes sex as "the thinking women's Valium."

Other indicators that sexual behavior may be out of control include: an obsession with sex that dominates one's life, including sexual fantasies that interfere with work performance; so much time devoted to planning sexual activity that it interferes with other activities; strong feelings of shame about one's sexual behavior; a feeling of powerlessness or inability to stop despite predictable adverse consequences; inability to make a commitment to a loving relationship; extreme dependence upon a relationship as a basis for feelings of self-worth; or little emotional satisfaction gained from the sex act.

Compulsive or addictive sexual behavior may take various forms, including what many regard as "normal" heterosexual behavior. The type of sexual activity and even the frequency or number of partners are not of great significance in diagnosing this problem. Some individuals have a naturally stronger sex drive than others, and the range of human sexual activity is so broad that it is difficult to define "normal" sexual behavior. What is significant is a pattern of self-destructive or high risk sexual behavior that is unfulfilling and that a person is unable to stop.

The roots of out-of-control sexual behavior may be quite varied. It may be caused by an underlying personality disorder, an "addiction" to sex, or a physical disorder. The traditional disorders of exaggerated sexuality, nymphomania in the female and satyriasis in the male, are believed to be caused by a disorder of the pituitary gland or irritation of the brain cortex by a tumor, arteriosclerosis or epilepsy. These physical disorders are rare.

Compulsive or addictive sexual behavior is a concern because it may lead to poor judgment or lack of discretion, indicate a serious emotional or mental problem, open one to exploitation, manipulation, or extortion.

Sources

Sexuality and Intimacy: Sexual Addiction, USDA, http://www.dm.usda.gov/ocpm/Security%20Guide/Eap/Sex.htm

? Exercise 3.2.1

1. How does intimacy differ from sexuality?
2. Name one way individuals can express intimacy in relationships.
3. Why is communication important in sexual relationships?

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3.3: Marriage and Relationships

What is a “healthy marriage?

There are at least two characteristics that all healthy marriages have in common.

- First, they are mutually enriching, and
- Second, both spouses have a deep respect for each other.

It is a mutually satisfying relationship that is beneficial to the husband, wife and children (if present). It is a relationship that is committed to ongoing growth, the use of effective communication skills and the use of successful conflict management skills.

Healthy Marriage Matters

Research suggests that children who grow up in healthy married, two-parent families do better on a host of outcomes than those who do not. Further, many social problems affecting children, families, and communities could be prevented if more children grew up in healthy, married families.

Examples of social science findings include:

- Married couples seem to build more wealth, on average, than singles or cohabiting couples, thus decreasing the likelihood that their children will grow up in poverty.
- Children who live in a two-parent, married household enjoy better physical health, on average, than children in non-married households.
- Healthy marriages reduce the risk of adults and children either perpetrating, or being victimized by, crime.Benefits of Healthy Marriages

For Children and Youth

Researchers have found many benefits for children and youth who are raised by parents in healthy marriages, compared to unhealthy marriages, including the following:

1. More likely to attend college
2. Demonstrate less behavioral problems in school
3. Less likely to be a victim of physical or sexual abuse
4. Less likely to abuse drugs or alcohol
5. Less likely to commit delinquent behaviors
6. More likely to succeed academically
7. Physically healthier
8. Emotionally healthier
9. Less likely to attempt or commit suicide
10. Decreases their chances of divorcing when they get married
11. Less likely to become pregnant as a teenager, or impregnate someone.
12. Less likely to be sexually active as teenagers
13. Less likely to contract STD’s
14. Less likely to be raised in poverty

For Women

Researchers have found many benefits for women who are in healthy marriages, compared to unhealthy marriages, including the following:

1. More satisfying relationship
2. Emotionally healthier
3. Wealthier
4. Less likely to be victims of domestic violence, sexual assault, or other violent crimes
5. Less likely to attempt or commit suicide

6. Decrease risk of drug and alcohol abuse
7. Less likely to contract STD's
8. Less likely to remain or end up in poverty
9. Have better relationships with their children
10. Physically healthier

For Men

Researchers have found many benefits for men who are in healthy marriages, compared to unhealthy marriages, including the following:

1. Physically healthier
2. Wealthier
3. Increase in the stability of employment
4. Higher wages
5. Emotionally healthier
6. Decrease risk of drug and alcohol abuse
7. Have better relationships with their children
8. Less likely to commit violent crimes
9. Less likely to contract STD's
10. Less likely to attempt or commit suicide

For Communities

Researchers have found many benefits for communities when they have a higher percentage of couples in healthy marriages, compared to unhealthy marriages, including the following:

1. Higher rates of physically healthy citizens
2. Higher rates of emotionally healthy citizens
3. Higher rates of educated citizens
4. Lower domestic violence rates
5. Lower crime statistics
6. Lower teen age pregnancy rates
7. Lower rates of juvenile delinquency
8. Higher rates of home ownership
9. Lower rates of migration
10. Higher property values
11. Decreased need for social services

Marital Status and Health: United States, 1999–2002

A report from the Centers for Disease Control and Prevention suggests that married adults are healthier than divorced, widowed or never married adults.
The report, "Marital Status and Health: United States, 1999-2002," was based on interviews with 127,545 adults aged 18 and over as part of the National Health Interview Survey, conducted by CDC's National Center for Health Statistics. The study looked at health status and limitations, health conditions, health related behaviors according to marital status and also by age, race/ethnicity and socioeconomic factors such as education and poverty status.

Among the findings in the report:

- Nearly 60% of adults are married, 10.4% are separated or divorced, 6.6% are widowed, 19% are never married and 5.7% are living with a partner. Marital status varies greatly among race/ethnic groups: approximately 61 percent of white adults, 58 percent of Hispanic adults, and 38 percent of black adults are married, according to the survey.
- Married adults are less likely than other adults to be in fair or poor health, and are less likely to suffer from health conditions such as headaches and serious psychological distress.
- Married adults are less likely be limited in various activities, including work and other activities of daily living.

- Married adults are less likely to smoke, drink heavily or be physically inactive. However, married men are more likely to be overweight or obese than other men.
- Adults who live in cohabiting relationships are more likely to have health problems than married adults and more closely resemble divorced and separated adults.
- The association between marital status and health is most striking in the youngest age group although it persists throughout the age groups studied.

While the results show that married adults are generally in better health than unmarried adults, the reasons for better health status among married adults cannot be determined with cross-sectional data collected in the National Health Interview Survey.

The Effects of Marriage on Health

Understanding the Marriage-Health Connection

The relationship between marriage and health is complex. Marital status can both affect health outcomes and be affected by them. Healthier people may have a better chance of marrying and staying married because they may be viewed as more desirable marriage partners based on their physical attractiveness, earnings potential, mental well-being, degree of self-sufficiency, or likely longevity. Social scientists describe this pattern as the selection of healthy people into marriage. If this is the only reason for the correlation between marriage and health, then marriage is not causing better health. Instead, the observed health differences between married and unmarried people are the result of healthier people being more likely to marry.

Alternatively, there may be a true causal link between marriage and better health. Marriage could improve health outcomes in a variety of ways. It may result in two incomes, as well as economies of scale, improving economic well-being.

Having more income could, in turn, improve health outcomes by enhancing access to health care or lowering stress. In addition, a spouse may play an important role in monitoring and encouraging healthy behaviors (such as good eating habits and regular exercise), as well as in discouraging unhealthy ones (such as smoking or heavy drinking). Marriage may also provide an emotionally fulfilling, intimate relationship, satisfying the need for social connection, which could have implications for both physical and mental health. Most researchers conclude that the association between marriage and health represents a combination of the selection of healthier people into marriage and true health benefits from marriage.

Measuring the Effects of Marriage

Because marriage is likely to be both a cause and a consequence of health outcomes, research must disentangle the influence of selection from the true causal influence of marriage. Distinguishing between these two factors requires careful analysis and advanced statistical methods that have been absent from many studies.

The studies providing the strongest evidence use longitudinal data and examine the association between changes in health outcomes and transitions into and out of marriage. Studies of this type provide more convincing evidence of a causal relationship between marriage and health because sample members serve as their own control group, and the effect of marriage is measured by comparing their outcomes before and after marriage. This method avoids comparing two groups that may have different background characteristics in particular, people who marry and people who do not which may lead to misleading and inaccurate results.

Some health outcomes are not well suited for this type of analysis, however. For example, many physical health outcomes cannot be examined in this way, because changes can unfold over a long time and may not be apparent immediately after a marital transition.

Effects on Health Behaviors

Marriage may influence health through its effect on behaviors such as alcohol consumption, drug use, cigarette smoking, diet, and exercise. Recent research suggests that marriage has significant effects on the health behaviors of both men and women, but the pattern is mixed marriage is associated with healthier behaviors in some cases and less healthy behaviors in others. Studies consistently indicate that marriage reduces heavy drinking and overall alcohol consumption, and that effects are similar for young men and young women, and for both African Americans and whites. Although the research is less extensive, marriage is also associated with reduced marijuana use for young men, but less so for women. Less is known about the effects of marriage on the

substance use of older adults. Studies of marriage and smoking reveal no consistent pattern of results, suggesting that marriage may have little or no influence on this behavior.

In contrast to studies of alcohol and drug use, studies of the effect of marriage on weight and physical activity suggest that marriage may have negative effects on healthy behaviors and may encourage a more sedentary lifestyle. Several rigorous studies find that marriage leads to modest weight increases for both men and women; typically averaging less than five pounds. The research on the effects of marriage on physical activity is less conclusive because it is not based on longitudinal analysis and does not fully adjust for differences between those who marry and those who do not. The evidence that is available suggests marriage may lead to reductions in physical activity, particularly for men.

For certain health behaviors in particular, substance use among younger adults and weight gain among all adults the influence of marriage has been well studied and is well understood. For other behaviors, less is known and additional research is needed before stronger conclusions can be drawn.

Effects on Health Care Access, Use, and Costs

Marriage may influence physical health through its effects on health care access and use. Studies of the link between marriage and health insurance suggest that by offering access to coverage through a spouse's policy marriage increases the likelihood of having insurance and reduces the likelihood of becoming uninsured after a job loss or other major life event. Limited evidence also suggests that marriage may increase the use of preventive care such as cancer screenings.

Because of its effects on health care use, marriage is also associated with lower health care costs among older adults. For example, studies show that, because marriage reduces the risk of nursing home admission, marriage may also lead to reduced nursing home costs. The effect of marriage in shortening hospital stays may also lead to reductions in health care costs. Research indicates that the effect of marriage on health care costs exists independent of the effect of marriage on physical health. Specifically, many married people rely on their spouses for informal care, and thus require fewer long hospital stays and nursing home admissions, resulting in lower health care costs even if married and unmarried older adults are equally likely to get sick. These studies find that wives are especially likely to provide informal care for their husbands at home, so the effect of marriage on health care costs may be larger for men.

Effects on Mental Health

Marriage may affect many aspects of mental health. The most recent rigorous research suggests that marriage reduces depressive symptoms for both men and women. In particular, these studies find that getting married decreases depressive symptoms, while getting divorced increases them. Research has also documented that increases in depressive symptoms after divorce are long-lasting and that the prevalence of these symptoms remains elevated years after the marital breakup. In addition, studies comparing the mental health of stably married adults to those who remain unmarried find that those who are stably married have fewer depressive symptoms (and smaller increases in these symptoms as they grow older), even after controlling for baseline mental health.

Effects on Physical Health and Longevity

Many studies have documented that people who marry live longer and enjoy better physical health than those who do not marry. However, methodological issues require caution in interpreting this pattern, because most of the research in this area relies on descriptive methods that do not adequately control for the possible selection of healthier people into marriage. Although central to the overall assessment of the link between marriage and health, rigorous research evidence concerning the effect of marriage on specific physical health outcomes is limited, and few solid conclusions can be drawn.

The rigorous research currently available provides limited evidence of an effect of marriage on physical health. Recent research finds a significant positive effect of marriage on how men rate their overall physical health status; however, it finds no such effect for women. Researchers find a positive effect on women's physical health, as measured by the prevalence of specific health conditions and illnesses. However, no recent rigorous studies based on U.S. samples have examined whether a similar marriage effect on the frequency of health conditions or illnesses exists among men. Similarly, little evidence exists on the links between marriage and specific health conditions or diseases. One exception is a recent study that suggests a possible link between marriage and the risk of cardiovascular disease for women; however, the study finds no such effect for men. Overall, the existing research

evidence on the links between marriage and physical health is limited to a narrow range of health measures and does not offer a complete picture of the influence of marriage on physical health.

Many studies have pointed to a strong relationship between marriage and longevity, but this research also has limitations. In particular, these studies are typically limited to simple descriptive comparisons of married and unmarried adults that do not adequately distinguish the effect of marriage from the possible effects of healthier people selecting into marriage. As noted, the most reliable studies of links between marriage and health examine measures directly before and after marital transitions. However, because longevity is determined only at the end of life, it is not possible to observe how a marital transition changes longevity.

Intergenerational Health Effects

An emerging literature on the possible intergenerational health effects of marriage suggests that marriage also has potential long-term consequences for the physical health of a couple's children. In particular, studies show that growing up with married parents is associated with better physical health in adulthood and increased longevity. Research suggests that such intergenerational health effects are especially strong for men and operate equally for African American and white men. There is less evidence examining possible differences in this relationship for African American and white women.

There are many possible reasons why parental marital status may have long-term health consequences for children. However, existing research provides limited evidence on the pathways by which childhood family structure affects adult physical health and longevity. Several studies suggest that the effects work mostly through the role of childhood family structure in shaping children's future socioeconomic attainment, and through adult health risk behaviors, such as smoking and heavy drinking. On average, children raised in two-parent families obtain more education and exhibit healthier adult behaviors than children from other types of families. These differences, in turn, have consequences for adult health and longevity.

Research on intergenerational health effects has focused on trends for people born in the late 19th and early 20th centuries, a period when patterns of marriage, divorce, and single parenthood were much different from today. It is possible that the apparent benefits of marriage for children's health have weakened as single parenthood and divorce have become more common and less stigmatizing. In addition, much of the research is limited to data for small nonrepresentative samples. The available nationally representative evidence is based on data sets that began tracking sample members as adults, which limits the ability to control for differences in the background characteristics of those who grew up in a two-parent family and those who did not.

Sources

What is a "healthy marriage?: Why Marriage Matters, Second Edition: Twenty-Six Conclusions from the Social Sciences, September 2005, www.acf.hhs.gov/healthymarriage/about/mission.html#background.

Marital Status and Health: United States, 1999–2002: Marital Status and Health: United States, 1999–2002, Centers for Disease Control and Prevention, //http://www.cdc.gov/nchs/pressroom/04facts/marriedadults.htm//

The Effects of Marriage on Health: The Effects of Marriage on Health, A Synthesis of Recent Research Evidence, U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, Office of Human Services Policy, June 2007, http://aspe.hhs.gov/hsp/07/marriageonhealth/rb.htm.

? Exercise 3.3.1

1. What is one common challenge couples face in marriage?
2. Describe one strategy that can help maintain a healthy relationship.
3. How can trust influence the strength of a relationship?

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3.4: Loss

Bereavement is the period of grief and mourning after a death. When you grieve, it's part of the normal process of reacting to a loss. You may experience grief as a mental, physical, social or emotional reaction. Mental reactions can include anger, guilt, anxiety, sadness, and despair. Physical reactions can include sleeping problems, changes in appetite, physical problems, or illness.

How long bereavement lasts can depend on how close you were to the person who died, if the person's death was expected and other factors. Friends, family, and faith may be sources of support. Grief counseling or grief therapy is also helpful to some people.

Grief

What is grief?

Grief is the normal response of sorrow, emotion, and confusion that comes from losing someone or something important to you. It is a natural part of life. Grief is a typical reaction to death, divorce, job loss, a move away from family and friends, or loss of good health due to illness.

How does grief feel?

Just after a death or loss, you may feel empty and numb, as if you are in shock. You may notice physical changes such as trembling, nausea, trouble breathing, muscle weakness, dry mouth, or trouble sleeping and eating.

You may become angry—at a situation, a particular person, or just angry in general. Almost everyone in grief also experiences guilt. Guilt is often expressed as "I could have, I should have, and I wish I would have" statements.

People in grief may have strange dreams or nightmares, be absent-minded, withdraw socially, or lack the desire to return to work. While these feelings and behaviors are normal during grief, they will pass.

How long does grief last?

Grief lasts as long as it takes you to accept and learn to live with your loss. For some people, grief lasts a few months. For others, grieving may take years.

The length of time spent grieving is different for each person. There are many reasons for the differences, including personality, health, coping style, culture, family background, and life experiences. The time spent grieving also depends on your relationship with the person lost and how prepared you were for the loss.

How will I know when I'm done grieving?

Every person who experiences a death or other loss must complete a four-step grieving process:

1. Accept the loss.
2. Work through and feel the physical and emotional pain of grief.
3. Adjust to living in a world without the person or item lost.
4. Move on with life. The grieving process is over only when a person completes the four steps.

People cope with the loss of a loved one in different ways. Most people who experience grief will cope well. Others will have severe grief and may need treatment. There are many things that can affect the grief process of someone who has lost a loved one. They include:

- The personality of the person who is grieving.
- The relationship with the person who died.
- The loved one's cancer experience and the way the disease progressed.
- The grieving person's coping skills and mental health history.
- The amount of support the grieving person has.
- The grieving person's cultural and religious background.
- The grieving person's social and financial position.

This summary defines grief and bereavement and describes the different types of grief reactions, treatments for grief, important issues for grieving children, and cultural responses to grief and loss.

Bereavement is the period of sadness after losing a loved one through death.

Grief and mourning occur during the period of bereavement. Grief and mourning are closely related. Mourning is the way we show grief in public. The way people mourn is affected by beliefs, religious practices, and cultural customs. People who are grieving are sometimes described as bereaved.

Grief is the normal process of reacting to the loss.

Grief is the emotional response to the loss of a loved one. Common grief reactions include the following:

- Feeling emotionally numb.
- Feeling unable to believe the loss occurred.
- Feeling anxiety from the distress of being separated from the loved one.
- Mourning along with depression.
- A feeling of acceptance.

Normal Grief

Normal or common grief begins soon after a loss and symptoms go away over time.

During normal grief, the bereaved person moves toward accepting the loss and is able to continue normal day-to-day life even though it is hard to do. Common grief reactions include:

- Anxiety over being separated from the loved one. The bereaved may wish to bring the person back and become lost in thoughts of the deceased. Images of death may occur often in the person's everyday thoughts.
- Distress that leads to crying; sighing; having dreams, illusions, and hallucinations of the deceased; and looking for places or things that were shared with the deceased.
- Anger.
- Periods of sadness, loss of sleep, loss of appetite, extreme tiredness, guilt, and loss of interest in life. Day-to-day living may be affected.

In normal grief, symptoms will occur less often and will feel less severe as time passes. Recovery does not happen in a set period of time. For most bereaved people having normal grief, symptoms lessen between 6 months and 2 years after the loss. Many bereaved people will have grief bursts or pangs. Grief bursts or pangs are short periods (20–30 minutes) of very intense distress. Sometimes these bursts are caused by reminders of the deceased person. At other times they seem to happen for no reason. Grief is sometimes described as a process that has stages.

There are several theories about how the normal grief process works. Experts have described different types and numbers of stages that people go through as they cope with loss. At this time, there is not enough information to prove that one of these theories is more correct than the others. Although many bereaved people have similar responses as they cope with their losses, there is no typical grief response. The grief process is personal.

Complicated Grief

There is no right or wrong way to grieve, but studies have shown that there are patterns of grief that are different from the most common. This has been called complicated grief.
Complicated grief reactions that have been seen in studies include:

- Minimal grief reaction: A grief pattern in which the person has no, or only a few, signs of distress or problems that occur with other types of grief.
- Chronic grief: A grief pattern in which the symptoms of common grief last for a much longer time than usual. These symptoms are a lot like ones that occur with major depression, anxiety, or post-traumatic stress.

Cultures have different ways of coping with death

Grief felt for the loss of loved ones occurs in people of all ages and cultures. Different cultures, however, have different myths and mysteries about death that affect the attitudes, beliefs, and practices of the bereaved.
Individual, personal experiences of grief are similar in different cultures.

The ways in which people of all cultures feel grief personally are similar. This has been found to be true even though different cultures have different mourning ceremonies and traditions to express grief.

Cultural issues that affect people who are dealing with the loss of a loved one include rituals, beliefs, and roles.

Helping family members cope with the death of a loved one includes showing respect for the family's culture and the ways they honor the death. The following questions may help caregivers learn what is needed by the person's culture:

- What are the cultural rituals for coping with dying, the deceased person's body, and honoring the death?
- What are the family's beliefs about what happens after death?
- What does the family feel is a normal expression of grief and the acceptance of the loss?
- What does the family consider to be the roles of each family member in handling the death?
- Are certain types of death less acceptable (for example, suicide), or are certain types of death especially hard for that culture (for example, the death of a child)?

Death, grief, and mourning are normal life events. All cultures have practices that best meet their needs for dealing with death. Caregivers who understand the ways different cultures respond to death can help patients of these cultures work through their own normal grieving process.

Sources

Loss: Loss, NIH, National Cancer Institute, http://www.nlm.nih.gov/medlineplus/bereavement.html.

Grief: Grief, SAMHSA, www.samhsa.gov/MentalHealth/Anxiety_Grief.pdf.

? Exercise 3.4.1

1. What are common emotional responses to loss?
2. Explain one healthy way to cope with grief.
3. How can support from others help during the grieving process?

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3.5: Parenting

If you're a parent, you get plenty of suggestions on how to raise your child. From experts to other parents, people are always ready to offer advice. Parenting tips, parents' survival guides, dos, don'ts, shoulds and shouldn'ts—new ones come out daily.

The truth is there is more than one "right" way to be a good parent. Good parenting includes

- Keeping your child safe
- Showing affection and listening to your child
- Providing order and consistency
- Setting and enforcing limits
- Spending time with your child
- Monitoring your child's friendships and activities
- Leading by example

There are many different kinds of families. Some have two parents, while others have a single parent. Sometimes there is no parent and grandparents raise grandchildren. Some children live in foster families, adoptive families, or in stepfamilies.

Families are much more than groups of people who share the same genes or the same address. They should be a source of support and encouragement. This does not mean that everyone gets along all the time. Conflicts are a part of family life. Many issues can lead to conflict, such as illness, disability, addiction, job loss, school difficulties and marital problems. Listening to each other and working to resolve conflicts are important in strengthening the family.

? Learning Activity

Watch this video—Baby Steps: Learn the Signs. Act Early:



Early recognition of developmental disabilities such as autism is key for parents and providers. CDC realized the impact on families and invested in a campaign to help parents measure their children's progress by monitoring how they play, learn, speak and act.

Sources

Source: Parenting, Medline Plus, http://www.nlm.nih.gov/medlineplus/parenting.html.

1. Name one important role of a parent in child development.
2. How can positive communication impact the parent-child relationship?
3. What is one challenge parents may face when raising children?

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3.6: Family and Societal Violence

Violence Prevention

Violence is a serious public health problem in the United States. From infants to the elderly, it affects people in all stages of life. In the United States, violence accounts for approximately 51,000 deaths annually. In 2007, more than 18,000 people were victims of homicide and more than 34,000 took their own life.

Estimating the size of this economic burden is helpful in understanding the resources that could be saved if cost-effective violence prevention efforts were applied. The cost of these deaths totaled to $47.2 billion ($47 billion in work loss costs and $215 million in medical treatment).

The number of violent deaths tells only part of the story. Many more survive violence and are left with permanent physical and emotional scars. Violence also erodes communities by reducing productivity, decreasing property values, and disrupting social services.Violence is a serious public health problem in the United States. From infants to the elderly, it affects people in all stages of life. In 2007, more than 18,000 people were victims of homicide and more than 34,000 took their own life.

Understanding Violence

Interpersonal violence is defined as the actual or threatened intentional use of force—physical, sexual, or emotional—against another person, group, or community. It may result in physical injury, psychological harm, or even death. Violence also includes suicide and nonfatal acts of self-harm.

Unfortunately, violence is a part of our daily life. It exists in all corners of our nation. It affects us all regardless of our age, gender, race, ethnicity, or socio-economic status. More than 50,000 violent deaths occur each year in the United States. The deaths only tell part of the story. Millions of others are left with debilitating physical and emotional injuries. These injuries negatively affect the health of victims for the rest of their lives.

Violence also erodes the fabric of our communities. It can threaten productivity in the workplace, decrease the value of our homes and businesses, and disrupt essential public and social services. The economic cost of violence is staggering. In 2000, the medical costs and productivity losses associated with nonfatal violence-related injuries and deaths were estimated at more than $70 billion each year. The total burden to society is far greater.

The good news is that violence is a problem with a solution. It can be prevented by using a thoughtful and systematic approach. While the field of violence prevention is still developing, our knowledge of “what works” increases every day.

Types of Violence

- Child Maltreatment (e.g., child abuse and neglect)
- Intimate Partner Violence (e.g., violence by a current or former spouse, boy/girlfriend)
- Sexual Violence (e.g., rape, sexual assault, sexual harassment)
- Suicide (e.g., fatal and nonfatal suicide behavior)
- Youth Violence (e.g., bullying, gang violence, peer violence)

? Learning Activity

Complete the Understanding Violence tutorial including each of the pop quizzes.

Sexual Violence

Sexual Violence (SV) refers to sexual activity where consent is not obtained or freely given. Anyone can experience SV, but most victims are female. The person responsible for the violence is typically male and is usually someone known to the victim. The person can be, but is not limited to, a friend, coworker, neighbor, or family member.

There are many types of SV. Not all include physical contact between the victim and the perpetrator (person who harms someone else)—for example, sexual harassment, threats, and peeping. Other SV, including unwanted touching and rape, includes physical contact.

SV can impact health in many ways. Some ways are serious and can lead to long-term health problems. These include chronic pain, headaches, stomach problems, and sexually transmitted diseases.

SV can have an emotional impact as well. Victims often are fearful and anxious. They may replay the attack over and over in their minds. They may have problems with trust and be wary of becoming involved with others. The anger and stress that victims feel may lead to eating disorders and depression. Some even think about or attempt suicide.

SV is also linked to negative health behaviors. For example, victims are more likely to smoke, abuse alcohol, use drugs, and engage in risky sexual activity.

Why is sexual violence a public health problem?

SV is a significant problem in the United States:

- Among high school students surveyed nationwide, about 8% reported having been forced to have sex. The percentage of those having been forced to ever have sex was higher among female (11%) than male (5%) students.
- An estimated 20% to 25% of college women in the United States have experienced an attempted or complete rape during their college career
- Nearly 1 in 5 women and 1 in 71 men in the United States have been raped at some time in their lives.

These numbers underestimate the problem. Many cases are not reported because victims are afraid to tell the police, friends, or family about the abuse.Victims also think that their stories of abuse will not be believed and that police cannot help them.They may be ashamed or embarrassed. Victims may also keep quiet because they have been threatened with further harm if they tell anyone.

Certain factors can increase the risk for SV. However, the presence of these factors does not mean that SV will occur.

Risk factors for perpetration (harm to someone else):

- Being male
- Having friends that are sexually aggressive
- Witnessing or experiencing violence as a child
- Alcohol or drug use
- Being exposed to social norms, or shared beliefs, that support sexual violence.

Definitions

It is important to understand what factors protect people or put them at risk for experiencing or perpetrating violence. Why are risk and protective factors useful? They help identify where prevention efforts need to be focused.

Risk factors do not cause violence. The presence of a risk factor does not mean that a person will always experience violence. Victims are never responsible for the harm inflicted upon them.

- Risk Factor—Characteristic that increases the likelihood of a person becoming a victim or perpetrator of violence.
- Protective Factor—Characteristic that decreases the likelihood of a person becoming a victim or perpetrator of violence because it provides a buffer against risk.

How can we prevent sexual violence?

The ultimate goal is to stop SV before it begins. Efforts at many levels are needed to accomplish this. Some examples include:

- Engaging high school students in mentoring programs or other skill-based activities that address healthy sexuality and dating relationships.
- Helping parents identify and address violent attitudes and behaviors in their kids.
- Creating policies at work, at school, and in other places that address sexual harassment.
- Developing mass media (e.g., radio, TV, magazines, newspapers) messages that promote norms, or shared beliefs, about healthy sexual relationships.

For more examples, see Sexual Violence Prevention: Beginning the Dialogue.

Sexual Violence: Risk and Protective Factors

Risk factors are associated with a greater likelihood of sexual violence (SV) perpetration. They are contributing factors and may or may not be direct causes. Not everyone who is identified as “at risk” becomes a perpetrator of violence.

A combination of individual, relational, community, and societal factors contribute to the risk of becoming a perpetrator of SV. Understanding these multilevel factors can help identify various opportunities for prevention.

Risk Factors for Perpetration

Individual Risk Factors

- Alcohol and drug use
- Coercive sexual fantasies
- Impulsive and antisocial tendencies
- Preference for impersonal sex
- Hostility towards women
- Hypermasculinity
- Childhood history of sexual and physical abuse
- Witnessed family violence as a child

Relationship Factors

- Association with sexually aggressive and delinquent peers
- Family environment characterized by physical violence and few resources
- Strong patriarchal relationship or familial environment
- Emotionally unsupportive familial environment

Community Factors

- Lack of employment opportunities
- Lack of institutional support from police and judicial system
- General tolerance of sexual violence within the community
- Weak community sanctions against sexual violence perpetrators

Societal Factors

- Poverty
- Societal norms that support sexual violence
- Societal norms that support male superiority and sexual entitlement
- Societal norms that maintain women’s inferiority and sexual submissiveness
- Weak laws and policies related to gender equity
- High tolerance levels of crime and other forms of violence

Sexual Violence: Prevention Strategies

Sexual violence is a serious problem that can have lasting, harmful effects on victims and their family, friends, and communities. The goal of sexual violence prevention is simple—to stop it from happening in the first place. However, the solutions are just as complex as the problem.

Prevention efforts should ultimately decrease the number of individuals who perpetrate sexual violence and the number of individuals who are sexual violence victims. Many prevention approaches aim to reduce risk factors and promote protective factors for sexual violence. In addition, comprehensive prevention strategies should address factors at each of the levels that influence sexual violence—the individual, relationship, community, and society.

The most common prevention strategies currently focus on the victim, the perpetrator, or bystanders.

- Strategies that aim to equip the victim with knowledge, awareness, or self-defense skills are referred to as risk reduction techniques.

- Strategies targeting the perpetrator attempt to change risk and protective factors for sexual violence in order to reduce the likelihood that an individual will engage in sexually violent behavior.
- The goal of bystander prevention strategies is to change social norms supporting sexual violence and empower men and women to intervene with peers to prevent an assault from occurring.
- Other prevention strategies may target social norms, policies, or laws in communities to reduce the perpetration of sexual violence across the population.

Effective and Promising Programs

Unfortunately, little is known about what works to prevent sexual violence. To date, only one prevention program, Safe Dates, has been shown in a randomized controlled trial to prevent or interrupt sexual violence perpetration. Other programs are accumulating evidence for effectiveness and are moving towards or are currently conducting rigorous evaluations. Until more is known about what works and for whom, program planners can use prevention principles to strengthen their approach and evaluation to determine the effectiveness of new or existing programs.

Understanding Intimate Partner Violence

Intimate partner violence (IPV) occurs between two people in a close relationship. The term “intimate partner” includes current and former spouses and dating partners. IPV exists along a continuum from a single episode of violence to ongoing battering.IPV includes four types of behavior:

- **Physical violence** is when a person hurts or tries to hurt a partner by hitting, kicking, or other type of physical force.
- **Sexual violence** is forcing a partner to take part in a sex act when the partner does not consent.
- **Threats of physical or sexual violence** include the use of words, gestures, weapons, or other means to communicate the intent to cause harm.
- **Emotional abuse** is threatening a partner or his or her possessions or loved ones, or harming a partner’s sense of self-worth. Examples are stalking, name-calling, intimidation, or not letting a partner see friends and family.

Often, IPV starts with emotional abuse. This behavior can progress to physical or sexual assault. Several types of IPV may occur together.

Why is IPV a public health problem?

- Nearly 3 in 10 women and 1 in 10 men in the US have experienced rape, physical violence, and/or stalking by a partner with IPV-related impact.
- IPV resulted in 2,340 deaths in 2007. Of these deaths, 70% were females and 30% were males.
- The medical care, mental health services, and lost productivity (e.g., time away from work) cost of IPV was an estimated $5.8 billion in 1995. Updated to 2003 dollars, that’s more than $8.3 billion.

These numbers underestimate the problem. Many victims do not report IPV to police, friends, or family. Victims may think others will not believe them or that the police cannot help.

How does IPV affect health?

IPV can affect health in many ways. The longer the violence goes on, the more serious the effects.

Many victims suffer physical injuries. Some are minor like cuts, scratches, bruises, and welts. Others are more serious and can cause death or disabilities. These include broken bones, internal bleeding, and head trauma.

Not all injuries are physical. IPV can also cause emotional harm. Victims may have trauma symptoms. This includes flashbacks, panic attacks, and trouble sleeping. Victims often have low self-esteem. They may have a hard time trusting others and being in relationships. The anger and stress that victims feel may lead to eating disorders and depression. Some victims even think about or commit suicide.

Who is at risk for IPV?

Several factors can increase the risk that someone will hurt his or her partner. However, having these risk factors does not always mean that IPV will occur.

- Being violent or aggressive in the past
- Seeing or being a victim of violence as a child
- Using drugs or alcohol, especially drinking heavily
- Not having a job or other life events that cause stress

Am I being abused?

It can be hard to know if you're being abused. You may think that your husband is allowed to make you have sex. That's not true. Forced sex is rape, no matter who does it. You may think that cruel or threatening words are not abuse. They are. And sometimes emotional abuse is a sign that a person will become physically violent.
Below is a list of possible signs of abuse. Some of these are illegal. All of them are wrong. You may be abused if your partner:

- Monitors what you're doing all the time
- Unfairly accuses you of being unfaithful all the time
- Prevents or discourages you from seeing friends or family
- Prevents or discourages you from going to work or school
- Gets very angry during and after drinking alcohol or using drugs
- Controls how you spend your money
- Controls your use of needed medicines
- Decides things for you that you should be allowed to decide (like what to wear or eat)
- Humiliates you in front of others
- Destroys your property or things that you care about
- Threatens to hurt you, the children, or pets
- Hurts you (by hitting, beating, pushing, shoving, punching, slapping, kicking, or biting)
- Uses (or threatens to use) a weapon against you
- Forces you to have sex against your will
- Controls your birth control or insists that you get pregnant
- Blames you for his or her violent outbursts
- Threatens to harm himself or herself when upset with you
- Says things like, "If I can't have you then no one can."

If you think someone is abusing you, get help. Abuse can have serious physical and emotional effects. No one has the right to hurt you.

Healthy vs. Unhealthy Relationships

Sometimes a relationship might not be abusive, but it might have some serious problems that make it unhealthy. If you think you might be in an unhealthy relationship, you should be able to talk to your partner about your concerns. If you feel like you can't talk to your partner, try talking to a trusted friend, family member, or counselor. Consider calling a confidential hotline to get the support you need and to explore next steps. If you're afraid to end the relationship, call a hotline for help.

Signs of an unhealthy relationship include:

- Focusing all your energy on your partner
- Dropping friends and family or activities you enjoy
- Feeling pressured or controlled a lot
- Having more bad times in the relationship than good
- Feeling sad or scared when with your partner

Signs of a healthy relationship include:

- Having more good times in the relationship than bad
- Having a life outside the relationship, with your own friends and activities
- Making decisions together, with each partner compromising at times
- Dealing with conflicts by talking honestly

- Feeling comfortable and able to be yourself
- Feeling able to take care of yourself
- Feeling like your partner supports you

If you feel confused about your relationship, a mental health professional can help. Remember, you deserve to be treated with respect.

? Learning Activity: Unhealthy Relationships

It can be hard to know what to do when someone you care about is in a controlling or violent relationship.
If this topic is unfamiliar to you and seems overwhelming, visit Help Someone in an Unhealthy Relationship: Quick tips.

? Learning Activity: Take Action

Visit this website then click on The Basics and Take Action Take Steps to Protect Yourself from Relationship Violence

What specific ways are you willing and able to help someone who is in an unhealthy relationship?

Sources

Violence Prevention: Violence Prevention, CDC, http://www.cdc.gov/ViolencePrevention/index.html.

Understanding Violence: Veto Violence, www.vetoviolence.org/basics-violence.html.

Sexual Violence: Violence Prevention, Centers for Disease Control and Prevention, http://www.cdc.gov/ViolencePrevention/sexualviolence/index.html.

Definitions: Definitions, CDC, www.cdc.gov/ViolencePrevention/overview/publichealthapproach.html.

How can we prevent sexual violence?: Understanding Sexual Violence, Centers for Disease Control and Prevention, www.cdc.gov/ViolencePrevention/pdf/SV_Factsheet-a.pdf.

Sexual Violence: Risk and Protective Factors: Sexual Violence: Risk and Protective Factors, Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention, http://www.cdc.gov/ViolencePrevention/sexualviolence/riskprotectivefactors.html.

Am I being abused?: Am I Being Abused? CDC, womenshealth.gov/violence-against-women/am-i-being-abused.

? Ex

1. What is one form of family violence?
2. How can societal violence affect communities?
3. Name one resource or strategy to prevent or address violence.

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CHAPTER OVERVIEW

4: Human Sexuality, Contraception, and Reproduction

4.1: Behavioral Presentation of Human Sexuality

4.2: Sexual Bias and Misconceptions

4.3: Contraception

4.4: Reproduction

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4.1: Behavioral Presentation of Human Sexuality

Sexual Health

Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence.

Sexuality

Sexuality is a big part of being human. Love, affection and sexual intimacy all play a role in healthy relationships. They also contribute to your sense of well-being. A number of disorders can affect the ability to have or enjoy sex in both men and women. Concerns about infertility or fear of unplanned pregnancy can also come into play. In addition, a number of diseases and disorders affect sexual health. These include sexually transmitted diseases and cancer. In men, treatment of prostate cancer can cause erectile dysfunction. In women, cervical, uterine, vaginal, vulvar, or ovarian cancer may have sexual effects.

Public Health Approach to Sexual Health

Sexuality affects individuals and society across a broad spectrum of activities: through health, but also through factors at multiple levels, such as gender relations, reproduction, and economics. Physiologic, behavioral, and affective measurement of sexuality and sexual behavior is complicated by cultural values and norms, but is essential to individual health (including happiness) as well as public health.

Stigma

Cultural or structural norms that stigmatize aspects of sexuality, such as sexual orientation, have adverse effects on individuals across their lifespan, with homophobia being a prominent example of such. In addition, survey data reveal several individual and relationship factors that are important to sexual health at all levels, with overall health noted as the greatest predictor of sexual satisfaction.

Infidelity

Sexuality is important to society not only because of health implications; it also affects gender and property relations, reproduction potential, and economics. Physical, mental, social, and cultural factors affect health, especially sexual health. For instance, infidelity between couples often leads to hurt and divorce, and in Western countries, between 25% and 50% of divorcees cite a spouse’s infidelity as the primary cause of divorce.

Sexual Dysfunction

Sexual dysfunction can pose public health problems, as it is related to public health issues and affects people’s happiness and general well-being.

According to the National Health and Social Life Survey,

- The prevalence of sexual dysfunction was found to be higher among women than men.
- Lack of sexual desire is the most common problem among women
- For men, the most common sexual problem is premature ejaculation, not erectile dysfunction.
- Sexual problems increase with age, but sex-related personal distress decreases.

Sexual Frequency

Sexual frequency is important for sexual relationship satisfaction. Sexual intercourse frequency is noted as being the most important factor when predicting sexual satisfaction. Satisfaction declines with age but not as steeply as sexual frequency declines. However, although satisfaction is lower in women, satisfaction levels do not change over time among women, compared with men.

Sex and Health

Duration and age matter, but health matters most of all. Health proves to be a critical predictor of sexual satisfaction. Among those indicating their health is at least “very good,” more than half say they are satisfied with their sex lives. The majority of older

Americans do not practice safe sex, even if they have multiple partners. It was reported that only 1 in 5 sexually active, dating singles use condoms regularly. Many older Americans report dating more than one person at a time and being sexually active with more than one sex partner (6% of men and 1% of women).

There are cultural differences that affect sexual and romantic happiness. Despite having a lower overall reported health rating, Hispanics report being happier with their sex lives compared with the general population. Sexuality was found to be a higher priority for older Hispanics, who report higher levels of sexual activity and satisfaction. Having a partner matters.

Sexual Happiness

The most important indicator of the sexual happiness of older Americans is having a steady sex partner. That indicator is less important than the frequency of sexual intercourse, good health, low levels of stress, and the absence of financial worries. There are still behavioral differences between older men and women, and older men and women continue to rank the importance of sex and the enjoyment of sex differently—even as they age. Older men continue to have more sex and think about sex more than older women; they see it as more important to their quality of life. Older men report having more frequent orgasms than women (2 out of 3 men, compared with 1 in 3 women), but their frequency of orgasm drops with age. Older men are twice as likely (21% compared with 11%) to admit sexual activity outside their relationship than women.

Sex Trafficking

Sex trafficking is a modern-day form of slavery in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such an act is under the age of 18 years. Enactment of the Trafficking Victims Protection Act of 2000 (TVPA) made sex trafficking a serious violation of Federal law. The TVPA also recognizes labor trafficking, which is discussed in a separate fact sheet.

As defined by the TVPA, the term ‘commercial sex act’ means any sex act on account of which anything of value is given to or received by any person.

The TVPA recognizes that traffickers use psychological and well as physical coercion and bondage, and it defines coercion to include: threats of serious harm to or physical restraint against any person; any scheme, plan, or pattern intended to cause a person to believe that failure to perform an act would result in serious harm to or physical restraint against any person; or the abuse or threatened abuse of the legal process.

Victims of Sex Trafficking and What They Face

Victims of sex trafficking can be women or men, girls or boys, but the majority are women and girls. There are a number of common patterns for luring victims into situations of sex trafficking, including:

- A promise of a good job in another country
- A false marriage proposal turned into a bondage situation
- Being sold into the sex trade by parents, husbands, boyfriends
- Being kidnapped by traffickers

Sex traffickers frequently subject their victims to debt-bondage, an illegal practice in which the traffickers tell their victims that they owe money (often relating to the victims’ living expenses and transport into the country) and that they must pledge their personal services to repay the debt.

Sex traffickers use a variety of methods to “condition” their victims including starvation, confinement, beatings, physical abuse, rape, gang rape, threats of violence to the victims and the victims’ families, forced drug use and the threat of shaming their victims by revealing their activities to their family and their families’ friends.

Victims face numerous health risks. Physical risks include drug and alcohol addiction; physical injuries (broken bones, concussions, burns, vaginal/anal tearings); traumatic brain injury (TBI) resulting in memory loss, dizziness, headaches, numbness; sexually transmitted diseases (e.g., HIV/AIDS, gonorrhea, syphilis, UTIs, pubic lice); sterility, miscarriages, menstrual problems; other diseases (e.g., TB, hepatitis, malaria, pneumonia); and forced or coerced abortions.

Psychological harms include mind/body separation/disassociated ego states, shame, grief, fear, distrust, hatred of men, self-hatred, suicide, and suicidal thoughts. Victims are at risk for Posttraumatic Stress Disorder (PTSD)—acute anxiety, depression, insomnia,

physical hyper-alertness, self-loathing that is long-lasting and resistant to change (complex-PTSD).

Victims may also suffer from traumatic bonding—a form of coercive control in which the perpetrator instills in the victim fear as well as gratitude for being allowed to live.

Types of Sex Trafficking

Victims of trafficking are forced into various forms of commercial sexual exploitation including prostitution, pornography, stripping, live-sex shows, mail-order brides, military prostitution and sex tourism.Victims trafficked into prostitution and pornography are usually involved in the most exploitive forms of commercial sex operations. Sex trafficking operations can be found in highly-visible venues such as street prostitution, as well as more underground systems such as closed-brothels that operate out of residential homes. Sex trafficking also takes place in a variety of public and private locations such as massage parlors, spas, strip clubs and other fronts for prostitution. Victims may start off dancing or stripping in clubs and then be coerced into situations of prostitution and pornography.

? Learning Activity: Identifying and Interacting With Victims of Human Trafficking

Find out about how to identify and interact with victims of human trafficking.

- What would you do if you think you identified someone who might be a victim of human trafficking?

Sources

Sexual Health: Sexual Health, CDC, http://www.cdc.gov/sexualhealth/

Sexuality: Sexuality, NLM, NIH, http://www.nlm.nih.gov/medlineplus/sexualhealth.html

Public Health Approach to Sexual Health: Public Health Approaches to Sexual Health, Centers for Disease Control and Prevention. A Public Health Approach for Advancing Sexual Health in the United States: Rationale and Options for Implementation, Meeting Report of an External Consultation. Atlanta, Georgia: Centers for Disease Control and Prevention; December, 2010. http://www.cdc.gov/sexualhealth/docs/SexualHealthReport-2011-508.pdf

Sex Trafficking: Sex Trafficking Fact Sheet, Administration for Children and Families, USDHHS, www.acf.hhs.gov/trafficking/about/fact_sex.html

? Exercise 4.1.1

- **Discuss how an individual's overall health influences sexual satisfaction and explain why it may be a stronger predictor than age-related changes in sexual frequency.**
- **What are the most common sexual dysfunctions for women and men, and how does the experience of personal distress related to these issues tend to evolve with age?**
- **Explain the role of cultural stigma in sexual health and satisfaction. How do societal norms around sexual orientation contribute to negative outcomes?**

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4.2: Sexual Bias and Misconceptions

Lesbian, Gay, Bisexual, and Transgender Health

People who are lesbian, gay, bisexual, or transgender (LGBT) are members of every community. They are diverse, come from all walks of life, and include people of all races and ethnicities, all ages, all socioeconomic statuses, and from all parts of the country. The perspectives and needs of LGBT people should be routinely considered in public health efforts to improve the overall health of every person and eliminate health disparities.

In addition to considering the needs of LGBT people in programs designed to improve the health of entire communities, there is also a need for culturally competent medical care and prevention services that are specific to this population. Social inequality is often associated with poorer health status, and sexual orientation has been associated with multiple health threats. Members of the LGBT community are at increased risk for a number of health threats when compared to their heterosexual peers. Differences in sexual behavior account for some of these disparities, but others are associated with social and structural inequities, such as the stigma and discrimination that LGBT populations experience.

? Learning Activity: Embrace Diversity in School

Watch this 4-minute video, Embrace diversity in school: say no to HIV-related stigma and other forms of discrimination:



What are the challenges an HIV positive student, gay or lesbian student faces at school?

Public Health Approach for Advancing Sexual Health

Lesbian, Gay, Bisexual, and Transgender (LGBT) sexual health and well-being is affected by numerous social and cultural challenges across the life course, contributing to negative health outcomes and posing barriers to attain such protective health indicators as marriage and family formation, community support, and inclusion in faith communities.

? Key Takeaways

It is critical to ask the right questions. The fundamental issue we face in this field is not “What is wrong with LGBT people,” but rather “What is right with them?” Homophobia has proven to be a structural norm in the United States.

The incidence of hate crimes, continued discrimination promulgated though denial of marriage rights, and policies such as, “don’t ask, don’t tell,” in the armed forces contribute to the continuation of homophobia as a structural norm. Psychological, interpersonal, and cultural scripts perpetuate attitudes that homophobia is normal, that discrimination is okay, and that high levels of society approve of homophobia. As a result of cultural and societal discriminations, LGBT people suffer an added burden of stress and experience health disparities.

U.S. culture has historically disapproved of LGBT people as evidenced by “sodomy” laws and institutional recognition that homosexuality was a psychiatric disorder. In addition, the LGBT population experiences health disparities and minority-related

stress based on their marginalized social status. Sexual attraction is established early, and LGBT youth are susceptible to the added burden of emotional and physical trauma.Some research suggests that sexual attraction is established by the ages of 9–10 years in humans. Around the ages of 13–14 years, young LGBT persons typically have their first sexual experience (13.5 for males, 15.5 for females). However, some studies have indicated that many young LGBT persons aspire to save themselves for love or more committed relationships when they are older. Societal values and norms may preclude sexual expression, as LGBT youth are stigmatized early. Young gay men experience disproportionate rates of sexual victimization and pre-pubertal LGBT youth are often marginalized or victimized in schools. Violence and harassment against LGBT students is widespread.

Knowledge of young adult sexual behavior and related negative health outcomes proves to be critical when implementing interventions to ensure the health of this population. The majority of new HIV diagnoses are made in young MSM, with the bulk occurring in black and Latino MSM. The Internet is used as a source of sexual health information, pornography, and as a main source for “hooking up” in the MSM population. Also, recent research indicates that women are more sexually fluid, changing lesbian identification and indicating a higher degree of bisexuality. LGBT seniors face many barriers to successful aging. Unlike heterosexuals, LGBT seniors can’t count on legal and biological families, which poses a tremendous challenge when assessing basic needs as they age. Further, along with incurring past and present stigmas, elderly LGBT are more likely to be more single and to have less good health care, and thus, must come to rely upon their friends or “families of choice” as a primary source of social support.

Gay and Bisexual Men’s Health

Gay and bisexual men and other men who have sex with men (MSM) represent an incredibly diverse community. Gay and bisexual men have both shared and unique experiences and circumstances that affect their physical health and mental health needs as well as their ability to receive high-quality health services.

Stigma and Discrimination

Homophobia, stigma, and discrimination persist in the United States and negatively affect the health and well-being of gay, bisexual, other men who have sex with men (MSM), and other members of the LGBT community. Homophobia, stigma, and discrimination are social determinants of health that can affect physical and mental health, whether MSM seek and are able to obtain health services, and the quality of the services they receive. Such barriers to health need to be addressed at different levels of society, such as health care settings, work places, and schools in order to increase opportunities for improving the health of MSM.

Homophobia and stigma persist in the United States even though acceptance of same-sex relationships has been steadily increasing. For example, a Gallup poll conducted in May 2010 found that more than half (52%) of Americans believed that gay and lesbian relationships were acceptable. Forty-three percent of Americans believed that gay and lesbian relationships are not morally acceptable.

The Effects of Negative Attitudes About Homosexuality

Negative attitudes about homosexuality can lead to rejection by friends and family, discriminatory acts and violence that harm specific individuals, and laws and policies that adversely affect the lives of many people; this can have damaging effects on the health of MSM and other sexual minorities. Homophobia, stigma and discrimination can:

- Limit MSM’s ability to access high quality health care that is responsive to health issues of MSM
- Affect income, employment status, and the ability to get and keep health insurance
- Contribute to poor mental health and unhealthy behaviors, such as substance abuse, risky sexual behaviors, and suicide attempts
- Affect MSM’s ability to establish and maintain long-term same-sex relationships that reduce HIV & STD risk
- Make it difficult for some MSM to be open about same-sex behaviors with others, which can increase stress, limit social support, and negatively affect health

The effects of homophobia, stigma and discrimination can be especially hard on adolescents and young adults. Young MSM and other sexual minorities are at increased risk of being bullied in school. They are also at risk of being rejected by their families and, as a result, are at increased risk of homelessness. A study published in 2009 compared gay, lesbian, and bisexual young adults who experienced strong rejection from their families with their peers who had more supportive families. The researchers found that those who experienced stronger rejection were:

- 8.4 times more likely to have tried to commit suicide
- 5.9 times more likely to report high levels of depression
- 3.4 times more likely to use illegal drugs
- 3.4 times more likely to have risky sex

Reducing the Effects of Stigma and Discrimination

MSM and their family and friends can take steps to reduce the effects of homophobia, stigma and discrimination and protect their physical and mental health. One way to cope with the stress from stigma and discrimination is social support. Some studies show that gay men who have good social support—from family, friends, and the wider gay community—have:

- higher self-esteem
- a more positive group identity

? Learning Activity: Bullying of Gay and Lesbian Youth

Find out about the It Gets Better Project.

- Do you think that this campaign is effective in showing gay and lesbian youth that they are not alone and that they can get past bullying?
- Will this campaign help reduce suicide and attempted suicide among gay and lesbian youth caused by harassment?

Lesbian and Bisexual Women's Health

What challenges do lesbian and bisexual women face in the health care system?

Lesbians and bisexual women face unique problems within the health care system that an hurt their health. Many health care professionals have not had enough training to know the specific health issues that lesbians and bisexuals face. They may not ask about sexual orientation when taking personal health histories. Health care professionals may not think that a lesbian or bisexual woman, like any woman, can be a healthy, normal female.

Things that can stop lesbians and bisexual women from getting good health care include:

- Being scared to tell your doctor about your sexuality or your sexual history
- Having a doctor who does not know your disease risks or the issues that affect lesbians and bisexual women
- Not having health insurance. Many lesbians and bisexuals don't have domestic partner benefits. This means that one person does not qualify to get health insurance through the plan that the partner has (a benefit usually available to married couples).
- Not knowing that lesbians are at risk for STIs and cancer

For these reasons, lesbian and bisexual women often avoid routine health exams. They sometimes even delay seeking health care when feeling sick. It is important to be proactive about your health, even if you have to try different doctors before you find the right one. Early detection—such as finding cancer early before it spreads—gives you the best chance to do something about it. That's one example of why it's important to find a doctor who will work with you to identify your health concerns and make a plan to address them.

Sources

Lesbian, Gay, Bisexual, and Transgender Health: Lesbian, Gay, Bisexual, and Transgendered Health, CDC, http://www.cdc.gov/lgbthealth/about.htm

Public Health Approach for Advancing Sexual Health: Public health Approach for Advancing Sexual Health,Centers for Disease Control and Prevention. A Public Health Approach for Advancing Sexual Health in the United States: Rationale and Options for Implementation, Meeting Report of an External Consultation. Atlanta, Georgia: Centers for Disease Control and Prevention; December, 2010. http://www.cdc.gov/sexualhealth/docs/SexualHealthReport-2011-508.pdf

Gay and Bisexual Men's Health: Gay and Bisexual Men's Health, Centers for Disease Control and Prevention, http://www.cdc.gov/msmhealth/

Stigma and Discrimination: Gay and Bisexual Men's Health, CDC, http://www.cdc.gov/msmhealth/stigma-and-discrimination.htm

Lesbian and Bisexual Women's Health: Lesbian and Bisexual Women's Health, NIH, womenshealth.gov/publications/our-publications/fact-sheet/lesbian-bisexual-health.cfm

? Exercise 4.2.1

1. Name one major organ in the male reproductive system and its function.
2. Name one major organ in the female reproductive system and its function.
3. Why is understanding reproductive anatomy important for overall health?

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4.3: Contraception

> In 2008, there were 6.4 million pregnancies to the 62 million women of reproductive age (15–44) in the United States. Sixty-six percent of these pregnancies resulted in live births and 19% in induced abortions. And, nearly half of pregnancies among American women—more than three million each year—are unintended.
>
> —Guttmacher Institute

Unintended Pregnancy

An unintended pregnancy is a pregnancy that is either mistimed or unwanted at the time of conception. It is a core concept in understanding the fertility of populations and the unmet need for contraception. Unintended pregnancy is associated with an increased risk of morbidity for women, and with health behaviors during pregnancy that are associated with adverse effects. For example, women with an unintended pregnancy may delay prenatal care, which may affect the health of the infant. Women of all ages may have unintended pregnancies, but some groups, such as teens, are at a higher risk.

Efforts to decrease unintended pregnancy include finding better forms of contraception, and increasing contraceptive use and adherence.

What is contraception?

Contraception, also known as birth control, is designed to prevent pregnancy. Some types of birth control include (but are not limited to):

- Barrier methods, such as condoms, the diaphragm, and the cervical cap, are designed to prevent the sperm from reaching the egg for fertilization.Intrauterine device, or IUD, is a small device that is inserted into the uterus by a health care provider. The IUD prevents a fertilized egg from implanting in the uterus. An IUD can stay in the uterus for up to 10 years until it is removed by a health care provider.
- Hormonal birth control, such as birth control pills, injections, skin patches, and vaginal rings, release hormones into a woman's body that interfere with fertility by preventing ovulation, fertilization, or implantation.
- Sterilization is a method that permanently prevents a woman from getting pregnant or a man from being able to get a woman pregnant. Sterilization involves surgical procedures that must be done by a health care provider and usually cannot be reversed.

The choice of birth control depends on factors such as a person's overall health, age, frequency of sexual activity, number of sexual partners, desire to have children in the future, and family history of certain diseases. A woman should talk to her health care provider about her choice of birth control method.

It is important to remember that even though birth control methods can prevent pregnancy, they do not all protect against sexually transmitted diseases or HIV.

Contraception Methods

There is no "best" method of birth control. Each method has its pros and cons.

All women and men can have control over when, and if, they become parents. Making choices about birth control, or contraception, isn't easy. There are many things to think about. To get started, learn about birth control methods you or your partner can use to prevent pregnancy. You can also talk with your doctor about the choices.

Before choosing a birth control method, think about:

- Your overall health
- How often you have sex
- The number of sex partners you have
- If you want to have children someday
- How well each method works to prevent pregnancy
- Possible side effects
- Your comfort level with using the method

What are the different types of birth control?

You can choose from many methods of birth control. They are grouped by how they work:

Continuous abstinence

This means not having sex (vaginal, anal, or oral) *at any time*. It is the only sure way to prevent pregnancy and protect against sexually transmitted infections (STIs), including HIV.

Natural family planning/rhythm method

This method is when you do not have sex or use a barrier method on the days you are most fertile (most likely to become pregnant). You can read about barrier methods in the following chart.

A woman who has a regular menstrual cycle has about 9 or more days each month when she is able to get pregnant. These fertile days are about 5 days before and 3 days after ovulation, as well as the day of ovulation.

To have success with this method, you need to learn about your menstrual cycle. Then you can learn to predict which days you are fertile or "unsafe." To learn about your cycle, keep a written record of:

- When you get your period
- What it is like (heavy or light blood flow)
- How you feel (sore breasts, cramps)

This method also involves checking your cervical mucus and recording your body temperature each day. Cervical mucus is the discharge from your vagina. You are most fertile when it is clear and slippery like raw egg whites. Use a basal thermometer to take your temperature and record it in a chart. Your temperature will rise 0.4 to 0.8° F on the first day of ovulation. You can talk with your doctor or a natural family planning instructor to learn how to record and understand this information.

Barrier methods—put up a block, or barrier, to keep sperm from reaching the egg

Contraceptive Sponge

Before having sex, you wet the sponge and place it, loop side down, inside your vagina to cover the cervix. The sponge is effective for more than one act of intercourse for up to 24 hours. It needs to be left in for at least 6 hours after having sex to prevent pregnancy. It must then be taken out within 30 hours after it is inserted.

Only one kind of contraceptive sponge is sold in the United States. It is called the Today Sponge. Women who are sensitive to the spermicide nonoxynol-9 should not use the sponge.

Diaphragm, cervical cap, and cervical shield

These barrier methods block the sperm from entering the cervix (the opening to your womb) and reaching the egg.

- The diaphragm is a shallow latex cup.
- The cervical cap is a thimble-shaped latex cup. It often is called by its brand name, FemCap.
- The cervical shield is a silicone cup that has a one-way valve that creates suction and helps it fit against the cervix. It often is called by its brand name, Lea's Shield.

The diaphragm and cervical cap come in different sizes, and you need a doctor to "fit" you for one. The cervical shield comes in one size, and you will not need a fitting.

Before having sex, add spermicide (to block or kill sperm) to the devices. Then place them inside your vagina to cover your cervix. You can buy spermicide gel or foam at a drug store.

All three of these barrier methods must be left in place for 6 to 8 hours after having sex to prevent pregnancy. The diaphragm should be taken out within 24 hours. The cap and shield should be taken out within 48 hours.

Female condom

This condom is worn by the woman inside her vagina. It keeps sperm from getting into her body. It is made of thin, flexible, manmade rubber and is packaged with a lubricant. It can be inserted up to 8 hours before having sex. Use a new condom each time you have intercourse. And don't use it and a male condom at the same time.

Male condom

Male condoms are a thin sheath placed over an erect penis to keep sperm from entering a woman's body. Condoms can be made of latex, polyurethane, or "natural/lambskin". The natural kind do not protect against STIs. Condoms work best when used with a vaginal spermicide, which kills the sperm. And you need to use a new condom with each sex act.

Condoms are either:

- Lubricated, which can make sexual intercourse more comfortable
- Non-lubricated, which can also be used for oral sex. It is best to add lubrication to non-lubricated condoms if you use them for vaginal or anal sex. You can use a water-based lubricant, such as K-Y jelly. You can buy them at the drug store. Oil-based lubricants like massage oils, baby oil, lotions, or petroleum jelly will weaken the condom, causing it to tear or break.

Keep condoms in a cool, dry place. If you keep them in a hot place (like a wallet or glove compartment), the latex breaks down. Then the condom can tear or break.

Hormonal methods

These methods prevent pregnancy by interfering with ovulation, fertilization, and/or implantation of the fertilized egg.

Oral contraceptives—combined pill ("The pill")

The pill contains the hormones estrogen and progestin. It is taken daily to keep the ovaries from releasing an egg. The pill also causes changes in the lining of the uterus and the cervical mucus to keep the sperm from joining the egg.

Some women prefer the "extended cycle" pills. These have 12 weeks of pills that contain hormones (active) and 1 week of pills that don't contain hormones (inactive). While taking extended cycle pills, women only have their period three to four times a year.

Many types of oral contraceptives are available. Talk with your doctor about which is best for you.
Your doctor may advise you not to take the pill if you:

- Are older than 35 and smoke
- Have a history of blood clots
- Have a history of breast, liver, or endometrial cancer

Antibiotics may reduce how well the pill works in some women. Talk to your doctor about a backup method of birth control if you need to take antibiotics.

Women should wait three weeks after giving birth to begin using birth control that contains both estrogen and progestin. These methods increase the risk of dangerous blood clots that could form after giving birth. Women who delivered by cesarean section or have other risk factors for blood clots, such as obesity, history of blood clots, smoking, or preeclampsia, should wait six weeks.

The patch

Also called by its brand name, Ortho Evra, this skin patch is worn on the lower abdomen, buttocks, outer arm, or upper body. It releases the hormones progestin and estrogen into the bloodstream to stop the ovaries from releasing eggs in most women. It also thickens the cervical mucus, which keeps the sperm from joining with the egg. You put on a new patch once a week for 3 weeks. You don't use a patch the fourth week in order to have a period.

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Shot/injection

The birth control shot often is called by its brand name Depo-Provera. With this method you get injections, or shots, of the hormone progestin in the buttocks or arm every 3 months. A new type is injected under the skin. The birth control shot stops the ovaries from releasing an egg in most women. It also causes changes in the cervix that keep the sperm from joining with the egg.

Vaginal ring

This is a thin, flexible ring that releases the hormones progestin and estrogen. It works by stopping the ovaries from releasing eggs. It also thickens the cervical mucus, which keeps the sperm from joining the egg.

It is commonly called NuvaRing, its brand name. You squeeze the ring between your thumb and index finger and insert it into your vagina. You wear the ring for 3 weeks, take it out for the week that you have your period, and then put in a new ring.

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Implantable devices

These devices are inserted into the body and left in place for a few years.

Implantable rod

This is a matchstick-size, flexible rod that is put under the skin of the upper arm. It is often called by its brand name, Implanon. The rod releases a progestin, which causes changes in the lining of the uterus and the cervical mucus to keep the sperm from joining an egg. Less often, it stops the ovaries from releasing eggs. It is effective for up to 3 years.

Intrauterine devices or IUDs

An IUD is a small device shaped like a “T” that goes in your uterus. There are two types:

- **Copper IUD** The copper IUD goes by the brand name ParaGard. It releases a small amount of copper into the uterus, which prevents the sperm from reaching and fertilizing the egg. It fertilization does occur, the IUD keeps the fertilized egg from implanting in the lining of the uterus. A doctor needs to put in your copper IUD. It can stay in your uterus for 5 to 10 years.
- **Hormonal IUD** The hormonal IUD goes by the brand name Mirena. It is sometimes called an intrauterine system, or IUS. It releases progestin into the uterus, which keeps the ovaries from releasing an egg and causes the cervical mucus to thicken so sperm can’t reach the egg. It also affects the ability of a fertilized egg to successfully implant in the uterus. A doctor needs to put in a hormonal IUD. It can stay in your uterus for up to 5 years.

Sterilization implant (essure)

Essure is the first non-surgical method of sterilizing women. A thin tube is used to thread a tiny spring-like device through the vagina and uterus into each fallopian tube. The device works by causing scar tissue to form around the coil. This blocks the fallopian tubes and stops the egg and sperm from joining.

It can take about 3 months for the scar tissue to grow, so it’s important to use another form of birth control during this time. Then you will have to return to your doctor for a test to see if scar tissue has fully blocked your tubes.

Surgical sterilization

For women, surgical sterilization closes the fallopian tubes by being cut, tied, or sealed. This stops the eggs from going down to the uterus where they can be fertilized. The surgery can be done a number of ways. Sometimes, a woman having cesarean birth has the procedure done at the same time, so as to avoid having additional surgery later.

For men, having a vasectomy keeps sperm from going to his penis, so his ejaculate never has any sperm in it. Sperm stays in the system after surgery for about 3 months. During that time, use a backup form of birth control to prevent pregnancy. A simple test can be done to check if all the sperm is gone; it is called a semen analysis.

Emergency contraception

Used if a woman’s primary method of birth control fails. It should *not* be used as a regular method of birth control. Emergency contraception (Plan B One-Step or Next Step. It is also called the “morning after pill.”)

Emergency contraception keeps a woman from getting pregnant when she has had unprotected vaginal intercourse. “Unprotected” can mean that no method of birth control was used. It can also mean that a birth control method was used but it was used

incorrectly, or did not work (like a condom breaking). Or, a woman may have forgotten to take her birth control pills. She also may have been abused or forced to have sex. These are just some of the reasons women may need emergency contraception.

Emergency contraception can be taken as a single pill treatment or in two doses. A single dose treatment works as well as two doses and does not have more side effects. It works by stopping the ovaries from releasing an egg or keeping the sperm from joining with the egg. For the best chances for it to work, take the pill as soon as possible after unprotected sex. It should be taken within 72 hours after having unprotected sex.

A single-pill dose or two-pill dose of emergency contraception is available over-the-counter (OTC) for women ages 17 and older.

Can all types of birth control prevent sexually transmitted infections (STIs)?

No. The male latex condom is the *only* birth control method proven to help protect you from STIs, including HIV. Research is being done to find out how effective the female condom is at preventing STIs and HIV. For more information, see Will birth control pills protect me from sexually transmitted infections (STIs), including HIV/AIDS?

How well do different kinds of birth control work? Do they have side effects?

All birth control methods work the best if used correctly and every time you have sex. Be sure you know the right way to use them. Sometimes doctors don't explain how to use a method because they assume you already know. Talk with your doctor if you have questions. They are used to talking about birth control. So don't feel embarrassed about talking to him or her.

Some birth control methods can take time and practice to learn. For example, some people don't know you can put on a male condom "inside out." Also, not everyone knows you need to leave a little space at the tip of the condom for the sperm and fluid when a man ejaculates, or has an orgasm.

Where to Get Birth Control

Where you get birth control depends on what method you choose.

You can buy these forms over the counter:

- Male condoms
- Female condoms
- Sponges
- Spermicides
- Emergency contraception pills (girls younger than 17 need a prescription)

You need a prescription for these forms:

- Oral contraceptives: the pill, the mini-pill
- Skin patch
- Vaginal ring
- Diaphragm (your doctor needs to fit one to your shape)
- Cervical cap
- Cervical shield
- Shot/injection (you get the shot at your doctor's office)
- IUD (inserted by a doctor)
- Implantable rod (inserted by a doctor)

You will need surgery or a medical procedure for:

- Sterilization, female and male

Spermacides

You can buy spermicides over the counter. They work by killing sperm. They come in many forms:

- Foam
- Gel
- Cream

- Film
- Suppository
- Tablet

Spermicides are put in the vagina no more than 1 hour before having sex. If you use a film, suppository, or tablet, wait at least 15 minutes before having sex so the spermicide can dissolve. Do not douche or rinse out your vagina for at least 6 to 8 hours after having sex. You will need to use more spermicide each time you have sex.

Spermicides work best if used along with a barrier method, such as a condom, diaphragm, or cervical cap. Some spermicides are made just for use with the diaphragm and cervical cap. Check the package to make sure you are buying what you need.

All spermicides contain sperm-killing chemicals. Some contain nonoxynol-9, which may raise your risk of HIV if you use it a lot. It irritates the tissue in the vagina and anus, so it can cause the HIV virus to enter the body more freely. Some women are sensitive to nonoxynol-9 and need to use spermicides without it. Medications for vaginal yeast infections may lower the effectiveness of spermicides. Also, spermicides do not protect against sexually transmitted infections.

Withdrawal

Withdrawal is when a man takes his penis out of a woman's vagina (or "pulls out") before he ejaculates, or has an orgasm. This stops the sperm from going to the egg. "Pulling out" can be hard for a man to do. It takes a lot of self-control.

Even if you use withdrawal, sperm can be released *before* the man pulls out. When a man's penis first becomes erect, pre-ejaculate fluid may be on the tip of the penis. This fluid has sperm in it. So you could still get pregnant.

Withdrawal does not protect you from STIs or HIV.

Dental Dams

The dental dam is a square piece of rubber that is used by dentists during oral surgery and other procedures. It is not a method of birth control. But it can be used to help protect people from STIs, including HIV, during oral-vaginal or oral-anal sex. It is placed over the opening to the vagina or the anus before having oral sex. You can buy dental dams at surgical supply stores.

? Learning Activity

For a handy summary of birth control information, see this Frequently Asked Questions Fact Sheet.

? Learning Activity

Find out the Real Cost of Contraceptives: *"Choosing the most money-smart method isn't as easy as crunching numbers because costs depend on a variety of factors, including how long you want the birth control to last, how often you need it, and how generous your insurance policy is."*

- Which birth control methods are the most affordable? Why?

Sources

Unintended Pregnancy: Unintended Pregnancy, CDC, www.cdc.gov/reproductivehealth/UnintendedPregnancy/index.htm

What is contraception?: What is Contraception? NLM, NIH, http://www.nlm.nih.gov/medlineplus/birthcontrol.html

Contraception Methods: Contraception Methods, NIH, womenshealth.gov/publications/our-publications/fact-sheet/birth-control-methods.cfm

? Exercise 4.3.1

1. What is one hormonal method of contraception and how does it work?
2. Describe how barrier methods prevent pregnancy.
3. Why is choosing the right contraception method important?

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4.4: Reproduction

Reproductive Health

Both the male and female reproductive systems play a role in pregnancy. Problems with these systems can affect fertility and the ability to have children. There are many such problems in men and women.

Reproductive health problems can also be harmful to overall health and impair a person's ability to enjoy a sexual relationship.

Your reproductive health is influenced by many factors. These include your age, lifestyle, habits, genetics, use of medicines and exposure to chemicals in the environment. Many problems of the reproductive system can be corrected.

What is reproductive health?

Reproductive health includes a variety of topics, such as:

- Menstruation and menopause
- Pregnancy and preconception care
- Fertility/Infertility
- Contraception

More information on some of these issues is provided below.

Menstrual Cycle

The menstrual cycle is the process by which a woman's body gets ready for the chance of a pregnancy each month. The average menstrual cycle is 28 days from the start of one to the start of the next, but it can range from 21 days to 35 days.

Most menstrual periods last from three to five days. In the United States, most girls start menstruating at age 12, but girls can start menstruating between the ages of 8 and 16.

Menstruation and the menstrual cycle fact sheet

Menstruation is a woman's monthly bleeding. When you menstruate, your body sheds the lining of the uterus (womb). Menstrual blood flows from the uterus through the small opening in the cervix and passes out of the body through the vagina (see how the menstrual cycle works below). Most menstrual periods last from 3 to 5 days.

What is the menstrual cycle?

When periods (menstruations) come regularly, this is called the menstrual cycle. Having regular menstrual cycles is a sign that important parts of your body are working normally. The menstrual cycle provides important body chemicals, called hormones, to keep you healthy. It also prepares your body for pregnancy each month. A cycle is counted from the first day of 1 period to the first day of the next period. The average menstrual cycle is 28 days long. Cycles can range anywhere from 21 to 35 days in adults and from 21 to 45 days in young teens.

What happens during the menstrual cycle?

In the first half of the cycle, levels of estrogen (the female hormone) start to rise. Estrogen plays an important role in keeping you healthy, especially by helping you to build strong bones and to help keep them strong as you get older. Estrogen also makes the lining of the uterus (womb) grow and thicken. This lining of the womb is a place that will nourish the embryo if a pregnancy occurs. At the same time the lining of the womb is growing, an egg, or ovum, in one of the ovaries starts to mature. At about day 14 of an average 28-day cycle, the egg leaves the ovary. This is called ovulation.

After the egg has left the ovary, it travels through the fallopian tube to the uterus. Hormone levels rise and help prepare the uterine lining for pregnancy. A woman is most likely to get pregnant during the 3 days before or on the day of ovulation. Keep in mind, women with cycles that are shorter or longer than average may ovulate before or after day 14.

A woman becomes pregnant if the egg is fertilized by a man's sperm cell and attaches to the uterine wall. If the egg is not fertilized, it will break apart. Then, hormone levels drop, and the thickened lining of the uterus is shed during the menstrual period.

The Menstrual Cycle

- **Day 1** starts with the first day of your period. This occurs after hormone levels drop at the end of the previous cycle, signaling blood and tissues lining the uterus (womb) to break down and shed from the body. Bleeding lasts about 5 days.
- Usually by **Day 7**, bleeding has stopped. Leading up to this time, hormones cause fluid-filled pockets called follicles to develop on the ovaries. Each follicle contains an egg.
- Between **Day 7 and 14**, one follicle will continue to develop and reach maturity. The lining of the uterus starts to thicken, waiting for a fertilized egg to implant there. The lining is rich in blood and nutrients.
- Around **Day 14** (in a 28-day cycle), hormones cause the mature follicle to burst and release an egg from the ovary, a process called ovulation.
- Over the next few days, the egg travels down the fallopian tube towards the uterus. If a sperm unites with the egg here, the fertilized egg will continue down the fallopian tube and attach to the lining of the uterus.
- If the egg is not fertilized, hormone levels will drop around **Day 25**. This signals the next menstrual cycle to begin. The egg will break apart and be shed with the next period.

What is a typical menstrual period like?

During your period, you shed the thickened uterine lining and extra blood through the vagina. Your period may not be the same every month. It may also be different than other women's periods. Periods can be light, moderate, or heavy in terms of how much blood comes out of the vagina. This is called menstrual flow. The length of the period also varies. Most periods last from 3 to 5 days. But, anywhere from 2 to 7 days is normal.

For the first few years after menstruation begins, longer cycles are common. A woman's cycle tends to shorten and become more regular with age. Most of the time, periods will be in the range of 21 to 35 days apart.

What kinds of problems do women have with their periods?

Women can have a range of problems with their periods, including pain, heavy bleeding, and skipped periods.
Amenorrhea—the lack of a menstrual period. This term is used to describe the absence of a period in:

- Young women who haven't started menstruating by age 15
- Women and girls who haven't had a period for 90 days, even if they haven't been menstruating for long

Causes can include:

- Pregnancy
- Breastfeeding
- Extreme weight loss
- Eating disorders
- Excessive exercising
- Stress
- Serious medical conditions in need of treatment

As above, when your menstrual cycles come regularly, this means that important parts of your body are working normally. In some cases, not having menstrual periods can mean that your ovaries have stopped producing normal amounts of estrogen. Missing these hormones can have important effects on your overall health. Hormonal problems, such as those caused by polycystic ovary syndrome (PCOS) or serious problems with the reproductive organs, may be involved. It's important to talk to a doctor if you have this problem.

Dysmenorrhea (dis-men-uh-REE-uh)—painful periods, including severe cramps. Menstrual cramps in teens are caused by too much of a chemical called prostaglandin (pros-tuh-GLAN-duhn). Most teens with dysmenorrhea do not have a serious disease, even though the cramps can be severe. In older women, the pain is sometimes caused by a disease or condition such as uterine fibroids or endometriosis.

For some women, using a heating pad or taking a warm bath helps ease their cramps. Some over-the-counter pain medicines can also help with these symptoms. They include:

- Ibuprofen (for instance, Advil, Motrin, Midol Cramp>
- Ketoprofen (for instance, Orudis KT)
- Naproxen (for instance, Aleve)

If these medicines don't relieve your pain or the pain interferes with work or school, you should see a doctor. Treatment depends on what's causing the problem and how severe it is. Report vaginal bleeding that's different from normal menstrual periods. It includes:

- Bleeding between periods
- Bleeding after sex
- Spotting anytime in the menstrual cycle
- Bleeding heavier or for more days than normal
- Bleeding after menopause

Abnormal bleeding can have many causes. Your doctor may start by checking for problems that are most common in your age group. Some of them are not serious and are easy to treat. Others can be more serious. Treatment for abnormal bleeding depends on the cause.

In both teens and women nearing menopause, hormonal changes can cause long periods along with irregular cycles. Even if the cause is hormonal changes, you may be able to get treatment. You should keep in mind that these changes can occur with other serious health problems, such as uterine fibroids, polyps, or even cancer. See your doctor if you have any abnormal bleeding.

When does a girl usually get her first period?

In the United States, the average age for a girl to get her first period is 12. This does not mean that all girls start at the same age. A girl can start her period anytime between the ages of 8 and 15. Most of the time, the first period starts about 2 years after breasts first start to develop. If a girl has not had her first period by age 15, or if it has been more than 2 to 3 years since breast growth started, she should see a doctor.

Menopause

Women usually have periods until menopause. Menopause occurs between the ages of 45 and 55, usually around age 50. Menopause means that a woman is no longer ovulating (producing eggs) or having periods and can no longer get pregnant. Like menstruation, menopause can vary from woman to woman and these changes may occur over several years.

The time when your body begins its move into menopause is called the menopausal transition. This can last anywhere from 2 to 8 years. Some women have early menopause because of surgery or other treatment, illness, or other reasons. If you don't have a period for 90 days, you should see your doctor. He or she will check for pregnancy, early menopause, or other health problems that can cause periods to stop or become irregular.

When to Consult a Doctor about Your Period

See your doctor about your period if:

- You have not started menstruating by the age of 15.
- You have not started menstruating within 3 years after breast growth began, or if breasts haven't started to grow by age 13.
- Your period suddenly stops for more than 90 days.
- Your periods become very irregular after having had regular, monthly cycles.
- Your period occurs more often than every 21 days or less often than every 35 days.
- You are bleeding for more than 7 days.
- You are bleeding more heavily than usual or using more than 1 pad or tampon every 1 to 2 hours.
- You bleed between periods.
- You have severe pain during your period.
- You suddenly get a fever and feel sick after using tampons.

You should change a pad before it becomes soaked with blood. Each woman decides for herself what works best. You should change a tampon at least every 4 to 8 hours. Make sure to use the lowest absorbency tampon needed for your flow. For example, use junior or regular tampons on the lightest day of your period. Using a super absorbency tampon on your lightest days increases

your risk for toxic shock syndrome (TSS). TSS is a rare but sometimes deadly disease. TSS is caused by bacteria that can produce toxins. If your body can't fight the toxins, your immune (body defense) system reacts and causes the symptoms of TSS (see below).

Young women may be more likely to get TSS. Using any kind of tampon puts you at greater risk for TSS than using pads. The Food and Drug Administration (FDA) recommends the following tips to help avoid tampon problems:

- Follow package directions for insertion.
- Choose the lowest absorbency for your flow.
- Change your tampon at least every 4 to 8 hours.
- Consider switching between pads and tampons.
- Know the warning signs of TSS (see below).
- Don't use tampons between periods.

If you have any of these symptoms of TSS while using tampons, take the tampon out, and contact your doctor right away:

- Sudden high fever (over 102 degrees)
- Muscle aches
- Diarrhea
- Vomiting
- Dizziness and/or fainting
- Sunburn-like rash
- Sore throat
- Bloodshot eyes

Preconception Care

Why preconception health matters

Preconception health is a woman's health before she becomes pregnant. It means knowing how health conditions and risk factors could affect a woman or her unborn baby if she becomes pregnant. For example, some foods, habits, and medicines can harm your baby—even before he or she is conceived. Some health problems, such as diabetes, also can affect pregnancy.

Every woman should be thinking about her health whether or not she is planning pregnancy. One reason is that about half of all pregnancies are not planned. Unplanned pregnancies are at greater risk of preterm birth and low birth weight babies. Another reason is that, despite important advances in medicine and prenatal care, about 1 in 8 babies is born too early. Researchers are trying to find out why and how to prevent preterm birth. But experts agree that women need to be healthier before becoming pregnant. By taking action on health issues and risks before pregnancy, you can prevent problems that might affect you or your baby later.

Five most important things to boost your preconception health

Women and men should prepare for pregnancy before becoming sexually active—or at least three months before getting pregnant. Some actions, such as quitting smoking, reaching a healthy weight, or adjusting medicines you are using, should start even earlier.

The five most important things a woman can do for preconception health are:

1. Take 400 to 800 micrograms (400 to 800 mcg or 0.4 to 0.8 mg) of folic acid every day if you are planning or capable of pregnancy to lower your risk of some birth defects of the brain and spine, including spina bifida. All women need folic acid every day. Talk to your doctor about your folic acid needs. Some doctors prescribe prenatal vitamins that contain higher amounts of folic acid.
2. Stop smoking and drinking alcohol.
3. If you have a medical condition, be sure it is under control. Some conditions that can affect pregnancy or be affected by it include asthma, diabetes, oral health, obesity, or epilepsy.
4. Talk to your doctor about any over-the-counter and prescription medicines you are using. These include dietary or herbal supplements. Be sure your vaccinations are up to date.
5. Avoid contact with toxic substances or materials that could cause infection at work and at home. Stay away from chemicals and cat or rodent feces.

Talk to your doctor before you become pregnant

Did you know?

It's best to be at a healthy weight when you become pregnant. Being overweight or underweight puts you at increased risk for problems during pregnancy. Learn how healthy food choices and physical fitness, together, can help you reach or maintain a healthy weight.

Preconception care can improve your chances of getting pregnant, having a healthy pregnancy, and having a healthy baby. If you are sexually active, talk to your doctor about your preconception health now.

Preconception care should begin at least three months before you get pregnant. But some women need more time to get their bodies ready for pregnancy. Be sure to discuss your partner's health too. Ask your doctor about:

- Family planning and birth control.
- Taking folic acid.
- Vaccines and screenings you may need, such as a Pap test and screenings for sexually transmitted infections (STIs), including HIV.
- Managing health problems, such as diabetes, high blood pressure, thyroid disease, obesity, depression, eating disorders, and asthma. Find out how pregnancy may affect, or be affected by, health problems you have.
- Medicines you use, including over-the-counter, herbal, and prescription drugs and supplements.
- Ways to improve your overall health, such as reaching a healthy weight, making healthy food choices, being physically active, caring for your teeth and gums, reducing stress, quitting smoking, and avoiding alcohol.
- How to avoid illness.
- Hazards in your workplace or home that could harm you or your baby.
- Health problems that run in your or your partner's family.
- Problems you have had with prior pregnancies, including preterm birth.
- Family concerns that could affect your health, such as domestic violence or lack of support.

Bring a list of talking points to be sure you don't forget anything. If you run out of time at your visit, schedule a follow-up visit to make sure everything is covered.

Your partner's role in preparing for pregnancy

Your partner can do a lot to support and encourage you in every aspect of preparing for pregnancy. Here are some ways:

- Make the decision about pregnancy together. When both partners intend for pregnancy, a woman is more likely to get early prenatal care and avoid risky behaviors such as smoking and drinking alcohol.
- Screening for and treating sexually transmitted infections (STIs) can help make sure infections are not passed to female partners.
- Male partners can improve their own reproductive health and overall health by limiting alcohol, quitting smoking or illegal drug use, making healthy food choices, and reducing stress. Studies show that men who drink a lot, smoke, or use drugs can have problems with their sperm. These might cause you to have problems getting pregnant. If your partner won't quit smoking, ask that he not smoke around you, to avoid harmful effects of secondhand smoke.
- Your partner should also talk to his doctor about his own health, his family health history, and any medicines he uses.
- People who work with chemicals or other toxins can be careful not to expose women to them. For example, people who work with fertilizers or pesticides should change out of dirty clothes before coming near women. They should handle and wash soiled clothes separately.

Genetic counseling

Did you know?

Some companies offer genetic tests that you can do yourself through the mail. These tests may not provide true or meaningful information. These tests might provide harmful information. Talk to your doctor before using this type of test.

The genes your baby is born with can affect your baby's health in these ways:

- Single gene disorders are caused by a problem in a single gene. Genes contain the information your body's cells need to function. Single gene disorders run in families. Examples of single gene disorders are cystic fibrosis and sickle cell anemia.
- Chromosome disorders occur when all or part of a chromosome is missing or extra, or if the structure of one or more chromosomes is not normal. Chromosomes are structures where genes are located. Most chromosome disorders that involve whole chromosomes do not run in families.

Talk to your doctor about your and your partner's family health histories before becoming pregnant. This information can help your doctor find out any genetic risks you might have.

Depending on your genetic risk factors, your doctor might suggest you meet with a genetic professional. Some reasons a person or couple might seek genetic counseling are:

- A family history of a genetic condition, birth defect, chromosomal disorder, or cancer
- Two or more pregnancy losses, a stillbirth, or a baby who died
- A child with a known inherited disorder, birth defect, or intellectual disability
- A woman who is pregnant or plans to become pregnant at 35 years or older
- Test results that suggest a genetic condition is present
- Increased risk of getting or passing on a genetic disorder because of one's ethnic background
- People related by blood who want to have children together

During a consultation, the genetics professional meets with a person or couple to discuss genetic risks or to diagnose, confirm, or rule out a genetic condition. Sometimes, a couple chooses to have genetic testing. Some tests can help couples to know the chances that a person will get or pass on a genetic disorder. The genetics professional can help couples decide if genetic testing is the right choice for them.

? Learning Activity

Find out about direct-to-consumer genetic testing kits.

- Would you use a genetic test that you can do yourself through the mail? Why or why not?

What is pregnancy?

Pregnancy is the term used to describe when a woman has a growing fetus inside of her. In most cases, the fetus grows in the uterus.

Human pregnancy lasts about 40 weeks, or just more than 9 months, from the start of the last menstrual period to childbirth.

What are prenatal and preconception care and why are they important?

Prenatal care is the care woman gets during a pregnancy. Getting early and regular prenatal care is important for the health of both mother and the developing baby.

In addition, health care providers are now recommending a woman see a health care provider for preconception care, even before she considers becoming pregnant or in between pregnancies.

Knowing if you are pregnant

A missed period is often the first clue that a woman might be pregnant. Sometimes, a woman might suspect she is pregnant even sooner. Symptoms such as headache, fatigue, and breast tenderness, can occur even before a missed period. The wait to know can be emotional. These days, many women first use home pregnancy tests (HPT) to find out. Your doctor also can test you.

All pregnancy tests work by detecting a special hormone in the urine or blood that is only there when a woman is pregnant. It is called human chorionic gonadotropin (kohr-ee-ON-ihk goh-NAD-uh-TROH-puhn), or hCG. hCG is made when a fertilized egg implants in the uterus. hCG rapidly builds up in your body with each passing day you are pregnant. Read on to learn when and how to test for pregnancy.

Home pregnancy tests

Reading a home pregnancy test

HPTs are inexpensive, private, and easy to use. Most drugstores sell HPTs over the counter. The cost depends on the brand and how many tests come in the box. They work by detecting hCG in your urine. HPTs are highly accurate. But their accuracy depends on many things. These include:

- **When you use them—**The amount of hCG in your urine increases with time. So, the earlier after a missed period you take the test the harder it is to spot the hCG. Some HPTs claim that they can tell if you are pregnant one day after a missed period or even earlier. But a recent study shows that most HPTs don't give accurate results this early in pregnancy. Positive results are more likely to be true than negative results. Waiting one week after a missed period will usually give a more accurate result. You can take the test sooner. But just know that a lot of pregnant women will get negative test results during the first few days after the missed period. It's a good idea to repeat the test again after a week has passed. If you get two negative results but still think you're pregnant, call your doctor.
- **How you use them—**Be sure to check the expiration date and follow the directions. Many involve holding a test stick in the urine stream. For some, you collect urine in a cup and then dip the test stick into it. Then, depending on the brand, you will wait a few minutes to get the results. Research suggests waiting 10 minutes will give the most accurate result. Also, testing your urine first thing in the morning may boost the accuracy. You will be looking for a plus sign, a change in color, or a line. A change, whether bold or faint, means the result is positive. New digital tests show the words "pregnant" or "not pregnant." Most tests also have a "control indicator" in the results window. This line or symbol shows whether or not the test is working. If the control indicator does not appear, the test is not working properly. You should not rely on any results from a HPT that may be faulty.
- **Who uses them—**The amount of hCG in the urine is different for every pregnant woman. So, some women will have accurate results on the day of the missed period while others will need to wait longer. Also, some medicines affect HPTs. Discuss the medicines you use with your doctor before trying to become pregnant.
- **The brand of test—**Some HPT tests are better than others at spotting hCG early on.

The most important part of using any HPT is to follow the directions exactly as written. Most tests also have toll-free phone numbers to call in case of questions about use or results.

If a HPT says you are pregnant, you should call your doctor right away. Your doctor can use a more sensitive test along with a pelvic exam to tell for sure if you're pregnant. Seeing your doctor early on in your pregnancy can help you and your baby stay healthy.

Unplanned Pregnancy

Unplanned pregnancy is common. About 1 in 2 pregnancies in America are unplanned. Ideally, a woman who is surprised by an unplanned pregnancy is in good preconception health and is ready and able to care for a new child. But this sometimes isn't the case.

If you have an unplanned pregnancy, you might not know what to do next. You might worry that the father won't welcome the news. You might not be sure you can afford to care for a baby. You might worry if past choices you have made, such as drinking or drug use, will affect your unborn baby's health. You might be concerned that having a baby will keep you from finishing school or pursuing a career.

If you are pregnant after being raped, you might feel ashamed, numb, or afraid. Unplanned pregnancy is common among abused women. Research has found that some abusers force their partners to have sex without birth control and/or sabotage the birth control their partners are using, leading to unplanned pregnancy.

You might wonder what options you have. Here are some next steps to help you move forward:

- Start taking care of yourself right away. Take 400 to 800 micrograms (400 to 800 mcg or 0.4 to 0.8 mg) folic acid every. Stop alcohol, tobacco, and drug use.
- Make a doctor's visit to confirm your pregnancy. Discuss your health and issues that could affect your pregnancy. Ask for help quitting smoking. Find out what you can do to take care of yourself and your unborn baby.
- Ask your doctor to recommend a counselor who you can talk to about your situation.

- Seek support in someone you trust and respect.

Trying to Get Pregnant

How do you figure out when you're fertile and when you're not? Wondering if you or your partner is infertile? Read on to boost your chances of conception and get help for fertility problems.

Fertility awareness

The menstrual cycle

Being aware of your menstrual cycle and the changes in your body that happen during this time can help you know when you are most likely to get pregnant.

The average menstrual cycle lasts 28 days. But normal cycles can vary from 21 to 35 days. The amount of time before ovulation occurs is different in every woman and even can be different from month to month in the same woman, varying from 13 to 20 days long. Learning about this part of the cycle is important because it is when ovulation and pregnancy can occur. After ovulation, every woman (unless she has a health problem that affects her periods or becomes pregnant) will have a period within 14 to 16 days.

Charting your fertility pattern

Knowing when you're most fertile will help you plan pregnancy. There are three ways you can keep track of your fertile times. They are:

1. **Basal body temperature method**—Basal body temperature is your temperature at rest as soon as you awake in the morning. A woman's basal body temperature rises slightly with ovulation. So by recording this temperature daily for several months, you'll be able to predict your most fertile days.

Basal body temperature differs slightly from woman to woman. Anywhere from 96 to 98 degrees Fahrenheit orally is average before ovulation. After ovulation most women have an oral temperature between 97 and 99 degrees Fahrenheit. The rise in temperature can be a sudden jump or a gradual climb over a few days.

Usually a woman's basal body temperature rises by only 0.4 to 0.8 degrees Fahrenheit. To detect this tiny change, women must use a basal body thermometer. These thermometers are very sensitive. Most pharmacies sell them for about $10. You can then record your temperature on our special Basal Body Temperature Chart.

The rise in temperature doesn't show exactly when the egg is released. But almost all women have ovulated within three days after their temperatures spike. Body temperature stays at the higher level until the woman's period starts.

A woman is most fertile and most likely to get pregnant:

- Two to three days before your temperature hits the highest point (ovulation)
- 12 to 24 hours after ovulation

A man's sperm can live for up to three days in a woman's body. The sperm can fertilize an egg at any point during that time. So if you have unprotected sex a few days before ovulation, you could get pregnant.

Many things can affect basal body temperature. For your chart to be useful, make sure to take your temperature every morning at about the same time. Things that can alter your temperature include:

- Drinking alcohol the night before
- Smoking cigarettes the night before
- Getting a poor night's sleep
- Having a fever
- Doing anything in the morning before you take your temperature—including going to the bathroom and talking on the phone

2. **Calendar method**—This involves recording your menstrual cycle on a calendar for eight to 12 months. The first day of your period is Day 1. Circle Day 1 on the calendar. The length of your cycle may vary from month to month. So write down the total number of days it lasts each time. Using this record, you can find the days you are most fertile in the months ahead:

- To find out the first day when you are most fertile, subtract 18 from the total number of days in your shortest cycle. Take this new number and count ahead that many days from the first day of your next period. Draw an X through this date on your calendar. The X marks the first day you're likely to be fertile.
- To find out the last day when you are most fertile, subtract 11 from the total number of days in your longest cycle. Take this new number and count ahead that many days from the first day of your next period. Draw an X through this date on your calendar. The time between the two Xs is your most fertile window.

This method always should be used along with other fertility awareness methods, especially if your cycles are not always the same length.

? Optional Learning Activity

Use this Ovulation and due date calculator to find out when you (or a woman you know) are most likely to become pregnant and to estimate your due date should conception occur.

Did you know?

The cervical mucus method is less reliable for some women. Women who are breastfeeding, taking hormonal birth control (like the pill), using feminine hygiene products, have vaginitis or sexually transmitted infections (STIs), or have had surgery on the cervix should not rely on this method.

3. **Cervical mucus method** (also known as the ovulation method)—This involves being aware of the changes in your cervical mucus throughout the month. The hormones that control the menstrual cycle also change the kind and amount of mucus you have before and during ovulation. Right after your period, there are usually a few days when there is no mucus present or "dry days." As the egg starts to mature, mucus increases in the vagina, appears at the vaginal opening, and is white or yellow and cloudy and sticky. The greatest amount of mucus appears just before ovulation. During these "wet days" it becomes clear and slippery, like raw egg whites. Sometimes it can be stretched apart. This is when you are most fertile. About four days after the wet days begin the mucus changes again. There will be much less and it becomes sticky and cloudy. You might have a few more dry days before your period returns. Describe changes in your mucus on a calendar. Label the days, "Sticky," "Dry," or "Wet." You are most fertile at the first sign of wetness after your period or a day or two before wetness begins.To most accurately track your fertility, use a combination of all three methods. This is called the symptothermal method. You can also purchase over-the-counter ovulation kits or fertility monitors to help find the best time to conceive. These kits work by detecting surges in a specific hormone called luteinizing hormone, which triggers ovulation.

Infertility

Some women want children but either cannot conceive or keep miscarrying. This is called *infertility*. Lots of couples have infertility problems. About one-third of the time, it is a female problem. In another one-third of cases, it is the man with the fertility problem. For the remaining one-third, both partners have fertility challenges or no cause is found.

Causes of infertility

Some common reasons for infertility in women include:

Age—Women generally have some decrease in fertility starting in their early 30s. And while many women in their 30s and 40s have no problems getting pregnant, fertility especially declines after age 35. As a woman ages, normal changes that occur in her ovaries and eggs make it harder to become pregnant. Even though menstrual cycles continue to be regular in a woman's 30s and 40s, the eggs that ovulate each month are of poorer quality than those from her 20s. It is harder to get pregnant when the eggs are poorer in quality. As a woman nears menopause, the ovaries may not release an egg each month, which also can make it harder to get pregnant. Also, as a woman and her eggs age, she is more likely to miscarry, as well as have a baby with genetic problems, such as Down syndrome.

Health problems—Some women have diseases or conditions that affect their hormone levels, which can cause infertility. Women with polycystic ovary syndrome (PCOS) rarely or never ovulate. Failure to ovulate is the most common cause of infertility in women.

- With primary ovarian insufficiency (POI), a woman's ovaries stop working normally before she is 40. It is not the same as early menopause. Some women with POI get a period now and then. But getting pregnant is hard for women with POI.
- A condition called luteal phase defect (LPD) is a failure of the uterine lining to be fully prepared for pregnancy. This can keep a fertilized egg from implanting or result in miscarriage.

Common problems with a woman's reproductive organs, like uterine fibroids, endometriosis, and pelvic inflammatory disease can worsen with age and also affect fertility. These conditions might cause the fallopian tubes to be blocked, so the egg can't travel through the tubes into the uterus.

Lifestyle factors—Certain lifestyle factors also can have a negative effect on a woman's fertility. Examples include smoking, alcohol use, weighing much more or much less than an ideal body weight, a lot of strenuous exercise, and having an eating disorder. Stress also can affect fertility.

Unlike women, some men remain fertile into their 60s and 70s. But as men age, they might begin to have problems with the shape and movement of their sperm. They also have a slightly higher risk of sperm gene defects. Or they might produce no sperm, or too few sperm. Lifestyle choices also can affect the number and quality of a man's sperm. Alcohol and drugs can temporarily reduce sperm quality. And researchers are looking at whether environmental toxins, such as pesticides and lead, also may be to blame for some cases of infertility. Men also can have health problems that affect their sexual and reproductive function. These can include sexually transmitted infections (STIs), diabetes, surgery on the prostate gland, or a severe testicle injury or problem.

When to see your doctor

You should talk to your doctor about your fertility if:

- You are younger than 35 and have not been able to conceive after one year of frequent sex without birth control.
- You are age 35 or older and have not been able to conceive after six months of frequent sex without birth control.
- You believe you or your partner might have fertility problems in the future (even before you begin trying to get pregnant).
- You or your partner has a problem with sexual function or libido.

Happily, doctors are able to help many infertile couples go on to have babies.

If you are having fertility issues, your doctor can refer you to a fertility specialist, a doctor who treats infertility. The doctor will need to test both you and your partner to find out what the problem is. Depending on the problem, your doctor might recommend treatment. About 9 in 10 cases of infertility are treated with drugs or surgery. *Don't delay seeing your doctor as age also affects the success rates of these treatments.* For some couples, adoption or foster care offers a way to share their love with a child and to build a family.

Infertility treatment

Some treatments include:

- **Drugs**—Various fertility drugs may be used for women with ovulation problems. It is important to talk with your doctor about the drug to be used. You should understand the drug's benefits and side effects. Depending on the type of fertility drug and the dosage of the drug used, multiple births (such as twins) can occur.
- **Surgery**—Surgery is done to repair damage to a woman's ovaries, fallopian tubes, or uterus. Sometimes a man has an infertility problem that can be corrected by surgery.
- **Intrauterine insemination (IUI), also called artificial insemination**—Male sperm is injected into part of the woman's reproductive tract, such as into the uterus or fallopian tube. IUI often is used along with drugs that cause a woman to ovulate.
- **Assisted reproductive technology (ART)**—ART involves stimulating a woman's ovaries; removing eggs from her body; mixing them with sperm in the laboratory; and putting the embryos back into a woman's body. Success rates of ART vary and depend on many factors.
- **Third party assistance**—Options include donor eggs (eggs from another woman are used), donor sperm (sperm from another man are used), or surrogacy (when another woman carries a baby for you).

Finding the cause of infertility is often a long, complex, and emotional process. And treatment can be expensive. Many health insurance companies do not provide coverage for infertility or provide only limited coverage. Check your health insurance contract

carefully to learn about what is covered. Some states have laws that mandate health insurance policies to provide infertility coverage.

Birth Control Methods

Birth Control Methods: Reversible and Permanent

In the United States, **almost half of all pregnancies are unintended**. Yet, several safe and highly effective methods of contraception (birth control) are available to prevent unintended pregnancy. Since 2000, several new methods of birth control have become available in the United States, including

- the levonorgestrel-releasing intrauterine system,
- the hormonal contraceptive patch,
- the hormonal contraceptive ring,
- the hormonal implant, a 91-day regimen of oral contraceptives, two new barrier methods, and
- a new form of female sterilization.

Most women of reproductive age in the United States use birth control. Between 2006–2008, 99% of women who had ever had sexual intercourse had used at least one method of birth control; however, 7.3% of women who were currently at risk of unintended pregnancy were not using a contraceptive method. The **most popular method of birth control was the oral contraceptive pill**, used by 10.7 million women in the United States, followed by female sterilization, condoms, male sterilization, and other methods of birth control. Approximately **10% of women had ever used emergency contraception**.

Types of Birth Control

The effectiveness of birth control methods is critically important for reducing the risk of unintended pregnancy. Intrauterine contraception and the contraceptive implant remain effective for years once correctly in place. The effectiveness of hormonal, barrier, and fertility awareness-based methods depends on correct and consistent use. For each of these methods, a range of effectiveness estimates is provided; lower estimates are based on typical use and higher estimates are based on perfect use.

Reversible Methods of Birth Control

Intrauterine Contraception* Copper T intrauterine device (IUD) —An IUD is a small device that is shaped in the form of a “T.” Your doctor places it inside the uterus to prevent pregnancy. It can stay in your uterus for up to 10 years. This IUD is more than 99% effective at preventing pregnancy.

- **Levonorgestrel intrauterine system (IUS)**—The IUS is a small T-shaped device like the IUD. It is placed inside the uterus by a doctor. It releases a small amount of progestin each day to keep you from getting pregnant. The IUS stays in your uterus for up to 5 years. The IUS is more than 99% effective at preventing pregnancy.

Hormonal Methods

- **Implant**—The implant is a single, thin rod that is inserted under the skin of a women’s upper arm. The rod contains a progestin that is released into the body over 3 years. It is 99% effective at preventing pregnancy.
- **Injection or “shot”**—Women get shots of the hormone progestin in the buttocks or arm every three months from their doctor. It is 94–99% effective at preventing pregnancy.**Combined oral contraceptives**—Also called “the pill,”combined oral contraceptives contain the hormones estrogen and progestin. It is prescribed by a doctor. A pill is taken at the same time each day. If you are older than 35 years and smoke, have a history of blood clots or breast cancer, your doctor may advise you not to take the pill. The pill is 91–99% effective at preventing pregnancy.
- **Progestin only pill**—Unlike the combined pill, the progestin-only pill (sometimes called the mini-pill) only has one hormone, progestin, instead of both estrogen and progestin. It is prescribed by a doctor. It is taken at the same time each day. It is a good option for women who can’t take estrogen. They are 91–99% effective at preventing pregnancy.**Patch**—This skin patch is worn on the lower abdomen, buttocks, or upper body (but not on the breasts). This method is prescribed by a doctor. It releases hormones progestin and estrogen into the bloodstream. You put on a new patch once a week for three weeks. During the fourth week, you do not wear a patch, so you can have a menstrual period. The patch is 91–99% effective at preventing pregnancy, but it appears to be less effective in women who weigh more than 198 pounds.

- **Hormonal vaginal contraceptive ring**—The ring releases the hormones progestin and estrogen. You place the ring inside your vagina. You wear the ring for three weeks, take it out for the week you have your period, and then put in a new ring. It is 91–99% effective at preventing pregnancy.
- **Emergency contraception**—Emergency contraception is NOT a regular method of birth control. Emergency contraception can be used after no birth control was used during sex, or if the birth control method failed, such as if a condom broke.
  - Women can take emergency contraceptive pills up to 5 days after unprotected sex, but the sooner the pills are taken, the better they will work. There are three different types of emergency contraceptive pills available in the United States. Some emergency contraceptive pills are available over the counter for women 17 years of age or older. If younger than 17 years, emergency contraceptive pills are available by prescription.
  - Another type of emergency contraception is having your doctor insert the Copper T IUD into your uterus within seven days of unprotected sex. This method is 99% effective at preventing pregnancy.

Barrier Methods

- **Male condom**—Worn by the man, a male condom keeps sperm from getting into a woman's body. Latex condoms, the most common type, help prevent pregnancy and HIV and other STDs as do the newer synthetic condoms. "Natural" or "lambskin" condoms also help prevent pregnancy, but may not provide protection against STDs, including HIV. Male condoms are 82–98% effective at preventing pregnancy. Condoms can only be used once. You can buy condoms, KY jelly, or water-based lubricants at a drug store. Do not use oil-based lubricants such as massage oils, baby oil, lotions, or petroleum jelly with latex condoms. They will weaken the condom, causing it to tear or break.
- **Female condom**—Worn by the woman, the female condom helps keeps sperm from getting into her body. It is packaged with a lubricant and is available at drug stores. It can be inserted up to eight hours before sexual intercourse. Female condoms are 79–95% effective at preventing pregnancy, and also may help prevent STDs.
- **Diaphragm or cervical cap**—Each of these barrier methods are placed inside the vagina to cover the cervix to block sperm. The diaphragm is shaped like a shallow cup. The cervical cap is a thimble-shaped cup.Before sexual intercourse, you insert them with spermicide to block or kill sperm. The diaphragm is 84–94% effective at preventing pregnancy. Visit your doctor for a proper fitting because diaphragms and cervical caps come in different sizes
- **Spermicides**—These products work by killing sperm and come in several forms—foam, gel, cream, film, suppository, or tablet. They are placed in the vagina no more than one hour before intercourse. You leave them in place at least six to eight hours after intercourse. You can use a spermicide in addition to a male condom, diaphragm, or cervical cap. Spermicides alone are about 72–82% effective at preventing pregnancy. They can be purchased at drug stores.

Fertility Awareness-Based Methods

- **Natural family planning or fertility awareness**—Understanding your monthly fertility pattern can help you plan to get pregnant or avoid getting pregnant. Your fertility pattern is the number of days in the month when you are fertile (able to get pregnant), days when you are infertile, and days when fertility is unlikely, but possible. If you have a regular menstrual cycle, you have about nine or more fertile days each month. If you do not want to get pregnant, you do not have sex on the days you are fertile, or you use a barrier method of birth control on those days. These fertility awareness-based methods are 75–96% effective at preventing pregnancy.

Permanent Methods of Birth Control

Contraceptive sterilization is a permanent, safe, and highly effective approach for birth control. These methods are meant for people who are sure that they do not desire a pregnancy in the future.

The following methods are more than 99% effective at preventing pregnancy.

- **Female Sterilization**—**Tubal ligation or "tying tubes"**—A woman can have her fallopian tubes tied (or closed) so that sperm and eggs cannot meet for fertilization. The procedure can be done in a hospital or in an outpatient surgical center. You can go home the same day of the surgery and resume your normal activities within a few days. This method is effective immediately.
- **Transcervical Sterilization**— A thin tube is used to thread a tiny device into each fallopian tube. It irritates the fallopian tubes and causes scar tissue to grow and permanently plug the tubes. It can take about three months for the scar tissue to grow, so use another form of birth control during this time. Return to your doctor for a test to see if scar tissue has fully blocked your fallopian tubes.

- **Male Sterilization–Vasectomy**—This operation is done to keep a man's sperm from going to his penis, so his ejaculate never has any sperm in it that can fertilize an egg. The procedure is done at an outpatient surgical center. The man can go home the same day. Recovery time is less than one week. After the operation, a man visits his doctor for tests to count his sperm and to make sure the sperm count has dropped to zero; this takes about 12 weeks. Another form of birth control should be used until the man's sperm count has dropped to zero.

Although most women and men who undergo contraceptive sterilization do not regret having had the procedure, the permanence of the method is an important consideration, as regret has been documented in studies. For example, the U.S. Collaborative Review of Sterilization (CREST) study found that women who were younger at the time of the procedure were more likely to experience regret.

An additional issue addressed by the CREST study was the question of whether women who underwent contraceptive sterilization developed a "post-tubal ligation syndrome" of menstrual abnormalities, something that had been debated for years. Results indicated that menstrual abnormalities were no more common among women who had undergone tubal sterilization than among women who had not.

When considering a vasectomy, it's important to understand that failures can occur. CDC research has estimated there is a probability of 11 failures per 1,000 procedures over 2 years; half of the failures occurred in the first three months after the vasectomy, and no failures occurred after 72 weeks. CDC research also examined regret among women whose partner underwent a vasectomy. In interviews with female partners of men who received vasectomies, CDC found that while most women did not regret their husband's vasectomies, the probability of regret over 5 years was about 6%. This is why it is important to know facts about this and other permanent forms of birth control before making a decision.

Sources

Reproductive Health: Reproductive Health, Medline Plus, NLM, NIH, http://www.nlm.nih.gov/medlineplus/reproductivehealth.html

Menstruation and the menstrual cycle fact sheet: Menstruation, Office of Women's Health, NIH, womenshealth.gov/publications/our-publications/fact-sheet/menstruation.cfm

The Menstrual Cycle: The Menstrual Cycle, Office of Women's Health, NIH, womenshealth.gov/pregnancy/before-you-get-pregnant/menstrual-cycle.cfm

Preconception Care: Preconception Care, Office of Women's Health, NIH, USDHHS, womenshealth.gov/pregnancy/before-you-get-pregnant/preconception-health.cfm

Knowing if you are pregnant: Knowing If You Are Pregnant, Office of Women's Health, NIH, USDHHS, womenshealth.gov/pregnancy/before-you-get-pregnant/knowing-if-pregnant.cfm

Unplanned Pregnancy: Unplanned Pregnancy, Office of Woman's Health, NIH, www.womenshealth.gov/pregnancy/before-you-get-pregnant/unplanned-pregnancy.cfm

Trying to Get Pregnant: Trying to Get Pregnant, Office of Women's Health, NIH, USDHHS, womenshealth.gov/pregnancy/before-you-get-pregnant/trying-to-conceive.cfm

Birth Control Methods: Reversible and Permanent: CDC, www.cdc.gov/reproductivehealth/UnintendedPregnancy/Contraception.htm

? Exercise 4.4.1

1. Name one common reproductive health issue.
2. How can regular health screenings support reproductive health?
3. What lifestyle habit can improve reproductive health?

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CHAPTER OVERVIEW

5: Physical Activity

Learning Objectives

- Describe the health benefits of physical activity
- Explain the differences between aerobic and muscle-strengthening physical activity

5.1: The Relationship between Physical Activity and Health
5.2: Aerobic, Muscle-Strengthening, and Bone-Strengthening Activity
5.3: Health Benefits of Physical Activity
5.4: Dealing with Inactivity
5.5: Safe and Activity
5.6: Pregnancy and Disabilities
5.7: Community Efforts to Increase Physical Activity

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5.1: The Relationship between Physical Activity and Health

Learning Activity

Find out how much you already know about physical activity by completing this ungraded quiz. Do you know more or less than you thought?

All Americans should be regularly physically active to improve overall health and fitness and to prevent many adverse health outcomes. The benefits of physical activity occur in generally healthy people, in people at risk of developing chronic diseases, and in people with current chronic conditions or disabilities. The Physical Activity Guidelines for Americans (2008) gives guidance on the amount of physical activity that will provide health benefits for all Americans. In addition to presenting the Guidelines, this Chapter gives an overview of research findings on physical activity and health.

Physical activity affects many health conditions, and the specific amounts and types of activity that benefit each condition vary. One consistent finding from research studies is that once the health benefits from physical activity begin to accrue, additional amounts of activity provide additional benefits.

Although some health benefits seem to begin with as little as 60 minutes (1 hour) a week, research shows that a total amount of 150 minutes (2 hours and 30 minutes) a week of moderate-intensity aerobic activity, such as brisk walking, consistently reduces the risk of many chronic diseases and other adverse health outcomes.

Learning Activity

Watch the first three videos in this playlist about The Physical Activity Guidelines for Americans:

https://youtu.be/lEutFrar1dI?list=PL43D95102E29BC901

Examining the Relationship between Physical Activity and Health

In many studies covering a wide range of issues, researchers have focused on **exercise**, as well as on the more broadly defined concept of **physical activity**. Exercise is a form of physical activity that is planned, structured, repetitive, and performed with the goal of improving health or fitness. So, although all exercise is physical activity, not all physical activity is exercise.

Quick Review: What is the difference between physical activity and exercise?

Studies have examined the role of physical activity in many groups—men and women, children, teens, adults, older adults, people with disabilities, and women during pregnancy and the postpartum period. These studies have focused on the role that physical activity plays in many health outcomes, including:

- Premature (early) death;
- Diseases such as coronary heart disease, stroke, some cancers, type 2 diabetes, osteoporosis, and depression;
- Risk factors for disease, such as high blood pressure and high blood cholesterol;
- Physical fitness, such as **aerobic capacity**, and muscle **strength** and endurance
- Functional capacity (the ability to engage in activities needed for daily living);
- Mental health, such as depression and cognitive function; and
- Injuries or sudden heart attacks.

These studies have also prompted questions as to what type and how much physical activity is needed for various health benefits. To answer this question, investigators have studied three main kinds of physical activity: aerobic, muscle-strengthening, and bone-strengthening.

Sources

Examining the Relationship between Physical Activity and Health: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services.http://www.health.gov/paguidelines/guidelines/

Exercise 5.1.1

1. Name one physical and one mental health benefit of regular exercise.
2. How does physical activity help control body weight?
3. Define aerobic exercise.

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5.2: Aerobic, Muscle-Strengthening, and Bone-Strengthening Activity

Aerobic, Muscle-strengthening, and Bone-strengthening Activity

Aerobic activities, also called endurance activities, are physical activities in which people move their large muscles in a rhythmic manner for a sustained period. Running, brisk walking, bicycling, playing basketball, dancing, and swimming are all examples of aerobic activities. Aerobic activity makes a person's heart beat more rapidly to meet the demands of the body's movement. Over time, regular aerobic activity makes the heart and cardiovascular system stronger and fitter.

Aerobic physical activity has these components:

- Frequency
- Intensity, or how hard a person works to do the activity. The intensities most often examined are moderate intensity (equivalent in effort to brisk walking) and vigorous intensity (equivalent in effort to running or jogging);
- Duration, or how long a person does an activity in any one session.

Although these components make up a physical activity profile, research has shown that the total amount of physical activity (minutes of moderate-intensity physical activity, for example) is more important for achieving health benefits than is any one component (frequency, intensity, or duration).

Quick Review

Which is the more important for achieving health benefits from aerobic activity:

1. total minutes
2. how vigorous the activity is

Key Guidelines for Adults

All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.

For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.

For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate-intensity, or 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.

Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

How Much Total Activity a Week?

When adults do the equivalent of 150 minutes of moderate-intensity aerobic activity each week, the benefits are *substantial*. These benefits include lower risk of premature death, coronary heart disease, stroke, hypertension, type 2 diabetes, and depression.

Not all health benefits of physical activity occur at 150 minutes a week. As a person moves from 150 minutes a week toward 300 minutes (5 hours) a week, he or she gains additional health benefits. Additional benefits include lower risk of colon and breast cancer and prevention of unhealthy weight gain.

Also, as a person moves from 150 minutes a week toward 300 minutes a week, the benefits that occur at 150 minutes a week become *more extensive*. For example, a person who does 300 minutes a week has an even lower risk of heart disease or diabetes than a person who does 150 minutes a week.

The benefits continue to increase when a person does more than the equivalent of 300 minutes a week of moderate-intensity aerobic activity. For example, a person who does 420 minutes (7 hours) a week has an even lower risk of premature death than a person who does 150 to 300 minutes a week. Current science does not allow identifying an upper limit of total activity above which there are no additional health benefits.

How Many Days a Week and for How Long?

Aerobic physical activity should preferably be spread throughout the week. Research studies consistently show that activity performed on at least 3 days a week produces health benefits. Spreading physical activity across at least 3 days a week may help to reduce the risk of injury and avoid excessive fatigue.

Both moderate- and vigorous-intensity aerobic activity should be performed in episodes of at least 10 minutes. Episodes of this duration are known to improve cardiovascular fitness and some risk factors for heart disease and type 2 diabetes.

How Intense?

The *Guidelines* for adults focus on two levels of intensity: moderate-intensity activity and vigorous–intensity activity. To meet the Guidelines, adults can do either moderate-intensity or vigorous-intensity aerobic activities, or a combination of both. It takes less time to get the same benefit from vigorous-intensity activities as from moderate-intensity activities. A general rule of thumb is that 2 minutes of moderate-intensity activity counts the same as 1 minute of vigorous-intensity activity. For example, 30 minutes of moderate-intensity activity a week is roughly the same as 15 minutes of vigorous-intensity activity.

A person doing moderate-intensity aerobic activity can talk, but not sing, during the activity. A person doing vigorous intensity activity cannot say more than a few words without pausing for a breath.

Examples of Different Aerobic Physical Activities and Intensities

Moderate Intensity

- Walking briskly (3 miles per hour or faster, but not race-walking)
- Water aerobics
- Bicycling slower than 10 miles per hour
- Tennis (doubles)
- Ballroom dancing
- General gardening

Vigorous Intensity

- Racewalking, jogging, or running
- Swimming laps
- Tennis (singles)
- Aerobic dancing
- Bicycling 10 miles per hour or faster
- Jumping rope
- Heavy gardening (continuous digging or hoeing, with heart rate increases)
- Hiking uphill or with a heavy backpack

Muscle-Strengthening Activity

This kind of activity, which includes **resistance training** and lifting weights, causes the body's muscles to work or hold against an applied force or weight. These activities often involve relatively heavy objects, such as weights, which are lifted multiple times to train various muscle groups. Muscle-strengthening activity can also be done by using elastic bands or body weight for resistance (climbing a tree or doing push-ups, for example).
Muscle-strengthening activity also has three components:

- **Intensity**, or how much weight or force is used relative to how much a person is able to lift;
- **Frequency**, or how often a person does muscle strengthening activity; and

- **Repetitions**, or how many times a person lifts a weight (analogous to duration for aerobic activity). The effects of muscle-strengthening activity are limited to the muscles doing the work. It's important to work all the major muscle groups of the body: the legs, hips, back, abdomen, chest, shoulders, and arms.

Muscle-strengthening activities provide additional benefits not found with aerobic activity. The benefits of muscle-strengthening activity include increased bone strength and muscular fitness. Muscle-strengthening activities can also help maintain muscle mass during a program of weight loss.

Muscle-strengthening activities make muscles do more work than they are accustomed to doing. That is, they overload the muscles. Resistance training, including weight training, is a familiar example of muscle-strengthening activity. Other examples include working with resistance bands, doing calisthenics that use body weight for resistance (such as push-ups, pull-ups, and sit-ups), carrying heavy loads, and heavy gardening (such as digging or hoeing).

Muscle-strengthening activities count if they involve a moderate to high level of intensity or effort and work the major muscle groups of the body: the legs, hips, back, chest, abdomen, shoulders, and arms. Muscle strengthening activities for all the major muscle groups should be done at least 2 days a week.

No specific amount of time is recommended for muscle strengthening, but muscle-strengthening exercises should be performed to the point at which it would be difficult to do another repetition without help. When resistance training is used to enhance muscle strength, one set of 8 to 12 repetitions of each exercise is effective, although two or three sets may be more effective. Development of muscle strength and endurance is progressive over time. Increases in the amount of weight or the days a week of exercising will result in stronger muscles.

? Learning Activity

Watch some of the following videos to view muscle strengthening exercises:

- Introduction
- Toe lift
- Half-squat
- Superman
- Sit-ups
- Push-ups
- Bicep curls

Bone-Strengthening Activity

This kind of activity (sometimes called weight-bearing or weight-loading activity) produces a force on the bones that promotes bone growth and strength. This force is commonly produced by impact with the ground. Examples of bone-strengthening activity include jumping jacks, running, brisk walking, and weight-lifting exercises. As these examples illustrate, bone-strengthening activities can also be aerobic and muscle strengthening.

Quick Review

What physical activity is both muscle-strengthening and bone-strengthening?

Sources

Aerobic, Muscle-strengthening and Bone-strengthening Activity: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services,http://www.health.gov/paguidelines/guidelines/

Muscle-Strengthening Activity: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services.http://www.health.gov/paguidelines/guidelines/

Bone-Strengthening Activity: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services. http://www.health.gov/paguidelines/guidelines/

Exercise 5.2.1

1. Name two physical benefits of regular exercise.
2. How does exercise improve mental health?
3. Why is physical activity important for cardiovascular health?

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5.3: Health Benefits of Physical Activity

Studies clearly demonstrate that participating in regular physical activity provides many health benefits. Many conditions affected by physical activity occur with increasing age, such as heart disease and cancer. Reducing risk of these conditions may require years of participation in regular physical activity. However, other benefits, such as increased **cardiorespiratory fitness**, increased muscular strength, and decreased depressive symptoms and blood pressure, require only a few weeks or months of participation in physical activity.

? Learning Activity

Watch this video: What is the single best thing we can do for our health?



Health Benefits of Physical Activity—Major Research Findings

- Regular physical activity reduces the risk of many adverse health outcomes.
- Some physical activity is better than none.
- For most health outcomes, additional benefits occur as the amount of physical activity increases through higher intensity, greater frequency, and/or longer duration.
- Most health benefits occur with at least 150 minutes a week of moderate-intensity physical activity, such as brisk walking. Additional benefits occur with more physical activity.
- Both aerobic (endurance) and muscle-strengthening (resistance) physical activity are beneficial.
- Health benefits occur for children and adolescents, young and middle-aged adults, older adults, and those in every studied racial and ethnic group.
- The benefits of physical activity far outweigh the possibility of adverse outcomes.

Quick Review: How many minutes per week does it take to get the health benefits of physical activity?

The Beneficial Effects of Increasing Physical Activity: It's About Overload, Progression, and Specificity

Overload is the physical stress placed on the body when physical activity is greater in amount or intensity than usual. The body's structures and functions respond and adapt to these stresses. For example, aerobic physical activity places a stress on the cardiorespiratory system and muscles, requiring the lungs to move more air and the heart to pump more blood and deliver it to the working muscles. This increase in demand increases the efficiency and capacity of the lungs, heart, circulatory system, and exercising muscles. In the same way, muscle–strengthening and bone-strengthening activities overload muscles and bones, making them stronger.

Progression is closely tied to overload. Once a person reaches a certain fitness level, he or she progresses to higher levels of physical activity by continued overload and adaptation. Small, progressive changes in overload help the body adapt to the additional stresses while minimizing the risk of injury.

Specificity means that the benefits of physical activity are specific to the body systems that are doing the work. For example, aerobic physical activity largely benefits the body's cardiovascular system.

The health benefits of physical activity are seen in children and adolescents, young and middle-aged adults, older adults, women and men, people of different races and ethnicities, and people with disabilities and chronic conditions. The health benefits of physical activity are generally independent of body weight. Adults of all sizes and shapes gain health and fitness benefits by being habitually physically active. The benefits of physical activity also outweigh the risk of injury and sudden heart attacks, two concerns that prevent many people from becoming physically active.

Quick Review

Who benefits most from being habitually physically active: overweight men, obese women, average weight men and women?

The following sections provide more detail on what is known from research studies about the specific health benefits of physical activity and how much physical activity is needed to get the health benefits.

Premature Death

Strong scientific evidence shows that physical activity reduces the risk of premature death (dying earlier than the average age of death for a specific population group) from the leading causes of death, such as heart disease and some cancers, as well as from other causes of death. This effect is remarkable in two ways:

First, only a few lifestyle choices have as large an effect on mortality as physical activity. It has been estimated that people who are physically active for approximately 7 hours a week have a 40 percent lower risk of dying early than those who are active for less than 30 minutes a week.

Second, it is not necessary to do high amounts of activity or vigorous-intensity activity to reduce the risk of premature death. Studies show substantially lower risk when people do 150 minutes of at least moderate-intensity aerobic physical activity a week.

Research clearly demonstrates the importance of avoiding inactivity. Even low amounts of physical activity reduce the risk of dying prematurely. The most dramatic difference in risk is seen between those who are inactive (30 minutes a week) and those with low levels of activity (90 minutes or 1 hour and 30 minutes a week).

All adults can gain this health benefit of physical activity. Age, race, and ethnicity do not matter. Men and women younger than 65 years as well as older adults have lower rates of early death when they are physically active than when they are inactive. Physically active people of all body weights (normal weight, overweight, obese) also have lower rates of early death than do inactive people.

Cardiorespiratory Health

The benefits of physical activity on cardiorespiratory health are some of the most extensively documented of all the health benefits. Cardiorespiratory health involves the health of the heart, lungs, and blood vessels.

Heart diseases and stroke are two of the leading causes of death in the United States. Risk factors that increase the likelihood of cardiovascular diseases include smoking, high blood pressure (called hypertension), type 2 diabetes, and high levels of certain blood lipids (such as low-density lipoprotein, or LDL, cholesterol). Low cardiorespiratory fitness also is a risk factor for heart disease.

People who do moderate- or vigorous-intensity aerobic physical activity have a significantly lower risk of cardiovascular disease than do inactive people. Regularly active adults have lower rates of heart disease and stroke, and have lower blood pressure, better blood lipid profiles, and fitness. Significant reductions in risk of cardiovascular disease occur at activity levels equivalent to 150 minutes a week of moderate-intensity physical activity. Even greater benefits are seen with 200 minutes (3 hours and 20 minutes) a week. The evidence is strong that greater amounts of physical activity result in even further reductions in the risk of cardiovascular disease.

Moderate-intensity physical activity is safe for generally healthy women during pregnancy. It increases cardiorespiratory fitness without increasing the risk of early pregnancy loss, preterm delivery, or low birth weight. Physical activity during the postpartum period also improves cardiorespiratory fitness.

Metabolic Health

Regular physical activity strongly reduces the risk of developing type 2 diabetes as well as the metabolic syndrome. The metabolic syndrome is defined as a condition in which people have some combination of high blood pressure, a large waistline (abdominal obesity), an adverse blood lipid profile (low levels of high-density lipoprotein [HDL] cholesterol, raised triglycerides), and impaired glucose tolerance.

People who regularly engage in at least moderate intensity aerobic activity have a significantly lower risk of developing type 2 diabetes than do inactive people. Although some experts debate the usefulness of defining the metabolic syndrome, good evidence exists that physical activity reduces the risk of having this condition, as defined in various ways. Lower rates of these conditions are seen with 120 to 150 minutes (2 hours to 2 hours and 30 minutes) a week of at least moderate-intensity aerobic activity. As with cardiovascular health, additional levels of physical activity seem to lower risk even further. In addition, physical activity helps control blood glucose levels in persons who already have type 2 diabetes.

Physical activity also improves metabolic health in youth. Studies find this effect when young people participate in at least 3 days of vigorous aerobic activity a week. More physical activity is associated with improved metabolic health, but research has yet to determine the exact amount of improvement.

Physical Activity in a Weight-Control Plan: Obesity and Energy Balance

Along with appropriate dietary intake, physical activity is an important part of maintaining healthy weight, losing weight, and keeping extra weight off once it has been lost. Physical activity also helps reduce abdominal fat and preserve muscle during weight loss. Adults should aim for a healthy, stable body weight. The amount of physical activity necessary to achieve this weight varies greatly from person to person.

The first step in achieving or maintaining a healthy weight is to meet the minimum level of physical activity in the Guidelines. For some people this will result in a stable and healthy body weight, but for many it may not.
The health benefits of physical activity are generally independent of body weight. The good news for people needing to lose weight is that regular physical activity provides major health benefits, no matter how their weight changes over time.

People who are at a healthy body weight but slowly gaining weight can either gradually increase the level of physical activity (toward the equivalent of 300 minutes a week of moderate-intensity aerobic activity), or reduce caloric intake, or both, until their weight is stable. By regularly checking body weight, people can find the amount of physical activity that works for them.

Many adults will need to do more than the 150 minutes a week of moderate-intensity aerobic physical activity as part of a program to lose weight or keep it off. These adults should do more physical activity and/or further reduce their caloric intake. Some people will need to do the equivalent of 300 or more minutes of moderate-intensity physical activity a week to meet their weight-control goals. Combined with restricting caloric intake, these adults should gradually increase minutes or the intensity of aerobic physical activity per week, to the point at which the physical activity is effective in achieving a healthy weight.

It is important to remember that all activities—both baseline and physical activity—“count” for energy balance. Active choices, such as taking the stairs rather than the elevator or adding short episodes of walking to the day, are examples of activities that can be helpful in weight control.

For weight control, vigorous-intensity activity is far more time-efficient than moderate-intensity activity. For example, an adult who weighs 165 pounds (75 kg) will burn 560 calories from 150 minutes of brisk walking at 4 miles an hour (these calories are in addition to the calories normally burned by a body at rest). That person can burn the same number of additional calories in 50 minutes by running 5 miles at a 10 minutes-per-mile pace.

Quick Review

If you wanted to use physical activity for weight loss and control, which approach would make most the sense for you personally: increased intensity or increased minutes per week? Why?

Over short periods of time, such as a year, research shows that it is possible to achieve weight stability by doing the equivalent of 150 to 300 minutes (5 hours) a week of moderate-intensity walking at about a 4 mile-an-hour pace. Muscle-strengthening activities may help promote weight maintenance, although not to the same degree as aerobic activity.

People who want to lose a substantial (more than 5 percent of body weight) amount of weight and people who are trying to keep a significant amount of weight off once it has been lost need a high amount of physical activity unless they also reduce their caloric intake. Many people need to do more than 300 minutes of moderate-intensity activity a week to meet weight–control goals.

Musculoskeletal Health

Bones, muscles, and joints support the body and help it move. Healthy bones, joints, and muscles are critical to the ability to do daily activities without physical limitations.

Preserving bone, joint, and muscle health is essential with increasing age. Studies show that the frequent decline in bone density that happens during aging can be slowed with regular physical activity. These effects are seen in people who participate in **aerobic, muscle–strengthening, and bone-strengthening physical activity** programs of moderate or vigorous intensity. The range of total physical activity for these benefits varies widely. Important changes seem to begin at 90 minutes a week and continue up to 300 minutes a week.

Hip fracture is a serious health condition that can have life-changing negative effects for many older people. Physically active people, especially women, appear to have a lower risk of hip fracture than do inactive people. Research studies on physical activity to prevent hip fracture show that participating in 120 to 300 minutes a week of physical activity that is of at least moderate intensity is associated with a reduced risk. It is unclear, however, whether activity also lowers risk of fractures of the spine or other important areas of the skeleton.

Building strong, healthy bones is also important for children and adolescents. Along with having a healthy diet that includes adequate calcium and vitamin D, physical activity is critical for bone development in children and adolescents. **Bone-strengthening physical activity** done 3 or more days a week increases bone-mineral content and bone density in youth.

Regular physical activity also helps people with arthritis or other rheumatic conditions affecting the joints. Participation in 130 to 150 minutes (2 hours and 10 minutes to 2 hours and 30 minutes) a week of moderate-intensity, low-impact physical activity improves pain management, function, and quality of life. Researchers don’t yet know whether participation in physical activity, particularly at low to moderate intensity, reduces the risk of osteoarthritis. Very high levels of physical activity, however, may have extra risks. People who participate in very high levels of physical activity, such as elite or professional athletes, have a higher risk of hip and knee osteoarthritis, mostly due to the risk of injury involved in competing in some sports.

Progressive muscle-strengthening activities increase or preserve muscle mass, strength, and power. Higher amounts (through greater frequency or higher weights) improve muscle function to a greater degree. Improvements occur in younger and older adults. Resistance exercises also improve muscular strength in persons with such conditions as stroke, multiple sclerosis, cerebral palsy, spinal cord injury, and cognitive disability. Though it doesn’t increase muscle mass in the same way that muscle-strengthening activities do, aerobic activity may also help slow the loss of muscle with aging.

Functional Ability and Fall Prevention

Functional ability is the capacity of a person to perform tasks or behaviors that enable him or her to carry out everyday activities, such as climbing stairs or walking on a sidewalk. Functional ability is key to a person’s ability to fulfill basic life roles, such as personal care, grocery shopping, or playing with the grandchildren. Loss of functional ability is referred to as functional limitation.

Middle-aged and older adults who are physically active have lower risk of functional limitations than do inactive adults. It appears that greater physical activity levels can further reduce risk of functional limitations.
Older adults who already have functional limitations also benefit from regular physical activity. Typically, studies of physical activity in adults with functional limitations tested a combination of aerobic and muscle strengthening activities, making it difficult to assess the relative importance of each type of activity. However, both types of activity appear to provide benefit.

In older adults at risk of falls, strong evidence shows that regular physical activity is safe and reduces this risk. Reduction in falls is seen for participants in programs that include balance and moderate-intensity muscle-strengthening activities for 90 minutes a week plus moderate-intensity walking for about an hour a week. It’s not known whether different combinations of type, amount, or frequency of activity can reduce falls to a greater degree. Tai chi exercises also may help prevent falls.

Mental Health

Physically active adults have lower risk of depression and cognitive decline (declines with aging in thinking, learning, and judgment skills). Physical activity also may improve the quality of sleep. Whether physical activity reduces distress or anxiety is currently unclear.

Mental health benefits have been found in people who do aerobic or a combination of aerobic and muscle-strengthening activities 3 to 5 days a week for 30 to 60 minutes at a time. Some research has shown that even lower levels of physical activity also may provide some benefits.

Regular physical activity appears to reduce symptoms of anxiety and depression for children and adolescents. Whether physical activity improves self-esteem is not clear.

Adverse Events

Some people hesitate to become active or increase their level of physical activity because they fear getting injured or having a heart attack. Studies of generally healthy people clearly show that moderate-intensity physical activity, such as brisk walking, has a low risk of such adverse events.

The risk of musculoskeletal injury increases with the total amount of physical activity. For example, a person who regularly runs 40 miles a week has a higher risk of injury than a person who runs 10 miles each week. However, people who are physically active may have fewer injuries from other causes, such as motor vehicle collisions or work-related injuries. Depending on the type and amount of activity that physically active people do, their overall injury rate may be lower than the overall injury rate for inactive people.

Participation in contact or collision sports, such as soccer or football, has a higher risk of injury than participation in non-contact physical activity, such as swimming or walking. However, when performing the same activity, people who are less fit are more likely to be injured than people who are fitter.

Cardiac events, such as a heart attack or sudden death during physical activity, are rare. However, the risk of such cardiac events does increase when a person suddenly becomes much more active than usual. The greatest risk occurs when an adult who is usually inactive engages in vigorous-intensity activity (such as shoveling snow). People who are regularly physically active have the lowest risk of cardiac events both while being active and overall.

The bottom line is that the health benefits of physical activity far outweigh the risks of adverse events for almost everyone.

Sources

Source: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services.http://www.health.gov/paguidelines/guidelines/

? Exercise 5.3.1

1. What distinguishes aerobic exercise from anaerobic exercise?
2. Give two examples of aerobic activities.
3. How does aerobic exercise benefit the heart and lungs?

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5.4: Dealing with Inactivity

Inactive adults or those who don't yet do 150 minutes of physical activity a week should work gradually toward this goal. The initial amount of activity should be at a light or moderate intensity, for short periods of time, with the sessions spread throughout the week. The good news is that "some is better than none."

People gain some health benefits even when they do as little as 60 minutes a week of moderate-intensity aerobic physical activity.

To reduce risk of injury, it is important to increase the amount of physical activity gradually over a period of weeks to months. For example, an inactive person could start with a walking program consisting of 5 minutes of slow walking several times each day, 5 to 6 days a week. The length of time could then gradually be increased to 10 minutes per session, 3 times a day, and the walking speed could be increased slowly.

Muscle-strengthening activities should also be gradually increased over time. Initially, these activities can be done just 1 day a week starting at a light or moderate level of effort. Over time, the number of days a week can be increased to 2, and then possibly to more than 2. Each week, the level of effort (intensity) can be increased slightly until it becomes moderate to high.

Flexibility Activities

Flexibility is an important part of physical fitness. Some types of physical activity, such as dancing, require more flexibility than others. Stretching exercises are effective in increasing flexibility, and thereby can allow people to more easily do activities that require greater flexibility. For this reason, flexibility activities are an appropriate part of a physical activity program, even though they have no known health benefits and it is unclear whether they reduce risk of injury. Time spent doing flexibility activities by themselves does not count toward meeting the aerobic or muscle-strengthening guidelines (Physical Activity Guidelines for Americans).

Warm-up and Cool-down

Warm-up and cool-down activities are an acceptable part of a person's physical activity plan. Commonly, the warm-up and cool-down involve doing an activity at a slower speed or lower intensity. A warm-up before moderate- or vigorous-intensity aerobic activity allows a gradual increase in heart rate and breathing at the start of the episode of activity. A cool-down after activity allows a gradual decrease at the end of the episode. Time spent doing warm-up and cool-down may count toward meeting the aerobic activity Guidelines if the activity is at least moderate intensity (for example, walking briskly as a warm-up before jogging). A warm-up for muscle-strengthening activity commonly involves doing exercises with lighter weight.

✔ Getting and Staying Active: Real-Life Examples

Adults can meet the *Physical Activity Guidelines* in all sorts of ways and with many types of physical activity. The choices of types and amounts of physical activity depend on personal health and fitness goals.

Here are three examples.

Jean: An Inactive Middle-Aged Woman

- **Her goals**: Jean sets a goal of doing 1 hour a day of moderate-intensity aerobic activity on 5 days a week (a total of 300 minutes a week). Weighing 220 pounds, Jean is obese and wants to lose about 1 pound of weight each week.
- **Starting out**: Jean cuts back on her caloric intake and starts walking 5 minutes in the morning and 5 minutes in the evening most days of the week. She walks at a 2.5 mile-an-hour pace. Although physical activity tables show this to be light-intensity activity, for her level of fitness and fatness, it is appropriate moderate–intensity activity.
- **Making good progress**: Two months later, Jean is comfortably walking 30 to 40 minutes at moderate intensity to and from her bus stop every day. She then adds variety to her activity by alternating among walking, riding a stationary cycle, and low-impact aerobics. She also begins muscle-strengthening activities, using elastic bands twice each week.
- **Reaching her goal:** Eventually, Jean works up to 300 minutes a week of moderate-intensity aerobic activity, including her brisk walks to and from the bus stop. She has lost 40 pounds of weight in 1 year, with most of the weight loss occurring the previous 6 months when she mastered her diet and was able to do greater amounts of physical activity.

Douglas: An Active Middle-Aged Man

- **His goal and current activity pattern:** Douglas was a soccer player in his youth. His goal is to get back into shape by becoming a regular recreational runner. In addition to his job operating heavy equipment, he walks 30 to 40 minutes a day on 5 days each week. He also lifts weights 2 days a week.
- **Starting out:** Douglas starts a walk/jog program with a co-worker and plans to gradually replace walking with jogging and then running. The first week he goes out on 5 days, walking for 25 minutes and jogging for 5 minutes.
- **Making good progress:** Each week, Douglas gradually increases the time spent jogging (vigorous-intensity activity) and reduces the time spent walking (moderate–intensity activity). He also continues his weight-lifting program.
- **Reaching his goal:** Eventually, Douglas is running 30 to 45 minutes 4 days a week and lifting weights 2 days a week. He goes for a 1-hour bicycle ride on most weekends.

Anita

- **Her goals and current activity pattern:** Anita plays league basketball (vigorous-intensity activity) 4 days each week for 90 minutes each day. She wants to reduce her risk of injury from doing too much of one kind of activity (this is called an overuse injury).
- **Starting out:** Anita starts out by cutting back her basketball playing to 3 days each week. She begins to bicycle to and from campus (30 minutes each way) instead of driving her car. She also joins a yoga class that meets twice each week.
- **Reaching her goal:** Eventually, Anita is bicycling 3 days each week to and from campus in addition to playing basketball. Her yoga class helps her to build and maintain strength and flexibility.

Achieving Target Levels of Physical Activity: Possibilities Are Endless

These examples show how it's possible to meet the Guidelines by doing moderate-intensity or vigorous-intensity activity or a combination of both. Physical activity at this level provides substantial health benefits.

- Ways to get the equivalent of 150 minutes (2 hours and 30 minutes) of moderate-intensity aerobic physical activity a week plus muscle-strengthening activities:
- Thirty minutes of brisk walking (moderate intensity) on 5 days, exercising with resistance bands (muscle strengthening) on 2 days;
- Thirty minutes of brisk walking on 2 days, 60 minutes (1 hour) of social dancing (moderate intensity) on 1 evening, 30 minutes of mowing the lawn (moderate intensity) on 1 afternoon, heavy gardening (muscle strengthening) on 2 days;
- Thirty minutes of an aerobic dance class on 1 morning (vigorous intensity), 30 minutes of running on 1 day (vigorous intensity), 30 minutes of brisk walking on 1 day (moderate intensity), calisthenics (such as sit-ups, push-ups) on 3 days (muscle strengthening);
- Thirty minutes of biking to and from work on 3 days (moderate intensity), playing softball for 60 minutes on 1 day (moderate intensity), using weight machines on 2 days (muscle-strengthening on 2 days); and
- Forty-five minutes of doubles tennis on 2 days (moderate intensity), lifting weights after work on 1 day (muscle strengthening), hiking vigorously for 30 minutes and rock climbing (muscle strengthening) on 1 day.

? Learning Activity

Find out what kind of physical activity suits you the best at the BAM website.

Personalize the Benefits of Regular Physical Activity

Adults need to identify benefits of personal value to them. For many people, the health benefits, which are the focus of the *Physical Activity Guidelines for Americans*, are compelling enough. For others, different reasons are key motivators to be active. For example, physical activity:

- Provides opportunities to enjoy recreational activities, often in a social setting;
- Improves personal appearance;
- Provides a chance to help a spouse lose weight;
- Improves the quality of sleep;
- Reduces feelings of low energy; and

- Gives older adults a greater opportunity to live independently in the community.

Set Personal Goals for Physical Activity

The Guidelines alone don't provide enough information for individuals to decide the types and amounts of activity that are appropriate for them. Individuals should set goals for activity that allow them to achieve benefits they value. Simple goals are fine. For example, a brisk walk in the neighborhood with friends for 45 minutes 3 days a week and walking to lunch twice a week may be just the right approach for someone who wants to increase both physical activity and social opportunities.

In setting goals, people can consider doing a variety of activities and try both indoor and outdoor activities. In particular, public parks and recreation areas in the United States offer opportunities to experience nature and be physically active at the same time.

The best physical activity is the one that is enjoyable enough to do regularly.

? Learning Activity

Try this interactive online tool if you want help scheduling your own physical activity calendar. More tips about scheduling your physical activity are available at Adult Guidelines.

Sources

Source: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services.http://www.health.gov/paguidelines/guidelines/

? Exercise 5.4.1

1. What is the difference between muscular strength and muscular endurance?
2. Why is it important to improve muscle strength?
3. Give an example of an exercise that builds muscular endurance.

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5.5: Safe and Activity

Be Safe and Active

Although physical activity has many health benefits, injuries and other adverse events do sometimes happen. The most common injuries affect the musculoskeletal system (the bones, joints, muscles, ligaments, and tendons). Other adverse events can also occur during activity, such as overheating and dehydration. On rare occasions, people have heart attacks during activity.

The good news is that scientific evidence strongly shows that physical activity is safe for almost everyone. Moreover, the health benefits of physical activity far outweigh the risks.

Still, people may hesitate to become physically active because of concern they'll get hurt. For these people, there is even more good news: They can take steps that are proven to reduce their risk of injury and adverse events.

The guidelines in this module provide advice to help people do physical activity safely. Most advice applies to people of all ages. Specific guidance for particular age groups and people with certain conditions is also provided.

Physical Activity is Safe for Almost Everyone

Most people are not likely to be injured when doing moderate-intensity activities in amounts that meet the *Physical Activity Guidelines*. However, injuries and other adverse events do sometimes happen. The most common problems are musculoskeletal injuries. Even so, studies show that only one such injury occurs for every 1,000 hours of walking for exercise, and fewer than four injuries occur for every 1,000 hours of running.

Both physical fitness and total amount of physical activity affect risk of musculoskeletal injuries. People who are physically fit have a lower risk of injury than people who are not. People who do more activity generally have a higher risk of injury than people who do less activity. So what should people do if they want to be active and safe? The best strategies are to:

- Be regularly physically active to increase physical fitness; and
- Follow the other guidance in this chapter (especially increasing physical activity gradually over time) to minimize the injury risk from doing medium to high amounts of activity.
- Following these strategies may reduce *overall* injury risk. Active people are more likely to have an activity related injury than inactive people. But they appear less likely to have non-activity-related injuries, such as work-related injuries or injuries that occur around the home or from motor vehicle crashes.

Key Guidelines for Safe Physical Activity

To do physical activity safely and reduce risk of injuries and other adverse events, people should:

- Understand the risks and yet be confident that physical activity is safe for almost everyone.
- Choose to do types of physical activity that are appropriate for their current fitness level and health goals, because some activities are safer than others.
- Increase physical activity gradually over time whenever more activity is necessary to meet guidelines or health goals. Inactive people should "start low and go slow" by gradually increasing how often and how long activities are done.
- Protect themselves by using appropriate gear and sports equipment, looking for safe environments, following rules and policies, and making sensible choices about when, where, and how to be active.
- Be under the care of a health-care provider if they have chronic conditions or symptoms. People with chronic conditions and symptoms should consult their health-care provider about the types and amounts of activity appropriate for them.

Choose Appropriate Types and Amounts of Activity

People can reduce their risk of injury by choosing appropriate types of activity. The safest activities are moderate intensity and low impact, and don't involve purposeful collision or contact.

Walking for exercise, gardening or yard work, bicycling or exercise cycling, dancing, swimming, and golf are activities with the lowest injury rates. In the amounts commonly done by adults, walking (a moderate-intensity and low-impact activity) has a third or less of the injury risk of running (a vigorous-intensity and higher impact activity).

The risk of injury for a type of physical activity can also differ according to the purpose of the activity. For example, recreational bicycling or bicycling for transportation leads to fewer injuries than training for and competing in bicycle races.

People who have had a past injury are at risk of injuring that body part again. The risk of injury can be reduced by performing appropriate amounts of activity and setting appropriate personal goals. Performing a variety of different physical activities may also reduce the risk of overuse injury.

The risk of injury to bones, muscles, and joints is directly related to the gap between a person's usual level of activity and a new level of activity.

? Learning Activity

Find out more about specific physical activities that might interest you: Physical Activity Cards.

Increase Physical Activity Gradually Over Time

Scientific studies indicate that the risk of injury to bones, muscles, and joints is directly related to the gap between a person's usual level of activity and a new level of activity. The size of this gap is called the amount of overload. Creating a small overload and waiting for the body to adapt and recover reduces the risk of injury. When amounts of physical activity need to be increased to meet the Guidelines or personal goals, physical activity should be increased gradually over time, no matter what the person's current level of physical activity.

Scientists have not established a standard for how to gradually increase physical activity over time. The following recommendations give general guidance for inactive people and those with low levels of physical activity on how to increase physical activity:

Use relative intensity (intensity of the activity relative to a person's fitness) to guide the level of effort for aerobic activity.

Generally start with relatively moderate-intensity aerobic activity. Avoid relatively vigorous-intensity activity, such as shoveling snow or running. Adults with a low level of fitness may need to start with light activity, or a mix of light- to moderate-intensity activity.

First, increase the number of minutes per session (duration), and the number of days per week (frequency) of moderate-intensity activity. Later, if desired, increase the intensity.

Pay attention to the relative size of the increase in physical activity each week, as this is related to injury risk. For example, a 20-minute increase each week is safer for a person who does 200 minutes a week of walking (a 10 percent increase), than for a person who does 40 minutes a week (a 50 percent increase).

The available scientific evidence suggests that adding a small and comfortable amount of light- to moderate–intensity activity, such as 5 to 15 minutes of walking per session, 2 to 3 times a week, to one's usual activities has a low risk of musculoskeletal injury and no known risk of severe cardiac events. Because this range is rather wide, people should consider three factors in individualizing their rate of increase: age, level of fitness, and prior experience.

The amount of time required to adapt to a new level of activity probably depends on age. Youth and young adults probably can safely increase activity by small amounts every week or 2. Older adults appear to require more time to adapt to a new level of activity, in the range of 2 to 4 weeks.

Level of Fitness

Less fit adults are at higher risk of injury when doing a given amount of activity, compared to fitter adults. Slower rates of increase over time may reduce injury risk. This guidance applies to overweight and obese adults, as they are commonly less physically fit.

Prior Experience

People can use their experience to learn to increase physical activity over time in ways that minimize the risk of overuse injury. Generally, if an overuse injury occurred in the past with a certain rate of progression, a person should increase activity more slowly the next time.

Take Appropriate Precautions

Taking appropriate precautions means using the right gear and equipment, choosing safe environments in which to be active, following rules and policies, and making sensible choices about how, when, and where to be active.

Use Protective Gear and Appropriate Equipment

Using personal protective gear can reduce the frequency of injury. Personal protective gear is something worn by a person to protect a specific body part. Examples include helmets, eyewear and goggles, shin guards, elbow and knee pads, and mouth guards.

Using appropriate sports equipment can also reduce risk of injury. Sports equipment refers to sport or activity-specific tools, such as balls, bats, sticks, and shoes.

For the most benefit, protective equipment and gear should be:

- The right equipment for the activity
- Appropriately fitted
- Appropriately maintained
- Used consistently and correctly.

Be Active in Safe Environments

People can reduce their injury risks by paying attention to the places they choose to be active. To help themselves stay safe, people can look for:

- Physical separation from motor vehicles, such as sidewalks, walking paths, or bike lanes;
- Neighborhoods with traffic-calming measures that slow down traffic;
- Places to be active that are well-lighted, where other people are present, and that are well-maintained (no litter, broken windows);
- Shock-absorbing surfaces on playgrounds;
- Well-maintained playing fields and courts without holes or obstacles;
- Breakaway bases at baseball and softball fields; and
- Padded and anchored goals and goal posts at soccer and football fields.

Follow Rules and Policies That Promote Safety

Rules, policies, legislation, and laws are potentially the most effective and wide-reaching way to reduce activity-related injuries. To get the benefit, individuals should look for and follow these rules, policies, and laws. For example, policies that promote the use of bicycle helmets reduce the risk of head injury among cyclists. Rules against diving into shallow water at swimming pools prevent head and neck injuries.

Make Sensible Choices about How, When, and Where To Be Active

A person's choices can obviously influence the risk of adverse events. By making sensible choices, injuries and adverse events can be prevented. Consider weather conditions, such as extremes of heat and cold. For example, during very hot and humid weather, people lessen the chances of dehydration and heat stress by:

- Exercising in the cool of early morning as opposed to mid-day heat;
- Switching to indoor activities (playing basketball in the gym rather than on the playground);
- Changing the type of activity (swimming rather than playing soccer);
- Lowering the intensity of activity (walking rather than running); and
- Paying close attention to rest, shade, drinking enough fluids, and other ways to minimize effects of heat.

Inactive people who gradually progress over time to relatively moderate-intensity activity have no known risk of sudden cardiac events, and very low risk of bone, muscle, or joint injuries.

Exposure to air pollution is associated with several adverse health outcomes, including asthma attacks and abnormal heart rhythms. People who can modify the location or time of exercise may wish to reduce these risks by exercising away from heavy traffic and industrial sites, especially during rush hour or times when pollution is known to be high. However, current evidence indicates that the benefits of being active, even in polluted air, outweigh the risk of being inactive.

Quick Review

What are some ways that you can reduce the risk of injury when engaging in physical activity?

Advice from Health-Care Providers

The protective value of a medical consultation for persons with or without chronic diseases who are interested in increasing their physical activity level is not established. People without diagnosed chronic conditions (such as diabetes, heart disease, or osteoarthritis) and who do not have symptoms (such as chest pain or pressure, dizziness, or joint pain) do not need to consult a health-care provider about physical activity.

Inactive people who gradually progress over time to relatively moderate-intensity activity have no known risk of sudden cardiac events, and very low risk of bone, muscle, or joint injuries. A person who is habitually active with moderate-intensity activity can gradually increase to vigorous intensity without needing to consult a health-care provider. People who develop new symptoms when increasing their levels of activity should consult a health-care provider.

Health-care providers can provide useful personalized advice on how to reduce risk of injuries. For people who wish to seek the advice of a health-care provider, it is particularly appropriate to do so when contemplating vigorous-intensity activity, because the risks of this activity are higher than the risks of moderate-intensity activity.

The choice of appropriate types and amounts of physical activity can be affected by chronic conditions. People with symptoms or known chronic conditions should be under the regular care of a health-care provider. In consultation with their provider, they can develop a physical activity plan that is appropriate for them. People with chronic conditions typically find that moderate-intensity activity is safe and beneficial. However, they may need to take special precautions. For example, people with diabetes need to pay special attention to blood sugar control and proper footwear during activity.

Gradually Increasing Physical Activity over Time: Real-Life Examples

Here are two examples that show how people at different ages, levels of fitness, and levels of experience can safely become more active over time.

Bill: A Man Who Has Been Inactive for Many Years

Bill wants to work his way up to the equivalent of 180 to 210 minutes (3 hours to 3 hours and 30 minutes) of walking a week. On weekdays he has time for up to 45 minutes of walking, and he plans to do something physically active each weekend. He decides to start with walking because it is moderate intensity and has a low risk of injury.

The first week, Bill starts at a low level. He walks 10 minutes a day 3 days a week. Sometimes he divides the 10 minutes a day into two sessions. He prefers to alternate rest days and active days. (Total = 30 minutes a week.)
Between weeks 3 and 8, Bill increases duration by adding 5 minutes a day and continues walking on 3 non-consecutive days each week. The weekly increase is 15 minutes. (Week 3 total = 45 minutes. Week 8 total = 120 minutes or 2 hours.)

In week 9, Bill adds another day of moderate intensity activity on the weekend, and starts doing a variety of activities, including biking, hiking, and an aerobics class. Gradually increasing the minutes of activity, by week 12 he is doing 60 minutes or more of moderate-intensity activity on the weekend. Reaching his goal: Over 3 months, Bill has increased to a total of 180 moderate-intensity minutes a week.

Kim: An Active Woman

Kim currently does 150 minutes (2 hours and 30 minutes) a week of moderate-intensity activity. She wants to work up to at least the equivalent of 300 minutes (5 hours) of moderate-intensity activity a week. She also wants to shift some of that moderate intensity activity to vigorous-intensity activity. Her current 150 minutes a week includes:

- Thirty minutes of mowing the grass 1 day a week;
- Thirty minutes of brisk walking 4 days a week; and
- Fifteen minutes of muscle-strengthening exercises 2 days a week.
- Increasing frequency and duration:

Over a month, Kim adds walking on another weekday, and she gradually adds 15 minutes of moderate-intensity activity on each of the 5 walking days each week. This provides an additional 105 minutes (1 hour and 45 minutes) of moderate–intensity activity.

- **Increasing intensity:** Over the next month, Kim decides to replace some walking with jogging. Instead of walking 45 minutes, she walks for 30 minutes and jogs for 15 minutes on each weekday, providing the equivalent of 300 minutes a week of moderate-intensity physical activity from her walking and jogging.
- **Reaching her goal:** After these increases, Kim is doing a total of 180 minutes of moderate-intensity activity each week (walking and mowing) and also doing 75 minutes (1 hour and 15 minutes) of vigorous–intensity jogging. One minute of vigorous-intensity activity is about the same as 2 minutes of moderate intensity activity, so she is now doing the equivalent of 330 moderate-intensity minutes (5 hours and 30 minutes) a week. She has more than met her goal.

Which physical activity plan would work best for **you** to increase your physical activity over time: Bill's or Kim's? Why?

Sources

Source: The Physical Activity Guidelines for Americans, Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services. http://www.health.gov/paguidelines/guidelines/

? Exercise 5.5.1

1. Why is flexibility important for overall health?
2. Name one type of stretching exercise.
3. How can regular stretching reduce the risk of injury?

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5.6: Pregnancy and Disabilities

Keeping Active during Pregnancy and with Disabilities

All Americans should be physically active to improve overall health and fitness and to prevent many adverse health outcomes. However, some people have conditions that raise special issues about recommended types and amounts of physical activity. This chapter provides guidance on physical activity for healthy women who are pregnant and for people with disabilities.

Physical Activity for Women during Pregnancy and the Postpartum Period

Women who are pregnant and those who've recently had a baby should be under the regular care of a health-care provider. Moderate-intensity physical activity is generally safe for women with uncomplicated pregnancies, but women should talk with their provider about how to adjust the amounts and types of activity while they are pregnant and right after the baby's birth.

During pregnancy, women should avoid:

- Doing activities with high risk of falling or abdominal trauma, including contact or collision sports, such as horseback riding, soccer, basketball, and downhill skiing.
- Physical activity during pregnancy benefits a woman's overall health. For example, moderate-intensity physical activity by healthy women during pregnancy maintains or increases cardiorespiratory fitness.

Strong scientific evidence shows that the risks of moderate-intensity activity done by healthy women during pregnancy are very low, and do not increase risk of low birth weight, preterm delivery, or early pregnancy loss. Some evidence suggests that physical activity reduces the risk of pregnancy complications, such as preeclampsia and gestational diabetes, and reduces the length of labor, but this evidence is not conclusive.

During a normal postpartum period, regular physical activity continues to benefit a woman's overall health. Studies show that moderate-intensity physical activity during the period following the birth of a child increases a woman's cardiorespiratory fitness and improves her mood. Such activity does not appear to have adverse effects on breast milk volume, breast milk composition, or infant growth.

Physical activity also helps women achieve and maintain a healthy weight during the postpartum period, and when combined with caloric restriction, helps promote weight loss.

Key Guidelines for Women during Pregnancy and the Postpartum Period

Women who are pregnant should be under the care of a health-care provider with whom they can discuss how to adjust amounts of physical activity during pregnancy and the postpartum period. Unless a woman has medical reasons to avoid physical activity during pregnancy, she can begin or continue moderate-intensity aerobic physical activity during her pregnancy and after the baby is born.

When beginning physical activity during pregnancy, women should increase the amount gradually over time. The effects of vigorous-intensity aerobic activity during pregnancy have not been studied carefully, so there is no basis for recommending that women should begin vigorous-intensity activity during pregnancy.

Women who habitually do vigorous-intensity activity or high amounts of activity or strength training should continue to be physically active during pregnancy and after giving birth. They generally do not need to drastically reduce their activity levels, provided that they remain healthy and discuss with their health-care provider how to adjust activity levels during this time.

During pregnancy, women should avoid doing exercises involving lying on their back after the first trimester of pregnancy. They should also avoid doing activities that increase the risk of falling or abdominal trauma, including contact or collision sports, such as horseback riding, downhill skiing, soccer, and basketball.

Physical Activity for People with Disabilities

The benefits of physical activity for people with disabilities have been studied in diverse groups. These groups include stroke victims, people with spinal cord injury, multiple sclerosis, Parkinson's disease, muscular dystrophy, cerebral palsy, traumatic brain injury, limb amputations, mental illness, intellectual disability, and dementia.

Overall, the evidence shows that regular physical activity provides important health benefits for people with disabilities. The benefits include improved cardiovascular and muscle fitness, improved mental health, and better ability to do tasks of daily life. Sufficient evidence now exists to recommend that adults with disabilities should get regular physical activity.

People with disabilities are encouraged to get advice from professionals with experience in physical activity and disability because matching activity to abilities can require modifying physical activity in many different ways. Some people with disabilities also need help with their exercise program. For example, some people may need supervision when performing muscle-strengthening activities, such as lifting weights.

Sources

Keeping Active during Pregnancy and with Disabilities: The Physical Activity Guidelines for Americans, Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services. http://www.health.gov/paguidelines/guidelines/

? Exercise 5.6.1

1. Define sedentary behavior.
2. What are two health risks associated with prolonged sedentary time?
3. Name one way to reduce sedentary behavior during the day.

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5.7: Community Efforts to Increase Physical Activity

The low level of physical activity among Americans is a major contributor to the burden of chronic disease. This burden is costly in terms of quality of life and economic resources needed to provide medical care. Like life in other modern societies around the world, life in the United States requires very little daily physical activity. The amount of physical activity we do is largely a matter of personal choice and the environmental conditions under which we live. So far, little progress has been made in meeting our national health objectives for physical activity.

Based on a careful review of the science, the *Physical Activity Guidelines* provides essential guidance to help Americans achieve the health benefits of regular physical activity. However, providing guidance by itself is not enough to produce change. Action is necessary. Regular physical activity needs to be made the easy choice for Americans.

To accomplish this goal, public health research suggests the use of a "socio-ecologic" approach. This comprehensive approach involves action at all levels of society: individual, interpersonal, organizational, community, and public policy.

What Can Communities and Government Do to Help People Be Active?

Actions by communities and government can influence whether regular physical activity is an easy choice. Communities can provide many opportunities for physical activity, such as walking trails, bicycle lanes on roads, sidewalks, and sports fields. Organizations in the community have a role to play as well. Schools, places of worship, worksites, and community centers can provide opportunities and encouragement for physical activity.

Involve Many Sectors in Promoting Physical Activity

Interventions to improve access should also include outreach that increases awareness of the opportunity to be active.

Policies and programs that support street-scale design principles and practices that promote physical activity. For example, these types of policies and programs use crosswalks, sidewalks, traffic calming, and other safety measures to make it easier and safer for people to choose active transportation.

Policies and programs that support community-scale design principles and practices that promote physical activity. Community-scale design includes zoning that facilitates bicycling and walking by allowing schools, housing, and businesses to be built near one another.

The following list identifies relevant sectors and illustrates roles they play in promoting physical activity. The division of functions in the community into the following sectors does not use mutually exclusive categories. These sectors were chosen simply to illustrate how parts of the community have a role to play in promoting physical activity. Some communities may use different names and divisions of functions.

- **Parks and recreation.** This sector plays a lead role in providing access to places for active recreation, such as playgrounds, hiking and biking trails, basketball courts, sports fields, and swimming pools.
- **Concern about crime can deter people from outdoors recreation.** Law enforcement can promote a safe environment that facilitates outdoor activity.
- **Urban planning.***The Guide to Community Preventive Services* recommends both street-scale and community-scale design principles to promote physical activity. Urban planners have a lead role in implementing design principles to promote physical activity.
- **Transportation.** The transportation sector has a lead role in designing and implementing options that provide areas for safe walking and bicycling. Mass transit systems also promote walking, as people typically walk to and from transit stops. Programs that support safe walking and bicycling to school help children be more physically active.
- **Education.** The education sector takes a lead role in providing physical education, after-school sports, and public access to school facilities during after-school hours.
- **Architecture.** Architects and builders can design and construct buildings with active options, such as access to stairs. Campuses should allow pedestrians pleasant and efficient methods of walking within and between buildings.
- **Employers and private organizations.** Employers can encourage workers to be physically active, facilitate active transportation by supplying showers and secure bicycle storage, and provide other incentives to be active. Private and faith-based organizations can support community physical activity initiatives financially or by providing space for programs. Health

and fitness facilities and community programs can provide access to exercise programs and equipment for a broad range of people, including older adults and people with disabilities. Local sports organizations can organize road races and events for the public. Senior centers can provide exercise programs for older adults.

- **Health care.** Health-care providers can assess, counsel, and advise patients on physical activity and how to do it safely. Health-care providers can model healthy behaviors by being physically active themselves.
- **Public health**. Public health departments can monitor community progress in providing places and opportunities to be physically active and can track changes in the proportion of the population meeting the *Physical Activity Guidelines for Americans*. They can also take the lead in setting objectives and coordinating activities among sectors. Public health departments and organizations can disseminate appropriate messages and information to the public about physical activity.

? Learning Activity

Find out steps you can take to encourage your employees to take the stairs and increase their physical activity while at work at *StairWELL*.

Use this Walkability audit tool to determine how safe and attractive the walking environment is at your work site.

? Optional Learning Activity

Implement a Fitness Promotion program at your workplace (e.g., develop signs to post by elevators encouraging people to take the stairs, get permission to post the signs, observe to see if anyone reads the signs and actually uses the stairs; start a noontime walking club, develop a walking route that is timed and measured for distance, recruit club members; launch a campaign to get people to park in the far end of the parking lot).

Sources

Source: The Physical Activity Guidelines for Americans Office of Disease Prevention & Health Promotion, U.S. Department of Health and Human Services.http://www.health.gov/paguidelines/guidelines/

? Exercise 5.7.1

1. What is the recommended amount of moderate-intensity physical activity per week for adults?
2. Why is it important to include strength training in your exercise routine?
3. How can gradually increasing physical activity improve adherence?

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CHAPTER OVERVIEW

6: Substance Abuse and Addictions

Learning Objectives

- understand a set of fundamentals about neurobiology and how drugs of abuse change the brain
- recognize that drug addiction is a treatable, chronic brain disease
- experience the process of scientific inquiry and develop an enhanced understanding of the nature and methods of science
- appreciate the role of science in society and the relationship between basic science and human health. understand that drug abuse initially is a voluntary behavior
- to define drug addiction as the continued compulsive drug abuse despite known adverse health or social consequences
- understand that drug abuse and addiction are associated with long-term physical and functional changes in the brain
- recognize that addiction is influenced by biological factors (for example, genetics and age) and by the social and behavioral context of drug use.

6.1: Drugs
6.2: Alcohol
6.3: Tobacco
6.4: Misuse of Prescription Drugs
6.5: Drugs, Abuse, and Addiction

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6.1: Drugs

Drug abuse is a serious public health problem that affects almost every community and family in some way. Each year drug abuse results in around 40 million serious illnesses or injuries among people in the United States. Abused drugs include:

- Club drugs
- Amphetamines
- Anabolic steroids
- Cocaine
- Heroin
- Inhalants
- Marijuana
- Prescription drugs

Drug abuse also plays a role in many major social problems, such as drugged driving, violence, stress and child abuse. Drug abuse can lead to homelessness, crime, and missed work or problems with keeping a job. There are different types of treatment for drug abuse. But the best is to prevent drug abuse in the first place.

? Learning Activity

Watch this video about the Long Term Effects of Drugs on the Brain.

- Explain how drug addiction is a brain disease.
- What are three reasons that make finding answers to the health impact of drug addiction difficult to do?

Club Drugs

The term club drug refers to a wide variety of dangerous drugs. These drugs are often used by young adults at all-night dance parties, dance clubs and bars. They include

- Methylenedioxymethamphetamine (MDMA), also known as Ecstasy, XTC, X, Adam, Clarity and Lover's Speed
- Gamma-hydroxybutyrate (GHB), also known as Grievous Bodily Harm, G, Liquid Ecstasy and Georgia Home Boy
- Ketamine, also known as Special K, K, Vitamin K, Cat Valium
- Rohypnol, also known as Roofies, Rophies, Roche, Forget-me Pill
- Methamphetamine, also known as Speed, Ice, Chalk, Meth, Crystal, Crank, Fire, Glass
- Lysergic Acid Diethylamide (LSD), also known as or Acid, Boomers, Yellow Sunshines

Club drugs have become more common in recent years. Sometimes people use them to commit sexual assaults. Club drugs can cause serious health problems and sometimes death. They are even more dangerous if you use them with alcohol.

What Type of Drugs are Club Drugs?

Club drugs are a pharmacologically heterogeneous group of psychoactive drugs that tend to be abused by teens and young adults at bars, nightclubs, concerts, and parties. Gamma hydroxybutyrate (GHB), Rohypnol, ketamine, as well as MDMA (ecstasy) and methamphetamine are some of the drugs included in this group.

- GHB (Xyrem) is a central nervous system (CNS) depressant that was approved by the Food and Drug Administration (FDA) in 2002 for use in the treatment of narcolepsy (a sleep disorder). This approval came with severe restrictions, including its use only for the treatment of narcolepsy, and the requirement for a patient registry monitored by the FDA. GHB is also a metabolite of the inhibitory neurotransmitter gamma-aminobutyric acid (GABA). It exists naturally in the brain, but at much lower concentrations than those found when GHB is abused.
- Rohypnol (flunitrazepam) use began gaining popularity in the United States in the early 1990s. It is a benzodiazepine (chemically similar to sedative-hypnotic drugs such as Valium or Xanax), but it is not approved for medical use in this country, and its importation is banned.
- Ketamine is a dissociative anesthetic, mostly used in veterinary practice.

How Are Club Drugs Abused?

- GHB and Rohypnol are available in odorless, colorless, and tasteless forms that are frequently combined with alcohol and other beverages. Both drugs have been used to commit sexual assaults (also known as “date rape,” “drug rape,” “acquaintance rape,” or “drug-assisted” assault) due to their ability to sedate and incapacitate unsuspecting victims, preventing them from resisting sexual assault.
- GHB is usually ingested orally, either in liquid or powder form, while Rohypnol is typically taken orally in pill form. Recent reports, however, have shown that Rohypnol is being ground up and snorted.
- Both GHB and Rohypnol are also abused for their intoxicating effects, similar to other CNS depressants.
- GHB also has anabolic effects (it stimulates protein synthesis) and has been used by bodybuilders to aid in fat reduction and muscle building.
- Ketamine is usually snorted or injected intramuscularly.

How Do Club Drugs Affect the Brain?

- At high doses, GHB’s sedative effects may result in sleep, coma, or death.
- Rohypnol can produce anterograde amnesia, in which individuals may not remember events they experienced while under the influence of the drug.
- Ketamine is a dissociative anesthetic, so called because it distorts perceptions of sight and sound and produces feelings of detachment from the environment and self. Low-dose intoxication results in impaired attention, learning ability, and memory. At higher doses, ketamine can cause dreamlike states and hallucinations; and at higher doses still, ketamine can cause delirium and amnesia.

Addictive Potential

- Repeated use of GHB may lead to withdrawal effects, including insomnia, anxiety, tremors, and sweating. Severe withdrawal reactions have been reported among patients presenting from an overdose of GHB or related compounds, especially if other drugs or alcohol are involved.
- Like other benzodiazepines, chronic use of Rohypnol can produce tolerance, physical dependence, and addiction.
- There have been reports of people binging on ketamine, a behavior that is similar to that seen in some cocaine- or amphetamine-dependent individuals. Ketamine users can develop signs of tolerance and cravings for the drug.

What Other Adverse Effects Do Club Drugs Have on Health?

Uncertainties about the sources, chemicals, and possible contaminants used to manufacture many club drugs make it extremely difficult to determine toxicity and associated medical consequences. Nonetheless, we do know that:

- Coma and seizures can occur following use of GHB. Combined use with other drugs such as alcohol can result in nausea and breathing difficulties. GHB has been involved in poisonings, overdoses, date rapes, and deaths.
- Rohypnol may be lethal when mixed with alcohol and/or other CNS depressants.
- Ketamine, in high doses, can cause impaired motor function, high blood pressure, and potentially fatal respiratory problems.

Methamphetamine

Methamphetamine is a very addictive stimulant drug. It can be smoked, injected, inhaled or taken by mouth. It has many street names, such as speed, meth, and chalk. Methamphetamine hydrochloride, the crystal form inhaled by smoking, is referred to as ice, crystal, glass and tina.

Methamphetamine affects the brain and can create feelings of pleasure, increase energy and elevate mood. Abusers may become addicted quickly, needing higher doses more often. Adverse health effects include irregular heartbeat, increased blood pressure and a variety of psychological problems. Long-term effects may include severe mental disorders, memory loss and severe dental problems.

What Type of Drug is Methamphetamine?

Methamphetamine is a central nervous system stimulant drug that is similar in structure to amphetamine. Due to its high potential for abuse, methamphetamine is classified as a Schedule II drug and is available only through a prescription that cannot be refilled. Although methamphetamine can be prescribed by a doctor, its medical uses are limited, and the doses that are prescribed are much

lower than those typically abused. Most of the methamphetamine abused in this country comes from foreign or domestic superlabs, although it can also be made in small, illegal laboratories, where its production endangers the people in the labs, neighbors, and the environment.

How Is Methamphetamine Abused?

Methamphetamine is a white, odorless, bitter-tasting crystalline powder that easily dissolves in water or alcohol and is taken orally, intranasally (snorting the powder), by needle injection, or by smoking.

How Does Methamphetamine Affect the Brain?

Methamphetamine increases the release and blocks the reuptake of the brain chemical (or neurotransmitter) dopamine, leading to high levels of the chemical in the brain—a common mechanism of action for most drugs of abuse. Dopamine is involved in reward, motivation, the experience of pleasure, and motor function. Methamphetamine's ability to release dopamine rapidly in reward regions of the brain produces the intense euphoria, or "rush," that many users feel after snorting, smoking, or injecting the drug.

Chronic methamphetamine abuse significantly changes how the brain functions. Noninvasive human brain imaging studies have shown alterations in the activity of the dopamine system that are associated with reduced motor skills and impaired verbal learning. Recent studies in chronic methamphetamine abusers have also revealed severe structural and functional changes in areas of the brain associated with emotion and memory, which may account for many of the emotional and cognitive problems observed in chronic methamphetamine abusers.

Repeated methamphetamine abuse can also lead to addiction—a chronic, relapsing disease characterized by compulsive drug seeking and use, which is accompanied by chemical and molecular changes in the brain. Some of these changes persist long after methamphetamine abuse is stopped. Reversal of some of the changes, however, may be observed after sustained periods of abstinence (e.g., more than 1 year).

What Other Adverse Effects Does Methamphetamine Have on Health?

Taking even small amounts of methamphetamine can result in many of the same physical effects as those of other stimulants, such as cocaine or amphetamines, including increased wakefulness, increased physical activity, decreased appetite, increased respiration, rapid heart rate, irregular heartbeat, increased blood pressure, and hyperthermia.

Long-term methamphetamine abuse has many negative health consequences, including extreme weight loss, severe dental problems ("meth mouth"), anxiety, confusion, insomnia, mood disturbances, and violent behavior. Chronic methamphetamine abusers can also display a number of psychotic features, including paranoia, visual and auditory hallucinations, and delusions (for example, the sensation of insects crawling under the skin).

Transmission of HIV and hepatitis B and C can be consequences of methamphetamine abuse. The intoxicating effects of methamphetamine, regardless of how it is taken, can also alter judgment and inhibition and can lead people to engage in unsafe behaviors, including risky sexual behavior. Among abusers who inject the drug, HIV/AIDS and other infectious diseases can be spread through contaminated needles, syringes, and other injection equipment that is used by more than one person. Methamphetamine abuse may also worsen the progression of HIV/AIDS and its consequences. Studies of methamphetamine abusers who are HIV-positive indicate that HIV causes greater neuronal injury and cognitive impairment for individuals in this group compared with HIV-positive people who do not use the drug.

Anabolic Steroids

Anabolic-androgenic steroids (AAS) are synthetically produced variants of the naturally occurring male sex hormone testosterone. "Anabolic" refers to muscle-building, and "androgenic" refers to increased male sexual characteristics. "Steroids" refers to the class of drugs. These drugs can be legally prescribed to treat conditions resulting from steroid hormone deficiency, such as delayed puberty, as well as diseases that result in loss of lean muscle mass, such as cancer and AIDS.

How Are AAS Abused?

Some people, both athletes and non-athletes, abuse AAS in an attempt to enhance performance and/or improve physical appearance. AAS are taken orally or injected, typically in cycles rather than continuously. "Cycling" refers to a pattern of use in which steroids are taken for periods of weeks or months, after which use is stopped for a period of time and then restarted. In

addition, users often combine several different types of steroids in an attempt to maximize their effectiveness, a practice referred to as “stacking.”

How Do AAS Affect the Brain?

The acute effects of AAS in the brain are substantially different from those of other drugs of abuse. The most important difference is that AAS are not euphorigenic, meaning they do not trigger rapid increases in the neurotransmitter dopamine, which is responsible for the “high” that often drives substance abuse behaviors. However, long-term use of AAS can eventually have an impact on some of the same brain pathways and chemicals—such as dopamine, serotonin, and opioid systems—that are affected by other drugs of abuse. Considering the combined effect of their complex direct and indirect actions, it is not surprising that AAS can affect mood and behavior in significant ways.

AAS and Mental Health

Preclinical, clinical, and anecdotal reports suggest that steroids may contribute to psychiatric dysfunction. Research shows that abuse of anabolic steroids may lead to aggression and other adverse effects. For example, although many users report feeling good about themselves while on anabolic steroids, extreme mood swings can also occur, including manic-like symptoms that could lead to violence. Researchers have also observed that users may suffer from paranoid jealousy, extreme irritability, delusions, and impaired judgment stemming from feelings of invincibility.

Addictive Potential

Animal studies have shown that AAS are reinforcing—that is, animals will self-administer AAS when given the opportunity, just as they do with other addictive drugs. This property is more difficult to demonstrate in humans, but the potential for AAS abusers to become addicted is consistent with their continued abuse despite physical problems and negative effects on social relations. Also, steroid abusers typically spend large amounts of time and money obtaining the drug: this is another indication of addiction. Individuals who abuse steroids can experience withdrawal symptoms when they stop taking AAS—these include mood swings, fatigue, restlessness, loss of appetite, insomnia, reduced sex drive, and steroid cravings, all of which may contribute to continued abuse. One of the most dangerous withdrawal symptoms is depression—when persistent, it can sometimes lead to suicide attempts.

Research also indicates that some users might turn to other drugs to alleviate some of the negative effects of AAS. For example, a study of 227 men admitted in 1999 to a private treatment center for dependence on heroin or other opioids found that 9.3 percent had abused AAS before trying any other illicit drug. Of these, 86 percent first used opioids to counteract insomnia and irritability resulting from the steroids.

What Other Adverse Effects Do AAS Have on Health?

Steroid abuse can lead to serious, even irreversible health problems. Some of the most dangerous among these include liver damage; jaundice (yellowish pigmentation of skin, tissues, and body fluids); fluid retention; high blood pressure; increases in LDL (“bad” cholesterol); and decreases in HDL (“good” cholesterol). Other reported effects include renal failure, severe acne, and trembling. In addition, there are some gender- and age-specific adverse effects:

- For *men*—shrinking of the testicles, reduced sperm count, infertility, baldness, development of breasts, increased risk for prostate cancer
- For *women*—growth of facial hair, male-pattern baldness, changes in or cessation of the menstrual cycle, enlargement of the clitoris, deepened voice
- For *adolescents*—stunted growth due to premature skeletal maturation and accelerated puberty changes; risk of not reaching expected height if AAS is taken before the typical adolescent growth spurt

In addition, people who inject AAS run the added risk of contracting or transmitting HIV/AIDS or hepatitis, which causes serious damage to the liver.

? Learning Activity

Watch this video titled: Psychoactive Drugs and take the ungraded quiz.

- What factors impact the influence of a drug?
- What can tolerance of a drug cause?

Cocaine

Cocaine is a powerful drug that stimulates the brain. People who use it can form a strong addiction. They may have to use more and more of the drug to get high. It's sold on the street as a fine, white powder. There are two forms of cocaine: hydrochloride salt and freebase. The salt dissolves in water. People can take it in a vein or in the nose. The freebase form can be smoked. Crack is the street name of a smokable form of cocaine.

No matter how cocaine is taken, it is dangerous. Some of the most common serious problems include

- Heart problems, including heart attacks
- Respiratory effects, including respiratory failure
- Nervous system problems, including strokes
- Digestive problems

Any of these can be fatal. Using cocaine with alcohol is a common cause of drug-related death.

What Type of Drug is Cocaine?

Cocaine is a powerfully addictive stimulant drug. The powdered hydrochloride salt form of cocaine can be snorted or dissolved in water and then injected. Crack is the street name given to the form of cocaine that has been processed to make a rock crystal, which, when heated, produces vapors that are smoked. The term "crack" refers to the crackling sound produced by the rock as it is heated.

How Is Cocaine Abused?

Three routes of administration are commonly used for cocaine: snorting, injecting, and smoking. Snorting is the process of inhaling cocaine powder through the nose, where it is absorbed into the bloodstream through the nasal tissues. Injecting is the use of a needle to insert the drug directly into the bloodstream. Smoking involves inhaling cocaine vapor or smoke into the lungs, where absorption into the bloodstream is as rapid as it is by injection. All three methods of cocaine abuse can lead to addiction and other severe health problems, including increasing the risk of contracting HIV/AIDS and other infectious diseases.

The intensity and duration of cocaine's effects—which include increased energy, reduced fatigue, and mental alertness—depend on the route of drug administration. The faster cocaine is absorbed into the bloodstream and delivered to the brain, the more intense the high. Injecting or smoking cocaine produces a quicker, stronger high than snorting. On the other hand, faster absorption usually means shorter duration of action: the high from snorting cocaine may last 15 to 30 minutes, but the high from smoking may last only 5 to 10 minutes. In order to sustain the high, a cocaine abuser has to administer the drug again. For this reason, cocaine is sometimes abused in binges—taken repeatedly within a relatively short period of time, at increasingly higher doses.

How Does Cocaine Affect the Brain?

Cocaine is a strong central nervous system stimulant that increases levels of dopamine, a brain chemical (or neurotransmitter) associated with pleasure and movement, in the brain's reward circuit. Certain brain cells, or neurons, use dopamine to communicate. Normally, dopamine is released by a neuron in response to a pleasurable signal (e.g., the smell of good food), and then recycled back into the cell that released it, thus shutting off the signal between neurons.

Cocaine acts by preventing the dopamine from being recycled, causing excessive amounts of the neurotransmitter to build up, amplifying the message to and response of the receiving neuron, and ultimately disrupting normal communication. It is this excess of dopamine that is responsible for cocaine's euphoric effects. With repeated use, cocaine can cause long-term changes in the brain's reward system and in other brain systems as well, which may eventually lead to addiction. With repeated use, tolerance to the cocaine high also often develops. Many cocaine abusers report that they seek but fail to achieve as much pleasure as they did from their first exposure. Some users will increase their dose in an attempt to intensify and prolong the euphoria, but this can also increase the risk of adverse psychological or physiological effects.

What Adverse Effects Does Cocaine Have on Health?

Abusing cocaine has a variety of adverse effects on the body. For example, cocaine constricts blood vessels, dilates pupils, and increases body temperature, heart rate, and blood pressure. It can also cause headaches and gastrointestinal complications such as abdominal pain and nausea. Because cocaine tends to decrease appetite, chronic users can become malnourished as well.

Different methods of taking cocaine can produce different adverse effects. Regular intranasal use (snorting) of cocaine, for example, can lead to loss of the sense of smell; nosebleeds; problems with swallowing; hoarseness; and a chronically runny nose. Ingesting cocaine can cause severe bowel gangrene as a result of reduced blood flow. Injecting cocaine can bring about severe allergic reactions and increased risk for contracting HIV/AIDS and other blood-borne diseases. Binge-patterned cocaine use may lead to irritability, restlessness, and anxiety. Cocaine abusers can also experience severe paranoia—a temporary state of full-blown paranoid psychosis—in which they lose touch with reality and experience auditory hallucinations.

Regardless of the route or frequency of use, cocaine abusers can experience acute cardiovascular or cerebrovascular emergencies, such as a heart attack or stroke, which may cause sudden death. Cocaine-related deaths are often a result of cardiac arrest or seizure followed by respiratory arrest.

? Learning Activity

Watch these videos to find out about the effect of drugs on the brain:



- What is one thing you learned from these videos that you didn't know before?

Heroin

Heroin is a drug made from morphine, a natural substance in the seedpod of the Asian poppy plant. Heroin usually appears as a white or brown powder. Heroin can be injected, smoked or snorted. Heroin abuse is a serious problem in the United States. Major health problems from heroin include miscarriages, heart infections and death from overdose. People who inject the drug also risk infectious diseases, including HIV/AIDS and hepatitis.

Regular use of heroin can lead to tolerance. This means users need more and more drug to have the same effect. At higher doses over time, the body becomes dependent on heroin. If dependent users stop heroin, they have withdrawal symptoms. These symptoms include restlessness, muscle and bone pain, diarrhea, vomiting and cold flashes.

Heroin is an opiate drug that is synthesized from morphine, a naturally occurring substance extracted from the seed pod of the Asian opium poppy plant. Heroin usually appears as a white or brown powder or as a black sticky substance, known as "black tar heroin."

How Is Heroin Abused?

Heroin can be injected, snorted/sniffed, or smoked—routes of administration that rapidly deliver the drug to the brain. Injecting is the use of a needle to administer the drug directly into the bloodstream. Snorting is the process of inhaling heroin powder through the nose, where it is absorbed into the bloodstream through the nasal tissues. Smoking involves inhaling heroin smoke into the lungs. All three methods of administering heroin can lead to addiction and other severe health problems.

How Does Heroin Affect the Brain?

Heroin enters the brain, where it is converted to morphine and binds to receptors known as opioid receptors. These receptors are located in many areas of the brain (and in the body), especially those involved in the perception of pain and in reward. Opioid

receptors are also located in the brain stem—important for automatic processes critical for life, such as breathing (respiration), blood pressure, and arousal. Heroin overdoses frequently involve a suppression of respiration.

After an intravenous injection of heroin, users report feeling a surge of euphoria ("rush") accompanied by dry mouth, a warm flushing of the skin, heaviness of the extremities, and clouded mental functioning. Following this initial euphoria, the user goes "on the nod," an alternately wakeful and drowsy state. Users who do not inject the drug may not experience the initial rush, but other effects are the same.

With regular heroin use, tolerance develops, in which the user's physiological (and psychological) response to the drug decreases, and more heroin is needed to achieve the same intensity of effect. Heroin users are at high risk for addiction—it is estimated that about 23 percent of individuals who use heroin become dependent on it.

What Other Adverse Effects Does Heroin Have on Health?

Heroin abuse is associated with serious health conditions, including fatal overdose, spontaneous abortion, and—particularly in users who inject the drug—infectious diseases, including HIV/AIDS and hepatitis. Chronic users may develop collapsed veins, infection of the heart lining and valves, abscesses, and liver or kidney disease. Pulmonary complications, including various types of pneumonia, may result from the poor health of the abuser as well as from heroin's depressing effects on respiration. In addition to the effects of the drug itself, street heroin often contains toxic contaminants or additives that can clog blood vessels leading to the lungs, liver, kidneys, or brain, causing permanent damage to vital organs.

Chronic use of heroin leads to physical dependence, a state in which the body has adapted to the presence of the drug. If a dependent user reduces or stops use of the drug abruptly, he or she may experience severe symptoms of withdrawal. These symptoms—which can begin as early as a few hours after the last drug administration—can include restlessness, muscle and bone pain, insomnia, diarrhea and vomiting, cold flashes with goose bumps ("cold turkey"), and kicking movements ("kicking the habit"). Users also experience severe craving for the drug during withdrawal, which can precipitate continued abuse and/or relapse.

Major withdrawal symptoms peak between 48 and 72 hours after the last dose of the drug and typically subside after about 1 week. Some individuals, however, may show persistent withdrawal symptoms for months. Although heroin withdrawal is considered less dangerous than alcohol or barbiturate withdrawal, sudden withdrawal by heavily dependent users who are in poor health is occasionally fatal. In addition, heroin craving can persist years after drug cessation, particularly upon exposure to triggers such as stress or people, places, and things associated with drug use.

Heroin abuse during pregnancy, together with related factors like poor nutrition and inadequate prenatal care, has been associated with adverse consequences including low birthweight, an important risk factor for later developmental delay. If the mother is regularly abusing the drug, the infant may be born physically dependent on heroin and could suffer from serious medical complications requiring hospitalization.

Marijuana

Marijuana is the most commonly abused illicit drug in the United States. It is a dry, shredded green and brown mix of flowers, stems, seeds, and leaves derived from the hemp plant *Cannabis sativa*. The main active chemical in marijuana is delta-9-tetrahydrocannabinol, or THC for short.

How is Marijuana Abused?

Marijuana is usually smoked as a cigarette (joint) or in a pipe. It is also smoked in blunts, which are cigars that have been emptied of tobacco and refilled with a mixture of marijuana and tobacco. This mode of delivery combines marijuana's active ingredients with nicotine and other harmful chemicals. Marijuana can also be mixed in food or brewed as a tea. As a more concentrated, resinous form, it is called hashish; and as a sticky black liquid, hash oil. Marijuana smoke has a pungent and distinctive, usually sweet-and-sour odor.

How Does Marijuana Affect the Brain?

Scientists have learned a great deal about how THC acts in the brain to produce its many effects. When someone smokes marijuana, THC rapidly passes from the lungs into the bloodstream, which carries the chemical to the brain and other organs throughout the body.

THC acts upon specific sites in the brain, called cannabinoid receptors, kicking off a series of cellular reactions that ultimately lead to the “high” that users experience when they smoke marijuana. Some brain areas have many cannabinoid receptors; others have few or none. The highest density of cannabinoid receptors are found in parts of the brain that influence pleasure, memory, thinking, concentrating, sensory and time perception, and coordinated movement.

Not surprisingly, marijuana intoxication can cause distorted perceptions, impaired coordination, difficulty with thinking and problem solving, and problems with learning and memory. Research has shown that, in chronic users, marijuana’s adverse impact on learning and memory can last for days or weeks after the acute effects of the drug wear off. As a result, someone who smokes marijuana every day may be functioning at a suboptimal intellectual level all of the time.

Research into the effects of long-term cannabis use on the structure of the brain has yielded inconsistent results. It may be that the effects are too subtle for reliable detection by current techniques. A similar challenge arises in studies of the effects of chronic marijuana use on brain function. Brain imaging studies in chronic users tend to show some consistent alterations, but their connection to impaired cognitive functioning is far from clear. This uncertainty may stem from confounding factors such as other drug use, residual drug effects, or withdrawal symptoms in long-term chronic users.

What Other Adverse Effect Does Marijuana Have on Health?

Effects on the Heart

Marijuana increases heart rate by 20-100 percent shortly after smoking; this effect can last up to 3 hours. In one study, it was estimated that marijuana users have a 4.8-fold increase in the risk of heart attack in the first hour after smoking the drug. This may be due to increased heart rate as well as the effects of marijuana on heart rhythms, causing palpitations and arrhythmias. This risk may be greater in aging populations or in those with cardiac vulnerabilities.

Effects on the Lungs

Numerous studies have shown marijuana smoke to contain carcinogens and to be an irritant to the lungs. In fact, marijuana smoke contains 50–70 percent more carcinogenic hydrocarbons than tobacco smoke. Marijuana users usually inhale more deeply and hold their breath longer than tobacco smokers do, which further increase the lungs’ exposure to carcinogenic smoke. Marijuana smokers show dysregulated growth of epithelial cells in their lung tissue, which could lead to cancer; however, a recent case-controlled study found no positive associations between marijuana use and lung, upper respiratory, or upper digestive tract cancers. Thus, the link between marijuana smoking and these cancers remains unsubstantiated at this time.

Nonetheless, marijuana smokers can have many of the same respiratory problems as tobacco smokers, such as daily cough and phlegm production, more frequent acute chest illness, and a heightened risk of lung infections. A study of 450 individuals found that people who smoke marijuana frequently but do not smoke tobacco have more health problems and miss more days of work than nonsmokers. Many of the extra sick days among the marijuana smokers in the study were for respiratory illnesses.

How Widespread is Marijuana Abuse?

According to the National Survey on Drug Use and Health, in 2009, 16.7 million Americans aged 12 or older used marijuana at least once in the month prior to being surveyed, an increase over the rates reported in all years between 2002 and 2008. There was also a significant increase among youth aged 12–17, with current use up from 6.7 percent in 2008 to 7.3 percent in 2009, although this rate is lower than what was reported in 2002 (8.2 percent). Past-month use also increased among those 18–25, from 16.5 percent in 2008 to 18.1 percent in 2009.

Is Marijuana Medicine?

The potential medicinal properties of marijuana have been the subject of substantive research and heated debate. Scientists have confirmed that the cannabis plant contains active ingredients with therapeutic potential for relieving pain, controlling nausea, stimulating appetite, and decreasing ocular pressure. Cannabinoid-based medications include synthetic compounds, such as dronabinol (Marinol®) and nabilone (Cesamet®), which are FDA approved, and a new, chemically pure mixture of plant-derived THC and cannabidiol called Sativex®, formulated as a mouth spray and approved in Canada and parts of Europe for the relief of cancer-associated pain and spasticity and neuropathic pain in multiple sclerosis.

Scientists continue to investigate the medicinal properties of THC and other cannabinoids to better evaluate and harness their ability to help patients suffering from a broad range of conditions, while avoiding the adverse effects of smoked marijuana.

Sources

Source: Drug Abuse, National Institute on Drug Abuse via Medline Plus, http://www.nlm.nih.gov/medlineplus/drugabuse.html

Club Drugs: Club Drugs, NLM, NIH, http://www.nlm.nih.gov/medlineplus/clubdrugs.html

What Type of Drugs are Club Drugs?: Ketamine, www.drugabuse.gov/publications/infofacts/club-drugs-ghb-ketamine-rohypnol

Methamphetamine: Methaphetamine, NIH: National Institute on Drug Abuse, http://www.nlm.nih.gov/medlineplus/methamphetamine.html

What Type of Drug is Methamphetamine?: Methamphetamine, www.drugabuse.gov/publications/infofacts/methamphetamine

Anabolic Steroids: Anabolic Steroids, www.drugabuse.gov/publications/infofacts/steroids-anabolic-androgenic

Cocaine: Cocaine, NIH: National Institute on Drug Abuse via MedlinePlus, http://www.nlm.nih.gov/medlineplus/cocaine.html

What Type of Drug is Cocaine?: Cocaine **,** www.drugabuse.gov/publications/infofacts/cocaine

Heroin: Heroin, NLM, NIH**,**http://www.nlm.nih.gov/medlineplus/heroin.html

Marijuana: Marijuana**,**http://www.drugabuse.gov/infofacts/marijuana.html

How Widespread is Marijuana Abuse?: National Survey on Drug Use and Health (NSDUH)

? Exercise 6.1.1

1. What is the difference between a legal and an illegal drug?
2. How can drugs affect the central nervous system?
3. Name one reason people might misuse drugs.

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6.2: Alcohol

Alcohol Abuse

If you are like many Americans, you drink alcohol at least occasionally. For many people, moderate drinking is probably safe. It may even have health benefits, including reducing your risk of certain heart problems. Moderate drinking is one drink a day for women or anyone over 65, and two drinks a day for men under 65.

Some people should not drink at all, including alcoholics, children, pregnant women, people on certain medicines and people with some medical conditions.

Anything more than moderate drinking can be risky. Binge drinking—drinking five or more drinks at one time—can damage your health and increase your risk for accidents, injuries and assault. Years of heavy drinking can lead to liver disease, heart disease, cancer and pancreatitis. It can also cause problems at home, at work and with friends.

? Exercise 6.2.1

1. How many drinks for males within a short period of time is considered binge drinking? How many drinks for females within a short period of time is considered binge drinking?
2. True or false: Binge drinking is a risk factor for sexual assault, especially among young women in college settings. Each year, about 1 in 20 college women are sexually assaulted. Binge drinking also increases the chances of car crashes, violence against others, unintended pregnancies, and the spread of HIV and sexually transmitted diseases.
3. What is the most commonly used and abused substance among youth in the United States, more than tobacco and illicit drugs?
4. True or false: Teens and young adults who do not get enough sleep are at risk for automobile crashes, poor grades and performance in school, depressed moods, and problems with peer and adult relationships.

Answer

1. males—5 or more within a short period of time, females—4 or more within a short period of time;
2. true
3. Alcohol
4. true

Beyond Hangovers

A brightly colored cosmopolitan is the drink of choice for the glamorous characters in Sex and the City. James Bond depends on his famous martini—shaken, not stirred—to unwind with after confounding a villain. And what wedding concludes without a champagne toast?

Alcohol is part of our culture—it helps us celebrate and socialize, and it enhances our religious ceremonies. But drinking too much—on a single occasion or over time—can have serious consequences for our health. Most Americans recognize that drinking too much can lead to accidents and dependence. But that's only part of the story. In addition to these serious problems, alcohol abuse can damage organs, weaken the immune system, and contribute to cancers. Plus, much like smoking, alcohol affects different people differently. Genes, environment, and even diet can play a role in whether you develop an alcohol-related disease.

On the flip side, some people actually may benefit from drinking alcohol in small quantities. Sound complicated? It sure can be. To stay healthy, and to decide what role alcohol should play in your life, you need accurate, up-to-date information. This brochure is designed to offer you guidance based on the latest research on alcohol's effect on your health.

Moderate and Binge Drinking

Moderate or "low-risk" drinking

Research shows that people who drink moderately may be less likely to experience an alcohol use disorder (AUD). These drinking levels, which differ for men and women, are:

For men:

- No more than 4 drinks on any single day AND no more than 14 drinks per week

For women:

- No more than 3 drinks on any single day AND no more than 7 drinks per week

To stay low risk for AUDs, you must keep within both the single-day and weekly limits.

Even within these limits, you can have problems if you drink too quickly or have other health issues. To keep your risk for problems low, make sure you:

- Drink slowly
- Eat enough while drinking

Certain people should avoid alcohol completely, including those who:

- Plan to drive a vehicle or operate machinery
- Take medications that interact with alcohol
- Have a medical condition that alcohol can aggravate
- Are pregnant or trying to become pregnant

Heavy or “at-risk” drinking

For healthy adults in general, heavy drinking means consuming more than the single-day or the weekly amounts listed above. About 1 in 4 people who drink above these levels already has alcohol dependence or alcohol abuse problems.

Binge drinking

Binge drinking means drinking so much within about 2 hours that blood alcohol concentration (BAC) levels reach 0.08g/dL. For women, this usually occurs after about 4 drinks, and for men, after about 5.

Drinking this way can pose health and safety risks, including car crashes and injuries. Over the long term, binge drinking can damage the liver and other organs.

Learning Activity

Find out about alcohol content in drinks, calories in alcoholic drinks, and the cost of drinking. Use the Cocktail Content Calculator to find out how strong your mixed drink or cocktail is.

1. Do you know how many “standard drinks” are in an alcoholic beverage? Use the Drink Size Calculator to find out.
2. Find out how many calories are in your alcoholic beverage of choice using the Alcohol Calorie Calculator.
3. How much do you spend on alcohol. Use the Alcohol Spending Calculator to find out.

A Little Goes a Long Way: Know the Amounts

Knowing how much alcohol constitutes a “standard” drink can help you determine how much you are drinking and understand the risks. One standard drink contains about 0.6 fluid ounces or 14 grams of pure alcohol. In more familiar terms, the following amounts constitute one standard drink:

- 12 fluid ounces of beer (about 5% alcohol)
- 8 to 9 fluid ounces of malt liquor (about 7% alcohol)
- 5 fluid ounces of table wine (about 12% alcohol)
- 1.5 fluid ounces of hard liquor (about 40% alcohol)

You’re chatting with friends at a party and a waitress comes around with glasses of champagne. You drink one, then another, maybe even a few more. Before you realize it, you are laughing more loudly than usual and swaying as you walk. By the end of the evening, you are too slow to move out of the way of a waiter with a dessert tray and have trouble speaking clearly. The next morning, you wake up feeling dizzy and your head hurts. You may have a hard time remembering everything you did the night before.

These reactions illustrate how quickly and dramatically alcohol affects the brain. The brain is an intricate maze of connections that keeps our physical and psychological processes running smoothly. Disruption of any of these connections can affect how the brain works. Alcohol also can have longer-lasting consequences for the brain—changing the way it looks and works and resulting in a range of problems.

Most people do not realize how extensively alcohol can affect the brain. But recognizing these potential consequences will help you make better decisions about what amount of alcohol is appropriate for you.

What happens inside the brain?

The brain's structure is complex. It includes multiple systems that interact to support all of your body's functions—from thinking to breathing to moving.

These multiple brain systems communicate with each other through about a trillion tiny nerve cells called neurons. Neurons in the brain translate information into electrical and chemical signals the brain can understand. They also send messages from the brain to the rest of the body.

Chemicals called *neurotransmitters* carry messages between the neurons. Neurotransmitters can be very powerful. Depending on the type and the amount of neurotransmitter, these chemicals can either intensify or minimize your body's responses, your feelings, and your mood. The brain works to balance the neurotransmitters that speed things up with the ones that slow things down to keep your body operating at the right pace.

Alcohol can slow the pace of communication between neurotransmitters in the brain.

Fetal Alcohol Syndrome

Alcohol can affect the brain at any stage of development—even before birth. Fetal alcohol spectrum disorders are the full range of physical, learning, and behavioral problems, and other birth defects that result from prenatal alcohol exposure. The most serious of these disorders, *fetal alcohol syndrome* (FAS), is characterized by abnormal facial features and is usually associated with severe reductions in brain function and overall growth. FAS is the leading preventable birth defect associated with mental and behavioral impairment in the United States today.

The brains of children with FAS are smaller than normal and contain fewer cells, including neurons. These deficiencies result in life-long learning and behavioral problems. Current research is investigating whether the brain function of children and adults with FAS can be improved with complex rehabilitative training, dietary supplements, or medications.

Alcohol and Heart Disease

Americans know how prevalent heart disease is—about 1 in 12 of us suffer from it. What we don't always recognize are the connections heart disease shares with alcohol. On the one hand, researchers have known for centuries that excessive alcohol consumption can damage the heart. Drinking a lot over a long period of time or drinking too much on a single occasion can put your heart—and your life—at risk. On the other hand, researchers now understand that drinking moderate amounts of alcohol can protect the hearts of some people from the risks of coronary artery disease.

Deciding how much, if any, alcohol is right for you can be complicated. To make the best decision for yourself, you need to know the facts and then consult your physician.

Cancer Risk

Genetics, environment, and lifestyle habits can all heighten your risk of getting cancer. We can't do anything to change our genes, and we often can't do much to change our environment. But lifestyle habits are a different story.

Drinking too much alcohol is one lifestyle habit that can increase your risk of developing certain cancers. This does not mean that anyone who drinks too much will develop cancer. But numerous studies do show the more you drink, the more you increase your chances of developing certain types of cancer.

For example, a group of Italy-based scientists reviewed more than 200 studies examining alcohol's impact on cancer risk. The collective results of these studies clearly demonstrate that the more you drink, the higher your risk for developing a variety of cancers. The National Cancer Institute identifies alcohol as a risk factor for the following types of cancer:

- Mouth
- Esophagus
- Pharynx
- Larynx
- Liver
- Breast

At least 7 out of 10 people with mouth cancer drink heavily. Drinking five or more drinks per day can also increase your risk of developing other types of cancers, including colon or rectal cancer. In fact, summary estimates from the recent World Cancer Research Fund report indicate that women who drink five standard alcohol drinks each day have about 1.2 times the risk of developing colon or rectal cancer than women who do not drink at all.

People who drink are also more likely to smoke, and the combination increases the risk significantly. Smoking alone is a known risk factor for some cancers. But smoking and drinking together intensifies the cancer-causing properties of each substance. The overall effect poses an even greater risk.

The risk of throat and mouth cancers is especially high because alcohol and tobacco both come in direct contact with those areas. Overall, people who drink and smoke are 15 times more likely to develop cancers of the mouth and throat than nondrinkers and nonsmokers. In addition, recent studies estimate that alcohol and tobacco together are responsible for:

- 80 percent of *throat and mouth cancer* in men
- 65 percent of throat and mouth cancer in women
- 80 percent of *esophageal squamous cell carcinoma*, a type of esophagus cancer
- 25 to 30 percent of all liver cancers

Know the Benefits

Research shows that healthy people who drink moderate amounts of alcohol may have a lower risk of developing coronary heart disease than nondrinkers. Moderate drinking is usually defined as no more than two drinks in a given day for men and one drink per day for women who are not pregnant or trying to conceive.

A variety of factors, including diet, genetics, high blood pressure, and age, can cause fat to build up in your arteries, resulting in coronary heart disease. An excess of fat narrows the coronary arteries, which are the blood vessels that supply blood directly to the heart. Clogged arteries reduce blood supply to the heart muscle, and make it easier for blood clots to form. Blood clots can lead to both heart attacks and strokes.

According to recent studies, drinking moderately can protect your heart from these conditions. Moderate drinking helps inhibit and reduce the build-up of fat in the arteries. It can raise the levels of HDL—or “good” cholesterol—in the blood, which wards off heart disease. It can help guard against heart attack and stroke by preventing blood clots from forming and by dissolving blood clots that do develop. Drinking moderately also may help keep blood pressure levels in check.

These benefits may not apply to people with existing medical conditions, or who regularly take certain medications. In addition, researchers discourage people from beginning to drink just for the health benefits. Rather, you can use this research to help you spark a conversation with your medical professional about the best path for you.

? Learning Activity

Find out what it takes to cut down or quit drinking alcohol at Rethinking Drinking, Alcohol and Your Health.

- What are your reasons for and against making a change?
- What are small changes that can make a big difference?

See where you stand:

- Check your drinking pattern.
- See if you have signs of a problem.
- Track what you drink with drinking tracker cards.

Decide whether & how to change:

- Weigh your reasons for and against making a change
- Plan a change.
- Choose tips for cutting back or quitting.

Stay in control:

- Handle urges to drink.
- Build skills in refusing drinks.

Sources

Alcohol Abuse: Alcohol Abuse, NIH: National Institute on Alcohol Abuse and Alcoholism via Medline, http://www.nlm.nih.gov/medlineplus/alcohol.html

Quick Quiz: College Health, CDC, http://www.cdc.gov/Features/CollegeHealth/

Beyond Hangovers: Beyond Hangovers, NIAAA, NIH, pubs.niaaa.nih.gov/publications/Hangovers/beyondHangovers.htm

Moderate and Binge Drinking: Moderate & Binge Drinking, National Institute on Alcohol Abuse and Alcoholism, NIAAA, NIH

A Little Goes a Long Way: Know the Amounts: Beyond Hangovers, NIAAA, NIH, pubs.niaaa.nih.gov/publications/Hangovers/beyondHangovers.htm

? Exercise 6.2.1

1. What is one short-term effect of alcohol consumption on the body?
2. How does chronic alcohol use impact liver health?
3. Why is it dangerous to drink alcohol while taking certain medications?

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6.3: Tobacco

The 30th tobacco-related Surgeon General's report issued since 1964 describes in detail the specific pathways by which tobacco smoke damages the human body. The scientific evidence supports the following conclusions:

There is no safe level of exposure to tobacco smoke.

- Any exposure to tobacco smoke—even an occasional cigarette or exposure to secondhand smoke—is harmful.
- You don't have to be a heavy smoker or a long-time smoker to get a smoking-related disease or have a heart attack or asthma attack that is triggered by tobacco smoke.
- Low levels of smoke exposure, including exposures to secondhand tobacco smoke, lead to a rapid and sharp increase in dysfunction and inflammation of the lining of the blood vessels, which are implicated in heart attacks and stroke.
- Cigarette smoke contains more than 7,000 chemicals and compounds. Hundreds are toxic and at least 69 cause cancer. Tobacco smoke itself is a known human carcinogen.
- Chemicals in tobacco smoke interfere with the functioning of fallopian tubes, increasing risk for adverse pregnancy outcomes such as ectopic pregnancy, miscarriage, and low birth weight. They also damage the DNA in sperm which might reduce fertility and harm fetal development.

Damage from tobacco smoke is immediate.

- The chemicals in tobacco smoke reach your lungs quickly every time you inhale. Your blood then carries the toxicants to every organ in your body.
- The chemicals and toxicants in tobacco smoke damage DNA, which can lead to cancer. Nearly one-third of all cancer deaths every year are directly linked to smoking. Smoking causes about 85% of lung cancers in the U.S.
- Exposure to tobacco smoke quickly damages blood vessels throughout the body and makes blood more likely to clot. This damage can cause heart attacks, strokes, and even sudden death.
- The chemicals in tobacco smoke inflame the delicate lining of the lungs and can cause permanent damage that reduces the ability of the lungs to exchange air efficiently and leads to chronic obstructive pulmonary disease (COPD), which includes emphysema and chronic bronchitis.

Smoking longer means more damage.

- Both the risk and the severity of many diseases caused by smoking are directly related to how long the smoker has smoked and the number of cigarettes smoked per day.
- Chemicals in tobacco smoke cause inflammation and cell damage, and can weaken the immune system. The body makes white blood cells to respond to injuries, infections, and cancers. White blood cell counts stay high while smoking continues, meaning the body is constantly fighting against the damage caused by smoking which can lead to disease in almost any part of the body.
- Smoking can cause cancer and weaken your body's ability to fight cancer. With any cancer—even those not related to tobacco use—smoking can decrease the benefits of chemotherapy and other cancer treatments. Exposure to tobacco smoke can help tumors grow.
- The chemicals in tobacco smoke complicate the regulation of blood sugar levels, exacerbating the health issues resulting from diabetes. Smokers with diabetes have a higher risk of heart and kidney disease, amputation, eye disease causing blindness, nerve damage and poor circulation.

Cigarettes are designed for addiction.

- The design and contents of tobacco products make them more attractive and addictive than ever before. Cigarettes today deliver nicotine more quickly from the lungs to the heart and brain.
- The powerful addicting elements of tobacco products affect multiple types of nicotine receptors in the brain.
- Evidence suggests that psychosocial, biologic, and genetic factors may also play a role in nicotine addiction.

There is no safe cigarette.

- The evidence indicates that changing cigarette designs over the last five decades, including filtered, low-tar, and "light" variations, have NOT reduced overall disease risk among smokers and may have hindered prevention and cessation efforts.

- The overall health of the public could be harmed if the introduction of novel tobacco products encourages tobacco use among people who would otherwise be unlikely to use a tobacco product or delays cessation among persons who would otherwise quit using tobacco altogether.

The only proven strategy for reducing the risk of tobacco-related disease and death is to never smoke, and if you do smoke to quit.

- Quitting at any age and at any time is beneficial. It's never too late to quit, but the sooner the better.
- Quitting gives your body a chance to heal the damage caused by smoking.
- When smokers quit, the risk for a heart attack drops sharply after just 1 year; stroke risk can fall to about the same as a nonsmoker's after 2–5 years; risks for cancer of the mouth, throat, esophagus, and bladder are cut in half after 5 years; and the risk for dying of lung cancer drops by half after 10 years.
- Smokers often make several attempts before they are able to quit, but new strategies for cessation, including nicotine replacement and non-nicotine medications, can make it easier.

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? Learning Activity

Follow two people as they attempt to lead healthier lives, and learn how the choices you make depend on what choices are available.

- If you were told you had to quit smoking and lose 20 pounds, how easy would it be for you?

Quitting

The only proven strategy for reducing the risk of tobacco-related disease and death is to never smoke, and if you do smoke to quit.

Quitting at any age and at any time is beneficial. It's never too late to quit, but the sooner the better. Quitting gives your body a chance to heal the damage caused by smoking. When smokers quit, the risk for a heart attack drops sharply after just 1 year; stroke risk can fall to about the same as a nonsmoker's after 2-5 years; risks for cancer of the mouth, throat, esophagus, and bladder are cut in half after 5 years; and the risk for dying of lung cancer drops by half after 10 years. Smokers often make several attempts before they are able to quit, but new strategies for cessation, including nicotine replacement and non-nicotine medications, can make it easier.

Tobacco smoke is a toxic mix of more than 7,000 chemicals. Many are poisons. When these chemicals get deep into your body's tissues, they cause damage. Your body must fight to heal the damage each time you smoke. Over time, the damage can lead to disease.

The chemicals in tobacco smoke reach your lungs quickly when you inhale. What this new report shows is that *these same poisonous chemicals reach every organ in your body*. They go quickly from your lungs into your blood. Then the blood flows through your arteries. It carries the chemicals to tissues in all parts of your body. Your lungs, blood vessels, and other delicate tissues become inflamed and damaged when you smoke.

Smoking Keeps Your Body under Attack

If you spilled drain cleaner on your skin, it would hurt and become inflamed. If you did this many times a day, your skin would not have a chance to heal. It would stay red, irritated, and inflamed. The organs in your body also have a lining of cells similar to skin. Chemicals in tobacco smoke cause inflammation and damage to these cells. When you keep smoking, the damage cannot heal.

Smoking makes your immune system work overtime. Your body makes white blood cells to respond to injuries, infections, and even cancers. Blood tests show that your white blood cell numbers stay high when you smoke. High numbers mean that your body is constantly fighting against the damage caused by tobacco smoke. This constant stress disrupts how your body works. New research shows that stress can lead to disease in almost any part of your body.

Damage is Immediate

The poisons in smoke pose a danger right away. Sudden blood clots, heart attacks, and strokes can be triggered by tobacco smoke. Poisons in tobacco smoke disrupt the way your body heals itself. Even smoking a cigarette now and then is enough to hurt you. Sitting in a smoky bar raises your odds of a heart attack.

The more years you smoke, the more you hurt your body. Scientists now know that your disease risk surges even higher after you have smoked for about 20 years. But research shows that if you quit by age 30, your health could become almost as good as a nonsmoker's. At any age, the sooner you quit, the sooner your body can begin to heal.

Nicotine is Powerfully Addictive

Addiction to nicotine changes the chemical balance in your brain. Addiction keeps people smoking even when they want to quit. Breaking addiction is harder for some people than others. Many people need more than one try in order to quit.

Scientists now know more about why the brain craves nicotine. Like heroin or cocaine, nicotine changes the way your brain works and causes you to crave more and more nicotine. These powerful cravings make it hard for you to think about anything else. Smoking can cause both physical and mental addiction.

Cigarettes are Designed for Addiction

Cigarette makers have long known that nicotine addiction helps sell their products. Cigarettes today deliver more nicotine and deliver it quicker than ever before. The additives and chemicals that tobacco companies put in cigarettes may have helped make them.

You might have thought that "filtered," "low-tar," or "light" cigarettes were less dangerous than others. But research shows that these cigarettes are every bit as addictive and are no safer than other cigarettes. Misleading labels are no longer allowed.

Many teens who try cigarettes don't know how easy it is to become addicted. Nicotine addiction is so powerful that every day about 1,000 teens become daily smokers. Why is this important? Because most current smokers became addicted as teenagers.

You Can Beat Addiction to Tobacco

Smokers who quit go through withdrawal. The first days are the most uncomfortable. The physical symptoms of nicotine addiction end about 3 weeks after you quit smoking. But you may still have an urge to smoke when you wake up, drink coffee, or are out with friends. It takes longer to break these patterns. But you can beat it.

? Learning Activity

Youth are being targeted by the big tobacco industry through Hollywood movies. This video was created by the Sudbury & District Health Unit's Youth Program Advisors to raise public awareness of this issue.



- What movies and TV shows do you think glorify smoking?

Myths about Smoking and Cigarettes

Smoking is just a choice.

The first time? Yes. After just a few cigarettes? No. Addiction to nicotine can happen quickly. It changes the chemical balance in your brain. Smoking may seem like it's just a choice or a habit. In fact, most people who use tobacco are addicted. Breaking nicotine addiction is harder for some people than others. Quitting can take several tries. But don't give up. If you need help to quit, ask your doctor about nicotine replacement, medicines, or coaching.

Filters make cigarettes safer.

Filters do not protect you. They are designed to make smoke particles smaller. That makes nicotine easier to absorb. This increases addiction. Cigarettes have been engineered to speed up nicotine's path to your brain. Their design feeds addiction. Light or low-tar cigarettes may sound less dangerous. They aren't. These misleading labels are no longer allowed. No cigarette is safe. Tobacco smoke contains more than 7,000 chemicals. At least 250 are toxic.

An occasional cigarette is no big deal.

Smoking doesn't just cause diseases for heavy smokers or longtime smokers. The 2010 Surgeon General's Report shows how breathing tobacco smoke can cause immediate harm. Tobacco smoke can trigger sudden heart attacks and death, even in nonsmokers. Each cigarette you smoke hurts your lungs, your blood vessels, and cells throughout your body. Smoking a few cigarettes a week can cause a heart attack. Cutting back is not enough to protect you. You have to quit entirely.

It's too late to quit—the damage is already done.

It's true that the longer you use tobacco, the more you hurt your body. But at any age, the sooner you quit, the sooner your health can improve. The 2010 Surgeon General's Report shows how using tobacco causes disease almost everywhere in your body. Within 20 minutes after quitting, your body starts to heal. After 2 to 5 years, your risk for stroke is similar to that of a nonsmoker. In 10 years, your lung cancer risk is cut in half.

Secondhand smoke may bother people, but it isn't dangerous.

Tens of thousands of nonsmokers die every year from breathing others' secondhand smoke. Breathing the chemicals in tobacco smoke changes your blood's chemistry almost immediately. Deadly clots can form and block arteries to your heart or brain. When you smoke at work, home, or at a restaurant, everyone there breathes poisons. If you smoke in your car, rolling down a window does not protect your passengers. It is not healthy to breathe any amount of tobacco smoke.

The little bit of smoke that my kids get doesn't hurt them.

Don't smoke or let others smoke around your children. They can get bronchitis, pneumonia, and ear infections from smoke. Even if you only smoke by an open window, some of the smoke stays in your house and poisons the air your children breathe. Children with asthma can have a serious, even deadly, asthma attack from breathing secondhand smoke. The best way to protect children is to quit smoking. If you or someone else in your household are not ready to quit, be sure to make your home and car 100% smoke-free.

Sources

Source: A Report of the Surgeon General: How Tobacco Smoke Causes Disease, The Biology and Behavioral Basis for Smoking-Attributable Disease Fact Sheet 2010, http://www.surgeongeneral.gov/library/tobaccosmoke/factsheet.htmlMore Information

Myths about Smoking and Cigarettes: Myths about Smoking and Cigarettes, CDC, http://www.cdc.gov/tobacco/data_statistics/sgr/2010/myths/pdfs/myths.pdf

? Exercise 6.3.1

1. What is one harmful chemical found in tobacco smoke?
2. How does smoking affect the respiratory system?
3. Name one health risk associated with secondhand smoke.

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6.4: Misuse of Prescription Drugs

Prescription Drugs

Most people take medicines only for the reasons their doctors prescribe them. But an estimated 20 percent of people in the United States have used prescription drugs for nonmedical reasons. This is prescription drug abuse. It is a serious and growing problem.

Abusing some prescription drugs can lead to addiction. You can develop an addiction to:

- Narcotic painkillers
- Sedatives and tranquilizers
- Stimulants

Experts don't know exactly why this type of drug abuse is increasing. The availability of drugs is probably one reason. Doctors are prescribing more drugs for more health problems than ever before. Online pharmacies make it easy to get prescription drugs without a prescription, even for youngsters.

? Learning Activity

Pillbox was developed to aid in the identification of unknown solid dosage pharmaceuticals. The system combines high-resolution images of tablets and capsules with appearance information (imprint, shape, color, etc.) to enable users to visually search for and identify an unknown solid dosage pharmaceutical.

This system is designed for use by emergency physicians, first responders, other health care providers, Poison Control Center staff, and concerned citizens.

The system enables users to identify solid dosage forms based on physical criteria: imprint (characters or number printed on a medication), shape, color, size, and scoring. Users are shown thumbnail images of possible matches. These images are continually updated as the user enters additional information.

- Visit the Pillbox to check the pills in your family medicine cabinet.
- Find any surprises?

? Learning Activity 4.2: Clean out your medicine cabinet.

You may want to consider getting rid of expired medications. For tips, read Spring Cleaning: A Dose of Your Own Medicine

Commonly Abused Prescription Drugs

Medications can be effective when they are used properly, but some can be addictive and dangerous when abused. Some prescribed medications that—when used in ways or by people other than prescribed—have the potential for adverse medical consequences, including addiction.

In 2010, approximately 16 million Americans reported using a prescription drug for nonmedical reasons in the past year; 7 million in the past month.

After marijuana, prescription and over-the-counter medications account for most of the commonly abused drugs.

What types of prescription drugs are abused?

Three types of drugs are abused most often:

- Opioids—prescribed for pain relief
- CNS depressants—barbiturates and benzodiazepines prescribed for anxiety or sleep problems (often referred to as sedatives or tranquilizers)
- Stimulants—prescribed for attention-deficit hyperactivity disorder (ADHD), the sleep disorder narcolepsy, or obesity.

How can you help prevent prescription drug abuse?

- Ask your doctor or pharmacist about your medication, especially if you are unsure about its effects.
- Keep your doctor informed about all medications you are taking, including over-the-counter medications.
- Read the information your pharmacist provides before starting to take medications.
- Take your medication(s) as prescribed.
- Keep all prescription medications secured at all times and properly dispose of any unused medications.

Prescription Drug Advertising

Your healthcare provider is the best source of information about the right medicines for you.

The Food and Drug Administration (FDA) protects public health by assuring the safety, effectiveness, and security of a wide range of products, including human prescription drugs. We also advance public health by helping people get the accurate, science-based information they need to use medicines appropriately and improve their health. Prescription drug advertisements can provide useful information for consumers to work with their health care providers to make wise decisions about treatment.

FDA Authority Over Advertising

The FDA serves the public health and welfare in many ways. One way is overseeing the approval and marketing of prescription drugs. It's authority is based on a number of federal laws, including the Federal Food, Drug, and Cosmetic Act. Among other areas, this law specifically addresses prescription drug advertising. This law requires that advertisements for prescription drugs be accurate and not misleading.

Direct-to-consumer (DTC) advertising is a relatively new area of prescription drug promotion. No federal law has ever banned DTC advertising. Until the mid-1980s, drug companies gave information about prescription drugs only to doctors and pharmacists. When these professionals thought it appropriate, they gave that information to their patients. However, during the 1980s, some drug companies started to give the general public more direct access to this information through DTC ads.

The law requires that product claim ads give a "fair balance" of information about drug risks as compared with information about drug benefits. This means that the content and presentation of a drug's most important risks must be reasonably similar to the content and presentation of its benefits.

This does not mean that equal space must be given to risks and benefits in print ads, or equal time to risks and benefits in broadcast ads. The amount of time or space needed to present risk information will depend on the drug's risks and the way that both the benefits and risks are presented.

Think about the following questions when you see an ad for a prescription drug. Also, think about asking these questions when you talk to your doctor or pharmacist about a drug.

- What condition does this drug treat?
- Why do I think that I might have this condition?
- If I have the condition, am I part of the population the drug is approved to treat?
- Should I take this drug if I have a certain condition?
- Should I take this drug if I am taking certain other drugs?
- Which of the drug's possible side effects am I concerned about?
- How will this drug affect other drugs I am taking?
- Will foods, beverages (alcoholic or non-alcoholic), vitamins, or other supplements affect how this drug works?
- Are there other drugs that treat my condition?
- Is there a less costly drug I could use to treat my condition?
- What else can I do to help deal with my condition? For example, should I exercise or change my diet?
- Do other drugs for my condition have different side effects?
- How can I learn more about this condition and this drug?

Harmful Interactions: Mixing Alcohol with Medicines

You've probably seen this warning on medicines you've taken. The danger is real. Mixing alcohol with certain medications can cause nausea and vomiting, headaches, drowsiness, fainting, or loss of coordination.

It also can put you at risk for internal bleeding, heart problems, and difficulties in breathing. In addition to these dangers, alcohol can make a medication less effective or even useless, or it may make the medication harmful or toxic to your body.

Some medicines that you might never have suspected can react with alcohol, including many medications which can be purchased "over-the-counter"—that is, without a prescription. Even some herbal remedies can have harmful effects when combined with alcohol.

See the NIH publication Harmful Interactions: Mixing Alcohol with Medicines for a list of medications that can cause harm when taken with alcohol and description of the effects that can result. The list gives the brand name by which each medicine is commonly known (for example, Benadryl®) and its generic name or active ingredient (in Benadryl®, this is diphenhydramine). **The list presented here does not include all the medicines that may interact harmfully with alcohol. Most important, the list does not include all the ingredients in every medication.**

Medications are safe and effective when used appropriately. Your pharmacist or other health care provider can help you determine which medications interact harmfully with alcohol.

Did You Know . . .

Mixing alcohol and medicines can be harmful. Alcohol, like some medicines, can make you sleepy, drowsy, or lightheaded. Drinking alcohol while taking medicines can intensify these effects. You may have trouble concentrating or performing mechanical skills. Small amounts of alcohol can make it dangerous to drive, and when you mix alcohol with certain medicines you put yourself at even greater risk. Combining alcohol with some medicines can lead to falls and serious injuries, especially among older people.

Medicines may have many ingredients

Some medications—including many popular painkillers and cough, cold, and allergy remedies—contain more than one ingredient that can react with alcohol. Read the label on the medication bottle to find out exactly what ingredients a medicine contains. Ask your pharmacist if you have any questions about how alcohol might interact with a drug you are taking.

Some medicines contain alcohol

Certain medicines contain up to 10 percent alcohol. Cough syrup and laxatives may have some of the highest alcohol concentrations.

Alcohol affects women differently

Women, in general, have a higher risk for problems than men. When a woman drinks, the alcohol in her bloodstream typically reaches a higher level than a man's even if both are drinking the same amount. This is because women's bodies generally have less water than men's bodies. Because alcohol mixes with body water, a given amount of alcohol is more concentrated in a woman's body than in a man's. As a result, women are more susceptible to alcohol-related damage to organs such as the liver.

Older people face greater risk

Older people are at particularly high risk for harmful alcohol– medication interactions. Aging slows the body's ability to break down alcohol, so alcohol remains in a person's system longer. Older people also are more likely to take a medication that interacts with alcohol—in fact, they often need to take more than one of these medications.

Timing is important

Alcohol and medicines can interact harmfully even if they are not taken at the same time.

? Remember

Mixing alcohol and medicines puts you at risk for dangerous reactions. Protect yourself by avoiding alcohol if you are taking a medication and don't know its effect. To learn more about a medicine and whether it will interact with alcohol, talk to your pharmacist or other health care provider.

Sources

Misuse of Prescription Drugs: Misuse of Prescription Drugs, NLM, NIH, http://www.nlm.nih.gov/medlineplus/prescriptiondrugabuse.html

Commonly Abused Prescription Drugs: Commonly Abused Prescription Drugs, http://www.drugabuse.gov/drugs-abuse/commonly-abused-drugs/commonly-abused-prescription-drugs-chart

FDA Authority Over Advertising: FDA, http://www.fda.gov/Drugs/ResourcesForYou/Consumers/PrescriptionDrugAdvertising/ucm071964.htm

Harmful Interactions: Mixing Alcohol with Medicines: Harmful Interactions: Mixing Alcohol with Medicines, National Institute on Alcohol Abuse and Alcoholism, NIH, http://pubs.niaaa.nih.gov/publications/Medicine/medicine.htm

? Exercise 6.4.1

1. What does prescription drug misuse mean?
2. Give one example of a commonly misused prescription drug.
3. How can misuse of prescription drugs lead to addiction?

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6.5: Drugs, Abuse, and Addiction

Many people do not understand why or how other people become addicted to drugs. It can be wrongfully assumed that drug abusers lack moral principles or willpower and that they could stop using drugs simply by choosing to change their behavior. In reality, drug addiction is a complex disease, and quitting takes more than good intentions. In fact, because drugs change the brain in ways that foster compulsive drug abuse, quitting is difficult, even for those who are ready to do so. Through scientific advances, we know more about how drugs work in the brain than ever, and we also know that drug addiction can be successfully treated to help people stop abusing drugs and lead productive lives.

Drug abuse and addiction have negative consequences for individuals and for society. Estimates of the total overall costs of substance abuse in the United States, including productivity and health- and crime-related costs, exceed $600 billion annually. This includes approximately $181 billion for illicit drugs, $193 billion for tobacco, and $235 billion for alcohol. As staggering as these numbers are, they do not fully describe the breadth of destructive public health and safety implications of drug abuse and addiction, such as family disintegration, loss of employment, failure in school, domestic violence, and child abuse.

? Optional Learning Activity

Read this short article titled: Breaking Bad Habits, Why It's So Hard to Change from *NIH News in Health.*

Wise Choices

- **Avoid tempting situations.** If you always stop for a donut on your way to work, try a different route. Keep fatty foods, cigarettes, alcohol and other tempting items out of your home.
- **Replace unhealthy behaviors with healthy ones.** Try exercise, a favorite hobby or spending time with family.
- **Prepare mentally.** If you can't avoid a tempting situation, prepare yourself in advance. Think about how you want to handle it and mentally practice what you plan.
- **Enlist support.** Ask friends, family and co-workers to support your efforts to change.
- **Reward yourself for small steps.** Give yourself a healthy treat when you've achieved a small goal or milestone.

Have you ever tried any of these strategies to break a bad habit?

What Is Drug Addiction?

Addiction is a chronic, often relapsing brain disease that causes compulsive drug seeking and use, despite harmful consequences to the addicted individual and to those around him or her. Although the initial decision to take drugs is voluntary for most people, the brain changes that occur over time challenge a person's self control and ability to resist intense impulses urging them to take drugs.

Fortunately, treatments are available to help people counter addiction's powerful disruptive effects. Research shows that combining addiction treatment medications with behavioral therapy is the best way to ensure success for most patients. Treatment approaches that are tailored to each patient's drug abuse patterns and any co-occurring medical, psychiatric, and social problems can lead to sustained recovery and a life without drug abuse.

Similar to other chronic, relapsing diseases, such as diabetes, asthma, or heart disease, drug addiction can be managed successfully. And as with other chronic diseases, it is not uncommon for a person to relapse and begin abusing drugs again. Relapse, however, does not signal treatment failure—rather, it indicates that treatment should be reinstated, adjusted, or that an alternative treatment is needed to help the individual regain control and recover.

What Happens to Your Brain When You Take Drugs?

Drugs contain chemicals that tap into the brain's communication system and disrupt the way nerve cells normally send, receive, and process information. There are two primary ways that drugs cause this disruption:

1. by imitating the brain's natural chemical messengers
2. by overstimulating the "reward circuit" of the brain

Some drugs (e.g., marijuana and heroin) have a similar structure to chemical messengers called neurotransmitters, which are naturally produced by the brain. This similarity allows the drugs to "fool" the brain's receptors and activate nerve cells to send

abnormal messages.

Other drugs, such as cocaine or methamphetamine, can cause the nerve cells to release abnormally large amounts of natural neurotransmitters (mainly dopamine) or to prevent the normal recycling of these brain chemicals, which is needed to shut off the signaling between neurons. The result is a brain awash in dopamine, a neurotransmitter present in brain regions that control movement, emotion, motivation, and feelings of pleasure. The overstimulation of this reward system, which normally responds to natural behaviors linked to survival (eating, spending time with loved ones, etc.), produces euphoric effects in response to psychoactive drugs. This reaction sets in motion a reinforcing pattern that "teaches" people to repeat the rewarding behavior of abusing drugs.

As a person continues to abuse drugs, the brain adapts to the overwhelming surges in dopamine by producing less dopamine or by reducing the number of dopamine receptors in the reward circuit. The result is a lessening of dopamine's impact on the reward circuit, which reduces the abuser's ability to enjoy the drugs, as well as the events in life that previously brought pleasure. This decrease compels the addicted person to keep abusing drugs in an attempt to bring the dopamine function back to normal, except now larger amounts of the drug are required to achieve the same dopamine high—an effect known as tolerance.

Long-term abuse causes changes in other brain chemical systems and circuits as well. Glutamate is a neurotransmitter that influences the reward circuit and the ability to learn. When the optimal concentration of glutamate is altered by drug abuse, the brain attempts to compensate, which can impair cognitive function. Brain imaging studies of drug-addicted individuals show changes in areas of the brain that are critical to judgment, decision-making, learning and memory, and behavior control. Together, these changes can drive an abuser to seek out and take drugs compulsively despite adverse, even devastating consequences—that is the nature of addiction.

Why Do Some People Become Addicted While Others Do Not?

No single factor can predict whether a person will become addicted to drugs. Risk for addiction is influenced by a combination of factors that include individual biology, social environment, and age or stage of development. The more risk factors an individual has, the greater the chance that taking drugs can lead to addiction. Consider the following risk factors:

- **Biology.** The genes that people are born with—in combination with environmental influences—account for about half of their addiction vulnerability. Additionally, gender, ethnicity, and the presence of other mental disorders may influence risk for drug abuse and addiction.
- **Environment.** A person's environment includes many different influences, from family and friends to socioeconomic status and quality of life in general. Factors such as peer pressure, physical and sexual abuse, stress, and quality of parenting can greatly influence the occurrence of drug abuse and the escalation to addiction in a person's life.
- **Development.** Genetic and environmental factors interact with critical developmental stages in a person's life to affect addiction vulnerability. Although taking drugs at any age can lead to addiction, the earlier that drug use begins, the more likely it will progress to more serious abuse, which poses a special challenge to adolescents. Because their brains are still developing in the areas that govern decision-making, judgment, and self-control, adolescents may be especially prone to risk-taking behaviors, including trying drugs of abuse.

Prevention Is the Key

Drug addiction is a preventable disease. Results from NIDA-funded research have shown that prevention programs involving families, schools, communities, and the media are effective in reducing drug abuse. Although many events and cultural factors affect drug abuse trends, when youths perceive drug abuse as harmful, they reduce their drug taking. Thus, education and outreach are key in helping youth and the general public understand the risks of drug abuse. Teachers, parents, and medical and public health professionals must keep sending the message that drug addiction can be prevented if one never abuses drugs.

? Learning Activity

Watch this video titled Anyone Can Become Addicted to Drugs:



What Is Addiction?

More than three decades of research supported by the National Institute on Drug Abuse (NIDA) has proven that addiction is a complex brain disease characterized by compulsive, at times uncontrollable, drug craving, seeking, and use that persist despite potentially devastating consequences. Addiction is also a developmental disease; that is, it usually starts in adolescence or even childhood and can last a lifetime if untreated.

Disagreements about the nature of addiction remain: namely, whether it reflects voluntary or involuntary behavior and whether it should be punished or treated as a health issue. Even though the first time a person takes a drug, it is often by choice—to achieve a pleasurable sensation or desired emotional state—we now know from a large body of research that this ability to choose can be affected by drugs. And when addiction takes hold in the brain, it disrupts a person's ability to exert control over behavior—reflecting the compulsive nature of this disease.

The human brain is an extraordinarily complex and fine-tuned communications network made up of billions of cells that govern our thoughts, emotions, perceptions, and drives. Our brains reward certain behaviors such as eating or procreating—registering these as pleasurable activities that we want to repeat. Drug addiction taps into these vital mechanisms geared for our survival. And although not a life necessity, to an addicted person, drugs become life itself, driving the compulsive use of drugs—even in the face of dire life consequences—*that is the essence of addiction*.

How Does Addiction Take Hold in the Brain?

The rewarding effects of drugs of abuse come from large and rapid upsurges in dopamine, a neurochemical critical to stimulating feelings of pleasure and to motivating behavior. The rapid dopamine "rush" from drugs of abuse mimics but greatly exceeds in intensity and duration the feelings that occur in response to such pleasurable stimuli as the sight or smell of food, for example. Repeated exposure to large, drug-induced dopamine surges has the insidious consequence of ultimately blunting the response of the dopamine system to everyday stimuli. Thus the drug disturbs a person's normal hierarchy of needs and desires and substitutes new priorities concerned with procuring and using the drug.

Drug abuse also disrupts the brain circuits involved in memory and control over behavior. Memories of the drug experience can trigger craving as can exposure to people, places, or things associated with former drug use. Stress is also a powerful trigger for craving. Control over behavior is compromised because the affected frontal brain regions are what a person needs to exert inhibitory control over desires and emotions.

That is why addiction is a brain disease. As a person's reward circuitry becomes increasingly dulled and desensitized by drugs, nothing else can compete with them—food, family, and friends lose their relative value, while the ability to curb the need to seek and use drugs evaporates. Ironically and cruelly, eventually even the drug loses its ability to reward, but the compromised brain leads addicted people to pursue it, anyway; the memory of the drug has become more powerful than the drug itself.

When does drug abuse become drug addiction? It rarely happens with the first use of a drug. Drug abuse and drug addiction can be thought of as points along a continuum. Any use of a mind-altering drug or the inappropriate use of medication (either prescription or over-the-counter drugs) is **drug abuse**, but the point when drug abuse becomes drug addiction is less clear. Different people may

reach the point of addiction at different stages. Scientists continue to investigate the factors that contribute to the transition to drug addiction.

Drug addiction is defined as the continued compulsive use of drugs despite adverse health or social consequences. Drug-addicted people have lost control of their drug use. Individuals who are addicted to drugs often become isolated from family or friends, have difficulty at work or school, may commit crimes, and become involved with the criminal justice system. For a person addicted to drugs, continuing to take them becomes the primary focus in life.

Certain drugs, including opioids and alcohol, cause strong physical reactions in the body when drug use stops. When a person addicted to heroin stops taking heroin, he or she can experience a variety of symptoms ranging from watery eyes and a runny nose to irritability and loss of appetite and then diarrhea, shivering, sweating, abdominal cramps, increased sensitivity to pain, and sleep problems. In general, withdrawal from heroin makes people feel miserable. Withdrawal from alcohol can cause serious effects such as seizures and even death. Withdrawal from other drugs, such as cocaine and amphetamines, does not lead to strong physical reactions, but it may make the person feel depressed or lethargic. For most drugs, physical withdrawal symptoms can usually be controlled effectively with medications. Even though withdrawal from some drugs does not cause the person abusing them to have physical reactions, stopping drug use is difficult because of the changes the drugs have caused in the brain. Once the drugs stop, the person will have **cravings**, or intense desire for the drugs. Craving arises from the brain's need to maintain a state of homeostasis that now relies on the presence of the drug. A person may experience cravings at any stage of drug abuse or addiction, even early in the experimentation phase of drug abuse. Cravings have a physical basis in the brain. Using PET imaging, scientists have shown that just seeing images of drug paraphernalia can stimulate the amygdala (part of the brain involved in emotional memory) in an addicted person.

Drugs of addiction do not merely cause short-term changes in an individual's cognitive skill and behavior. A drug "high" lasts a short time, ranging from less than an hour to 12 hours, depending on the drug, dose, and route of administration. The changes in the brain that result from continued drug use, however, can last a long time. Scientists believe that some of these changes disappear when drug use stops; some disappear within a short time after drug use stops, and other changes are potentially permanent.

One of the first changes in the brain that may occur in response to repeated drug abuse is tolerance. **Tolerance** develops when a person needs increasing doses of a drug to achieve the same high or "rush" that previously resulted from a lower dose of the drug. Two primary mechanisms underlie the development of tolerance. First, the body may become more efficient at metabolizing the drug, thereby reducing the amount that enters the brain. Second, the cells of the body and brain may become more resistant to the effect of the drug. For example, after continued cocaine use, neurons decrease the number of dopamine receptors, which results in decreasing cocaine's stimulatory effect. Opioids, on the other hand, do not cause a change in the number of receptors. Instead the opioid receptors become less efficient in activating associated cellular processes, thus reducing the effects of the opioids.

In addition to the functional and anatomical changes in the brain, drug abuse puts people at higher risk for other health problems. For example, inhalant abuse can lead to disruption of heart rhythms, and snorting cocaine can lead to ulcerations in the mucous membranes of the nose. In addition, injection drug users (IDUs) are at higher risk of contracting HIV through the sharing of potentially contaminated needles. Similarly, hepatitis B and hepatitis C are much more common among drug addicts than the general population. Tuberculosis is another concern. Drug abuse and addiction also are contributing factors in motor vehicle accidents.

Sources

Source: Understanding Drug Abuse and Addition, www.drugabuse.gov/publications/infofacts/understanding-drug-abuse-addiction

What Is Addiction?: The Essence of Drug Addiction by Nora Volkow, M.D., Director, National Institute on Drug Abuse,science.education.nih.gov/supplements/nih2/Addiction/guide/essence.htm

? Exercise 6.5.1

1. Define drug addiction.
2. What role does dopamine play in addiction?
3. Name one strategy used in addiction treatment.

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CHAPTER OVERVIEW

7: Aging, Dying, and Death

7.1: Profile of Older Americans
7.2: Diseases Common in Elderly Population
7.3: Aging and Mental Health
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7.1: Profile of Older Americans

Population Growth

Older adults are among the fastest growing age groups, and the first “baby boomers” (adults born between 1946 and 1964) turned 65 in 2011.*A Profile of Older Americans: 2010*, www.aoa.gov/aoaroot/aging_statistics/Profile/2010/3.aspx[/footnote]

The older population (65+) numbered 40.4 million in 2010, an increase of 5.4 million or 15.3% since 2000. The number of Americans aged 45–64—who will reach 65 over the next two decades—increased by 31% during this decade.

- Over one in every eight, or 13.1%, of the population is an older American.
- Persons reaching age 65 have an average life expectancy of an additional 18.8 years (20.0 years for females and 17.3 years for males).
- Older women outnumber older men at 23.0 million older women to 17.5 million older men.

The population 65 and over has increased from 35 million in 2000 to 40 million in 2010 (a 15% increase) and is projected to increase to 55 million in 2020 (a 36% increase for that decade). The 85+ population is projected to increase from 5.5 million in 2010 and then to 6.6 million in 2020 (19%) for that decade.

Think for Yourself

How will the upcoming increases in the percentage of older adults impact health and health services? Why does it matter?

Income

The median income of older persons in 2010 was $25,704 for males and $15,072 for females. Median money income (after adjusting for inflation) of all households headed by older people fell 1.5% (not statistically significant) from 2009 to 2010. Households containing families headed by persons 65+ reported a median income in 2010 of $45,763. The major sources of income as reported by older persons in 2009 were Social Security (reported by 87% of older persons), income from assets (reported by 53%), private pensions (reported by 28%), government employee pensions (reported by 14%), and earnings (reported by 26%). Social Security constituted 90% or more of the income received by 35% of beneficiaries in 2009 (22% of married couples and 43% of non-married beneficiaries).

Poverty

Almost 3.5 million elderly persons (9.0%) were below the poverty level in 2010. This poverty rate is not statistically different from the poverty rate in 2009 (8.9%). During 2011, the U.S. Census Bureau also released a new Supplemental Poverty Measure (SPM) which takes into account regional variations in the livings costs, non-cash benefits received, and non-discretionary expenditures but does not replace the official poverty measure. The SPM shows a poverty level for older persons of 15.9%, an increase of over 75% over the official rate of 9.0% mainly due to medical out-of-pocket expenses. About 11% (3.7 million) of older Medicare enrollees received personal care from a paid or unpaid source in 1999.

Minority Groups Over Age 65

In 2010, 20.0% of persons 65+ were minorities—8.4% were African-Americans. Persons of Hispanic origin (who may be of any race) represented 6.9% of the older population. About 3.5% were Asian or Pacific Islander, and less than 1% were American Indian or Native Alaskan. In addition, 0.8% of persons 65+ identified themselves as being of two or more races. Minority populations have increased from 5.7 million in 2000 (16.3% of the elderly population) to 8.1 million in 2010 (20% of the elderly) and are projected to increase to 13.1 million in 2020 (24% of the elderly).

- Older men were much more likely to be married than older women: 72% of men vs. 42% of women (Figure 2). 40% older women in 2010 were widows.
- About 29% (11.3 million) of non-institutionalized older persons live alone (8.1 million women, 3.2 million men).
- Almost half of older women (47%) age 75+ live alone.
- About 485,000 grandparents aged 65 or more had the primary responsibility for their grandchildren who lived with them.

Learning Activity

Use the BenefitsCheckUp tool to determine what benefit programs you might be eligible for if you were over age 65 right now.

- Complete the form as though you were born before 1945. Make estimates to answer the questions.
- Ask someone you know who is over the age of 65 to complete the form.
- Which of these benefits do you think will still be available for older adults in 2020 or 2030?

BenefitsCheckUp quickly finds federal, state, and private benefit programs available to help you save money on health care, food assistance, prescriptions, utilities, and more.

Population Growth

Source: Healthy People, healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=31

Exercise 7.1.1

1. What is one demographic trend related to the aging population in the U.S.?
2. Describe one common characteristic of older adults.
3. How has the average life expectancy changed over recent decades?

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7.2: Diseases Common in Elderly Population

More than 37 million “baby boomer” adults born between 1946 and 1964 (60 percent) will manage more than 1 chronic condition by 2030.

Older adults are at high risk for developing chronic illnesses and related disabilities. These chronic conditions include:

- Diabetes mellitus
- Arthritis
- Congestive heart failure
- Dementia

Many experience hospitalizations, nursing home admissions, and low-quality care. They also may lose the ability to live independently at home. Chronic conditions are the leading cause of death among older adults.

? Learning Activity

Interview an older adult who has a chronic illness and related disability.

Ask about:

- what it is like to deal with the health care system in order to manage the illness
- quality of life and the impact the illness has on daily activities
- caregivers

Why Is the Health of Older Adults Important?

Health Services

- Preventive health services are valuable for maintaining the quality of life and wellness of older adults. In fact, the Patient Protection and Affordable Care Act of 2010 includes provisions related to relevant Medicare services. However, preventive services are underused, especially among certain racial and ethnic groups.
- Ensuring quality health care for older adults is difficult, but the Centers for Medicare & Medicaid Services (CMS) has programs designed to improve physician, hospital, and nursing home care, among others.
- Older adults use many health care services, have complex conditions, and require professional expertise that meets their needs. Most providers receive some type of training on aging, but the percentage of those who actually specialize in this area is small. More certified specialists are needed to meet the needs of this group.

Quality of Life

- Through programs that address chronic illnesses, Federal Government agencies are improving the quality of life for older adults. To combat existing health disparities, many of these programs target minorities and underserved populations.
- The ability to complete basic daily activities may decrease if illness, chronic disease, or injury limit physical or mental abilities of older adults. These limitations make it hard for older adults to remain at home. Early prevention and physical activity can help prevent such declines. Unfortunately, less than 20 percent of older adults engage in enough physical activity, and fewer do strength training. Minority populations often have lower rates of physical activity.
- Most older adults want to remain in their communities as long as possible. Unfortunately, when they acquire disabilities, there is often not enough support available to help them. States that invest in such services show lower rates of growth in long-term care expenditures.

Injury Prevention

- Each year, 1 out of 3 older adults falls. Falls often cause severe disability among survivors. Injuries from falls lead to:
  - Fear of falling
  - Sedentary behavior
  - Impaired function
  - Lower quality of life

Falls are the leading cause of death due to unintentional injury among older adults; deaths and injuries can be prevented by addressing risk factors.

Caregivers

- Caregivers for older adults living at home are typically unpaid family members. Caregiver stress often results in unnecessary nursing home placement.
- One to 2 million older adults in the United States are injured or mistreated by a loved one or a caregiver. A measure of elder abuse has been added to encourage data collection on this issue.

Understanding the Health of Older Adults

The Healthy People 2020 objectives on older adults are designed to promote healthy outcomes for this population. Many factors affect the health, function, and quality of life of older adults.

Individual Behavioral Determinants of Health in Older Adults

Behaviors such as participation in physical activity, self-management of chronic diseases, or use of preventive health services can improve health outcomes.

Social Environment Determinants of Health in Older Adults

Housing and transportation services affect the ability of older adults to access care. People from minority populations tend to be in poorer health and use health care less often than people from nonminority populations.

Health Services-Related Determinants of Health in Older Adults

The quality of the health and social services available to older adults and their caregivers affects their ability to manage chronic conditions and long-term care needs effectively.

Emerging Issues in the Health of Older Adults

Emerging issues for improving the health of older adults include efforts to:

- Coordinate care.
- Help older adults manage their own care.
- Establish quality measures.
- Identify minimum levels of training for people who care for older adults.
- Research and analyze appropriate training to equip providers with the tools they need to meet the needs of older adults.

There is growing recognition that data sources are limited for certain subpopulations of older adults, including the aging lesbian, gay, bisexual, and transgender populations. Research for these groups will inform future health and policy initiatives.

Chronic Diseases among Older Adults

Chronic diseases are long-term illnesses that are rarely cured. Chronic diseases such as heart disease, stroke, cancer, and diabetes are among the most common and costly health conditions. Chronic health conditions negatively affect quality of life, contributing to declines in functioning and the inability to remain in the community. Many chronic conditions can be prevented or modified with behavioral interventions. Six of the seven leading causes of death among older Americans are chronic diseases.

As shown in the bar chart above, the prevalence of certain chronic conditions differs by sex. Women report higher levels of arthritis and hypertension than men. Men report higher levels of heart disease and cancer.

There are differences by race and ethnicity in the prevalence of certain chronic conditions. In 2007–2008, among people age 65 and over, non-Hispanic blacks report higher levels of hypertension and diabetes than non-Hispanic whites (71 percent compared with 54 percent for hypertension and 30 percent compared with 16 percent for diabetes). Hispanics also report higher levels of diabetes than non-Hispanic whites (27 percent compared with 16 percent), but lower levels of arthritis (42 percent compared with 51 percent).

Arthritis, Osteoporosis, and Chronic Back Conditions

Arthritis, osteoporosis, and chronic back conditions all have major effects on quality of life, the ability to work, and basic activities of daily living.

There are more than 100 types of arthritis. Arthritis commonly occurs with other chronic conditions, such as diabetes, heart disease, and obesity. Interventions to treat the pain and reduce the functional limitations from arthritis are important, and may also enable people with these other chronic conditions to be more physically active.

Osteoporosis is a disease marked by reduced bone strength leading to an increased risk of fractures (broken bones). Chronic back pain (CBP) is common, costly, and potentially disabling.

Arthritis

Arthritis affects 1 in 5 adults and continues to be the most common cause of disability. It costs more than $128 billion per year. All of the human and economic costs are projected to increase over time as the population ages.

There are interventions that can reduce arthritis pain and functional limitations, but they remain underused. These include:

- Increased physical activity
- Self-management education
- Weight loss among overweight/obese adults

Osteoporosis

In the United States, an estimated 5.3 million people aged 50 years and older have osteoporosis. Most of these people are women, but about 0.8 million are men. Just over 34 million more people, including 12 million men, have low bone mass, which puts them at increased risk for developing osteoporosis. Half of all women and as many as 1 in 4 men aged 50 years and older will have an osteoporosis-related fracture in their lifetime.

Chronic Back Conditions

About 80 percent of Americans experience low back pain (LBP) in their lifetime. It is estimated that each year:

- 15-20 percent of the population develop protracted back pain.
- 2-8 percent have chronic back pain (pain that lasts more than 3 months).
- 3-4 percent of the population is temporarily disabled due to back pain.
- 1 percent of the working-age population is disabled completely and permanently as a result of LBP.

Americans spend at least $50 billion each year on LBP. LBP is the:

- Second leading cause of lost work time (after the common cold)
- Third most common reason to undergo a surgical procedure
- Fifth most frequent cause of hospitalization

Understanding Arthritis, Osteoporosis, and Chronic Back Conditions

Arthritis

Many factors determine the pain, function, and quality of life of those with arthritis. Greater physical activity can reduce pain and improve function. However, physical activity remains an underused intervention, even though there are a variety of programs to help people with arthritis increase physical activity safely and with little pain. Self-management education can achieve similar positive outcomes by teaching people skills and techniques to deal with the day-to-day issues that result from arthritis. Weight loss among those who are overweight or obese also helps reduce symptoms of arthritis.

Osteoporosis

There are many factors that contribute to osteoporosis and fractures. Nutrition and physical activity are important modifiable (controllable) risk factors. Family history and personal history of fractures are also risk factors for osteoporosis.

Chronic Back Conditions

CBP is often progressive and its cause(s) can be difficult to determine. Most important, previous studies have shown that patients with CBP make up at least 90 percent of total spending on the treatment of lower back pain.

Emerging Issues in Arthritis, Osteoporosis, and Chronic Back Conditions

Several emerging issues may warrant future Healthy People objectives for arthritis, osteoporosis, and chronic back conditions.

- Fatigue is a clinically important symptom of many types of arthritis and other rheumatic conditions. It is often just as problematic as pain.
- Early diagnosis of inflammatory types of arthritis is of growing importance, because the early use of disease-modifying anti-rheumatic drugs has resulted in much more successful treatment of these conditions. There is a continuing effort to develop early biomarkers (both biochemical and imaging markers) of arthritis, osteoporosis, and chronic back conditions to allow adequate and early assessment and treatment of these conditions.
- Worksite accommodation will become a greater issue as the number of working-age people with arthritis and chronic back conditions increases.
- Social participation, an important part of the World Health Organization (WHO) International Classification of Functioning, Disability, and Health (ICF), should be measured for people with arthritis and other chronic conditions.
- Anxiety and depression re frequently observed outcomes associated with chronic conditions such as arthritis, osteoporosis, and chronic back conditions.
- Better measures of arthritis and chronic back pain self-management education will help focus intervention efforts.
- A greater availability of health-related quality-of-life measures will be important in order to monitor nonfatal, but chronic, disabling conditions such as arthritis, osteoporosis, and chronic back conditions.

Dementias, Including Alzheimer's Disease

Dementia is the loss of cognitive functioning—thinking, remembering, and reasoning—to such an extent that it interferes with a person's daily life. Dementia is not a disease itself, but rather a set of symptoms. Memory loss is a common symptom of dementia, although memory loss by itself does not mean a person has dementia. Alzheimer's disease is the most common cause of dementia, accounting for the majority of all diagnosed cases.

Diagnosis of dementia is key to effective treatment and care. It is important to distinguish dementia from temporary, reversible conditions that may cause loss of cognitive functioning. Temporary, reversible conditions include:

- Series of strokes
- Side effects from medication
- Chronic alcoholism
- Some tumors and infections in the brain
- Vitamin B12 deficiency
- Dehydration

These conditions are not dementia, but they can be serious and should be treated by a doctor as soon as possible.

Why Are Dementias, Including Alzheimer's Disease, Important?

Alzheimer's disease is the 6th leading cause of death among adults aged 18 years and older. Estimates vary, but experts suggest that up to 5.1 million Americans aged 65 years and older have Alzheimer's disease. These numbers are predicted to more than double by 2050 unless more effective ways to treat and prevent Alzheimer's disease are found.

Dementia affects an individual's health, quality of life, and ability to live independently. It can diminish a person's ability to effectively:

- Manage medications and medical conditions.
- Maintain a bank account.
- Drive a car or use appliances safely.
- Avoid physical injury.
- Maintain social relationships.

- Carry out activities of daily living, such as bathing or dressing.

People living with dementia are at greater risk for general disability and experience frequent injury from falls. Older adults with dementia are 3 times more likely to have preventable hospitalizations. As their dementia worsens, people need more health services and, oftentimes, long-term care. Many individuals requiring long-term care experience major personal and financial challenges that affect their families, their caregivers, and society.

There are important steps to take to improve the identification of and care for people with dementia. These include:

- Increasing the availability of existing effective diagnostic tools.
- Decreasing the number of people with undiagnosed dementia.
- Reducing the severity of symptoms through better medical management.
- Supporting family caregivers with social, behavioral, and legal resources.
- Encouraging healthy behaviors to reduce the risk of co-occurring conditions.

Understanding Dementias, Including Alzheimer's Disease

Several factors determine the risk of developing dementia, including age and family history. Other factors affect the management of dementia by families, communities, and the health care system.

Age

Aging is a well-known risk factor for Alzheimer's disease and other types of dementias. Among adults aged 65 years and older, the prevalence of Alzheimer's disease doubles every 5 years.

Family History

People with a family history of Alzheimer's disease are generally considered to be at greater risk of developing the disease. Researchers have identified 3 genes that are linked to early-onset Alzheimer's disease. Until recently, only 1 gene had been identified that increases the risk of late-onset Alzheimer's disease. However, during 2009 and 2010, international teams studying the genetics of Alzheimer's disease have identified and confirmed 3 new genes that are associated with increased risk of late-onset Alzheimer's disease.

Health Services

Many individuals with Alzheimer's disease or other dementias are undiagnosed. Primary care providers do not routinely test for Alzheimer's disease. Alzheimer's disease and other dementias are more often undiagnosed in rural and minority populations than in urban or white populations.

Some chronic conditions are common in people with Alzheimer's disease and other dementias. Dementias can greatly complicate the medical management of these conditions; this increases the need for coordination of care among different specialists.

Lack of diagnosis seriously reduces a person's access to available treatments and valuable information. Active medical management, information and support, and coordination of medical and community services have been shown to improve quality and outcomes of care for people with dementia.

Emerging Issues in Dementias, Including Alzheimer's Disease

Over the past decade, there has been significant scientific progress in understanding and managing dementia, with most of the research focused on Alzheimer's disease. During the next decade, it will be important that progress be made in:

- Improving the early diagnosis of Alzheimer's disease and other dementias.
- Developing interventions to delay or prevent Alzheimer's disease and other dementias.
- Finding better ways to manage dementia when other chronic conditions are present.
- Understanding the influence of lifestyle factors on a person's risk of cognitive decline and dementia.

Think for Yourself

If you had the opportunity to decide how to spend some limited funding to improve the health of older adults, how would spend it? Why?

- Spend it all on a specific condition?
- Which condition?
- Spend it on prevention, treatment, or cure?
- Spend it on national, state, or local efforts?

Sources

Source: Healthy People, healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=31

Chronic Diseases among Older Adults: www.agingstats.gov/agingstatsdotnet/Main_Site/Data/2010_Documents/Docs/OA_2010.pdf

Arthritis, Osteoporosis, and Chronic Back Conditions: healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=3

Dementias, Including Alzheimer's Disease: Healthy People, healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=7

Exercise 7.2.1

1. Name two diseases commonly affecting older adults.
2. How does arthritis impact daily living for elderly individuals?
3. Why are older adults at higher risk for chronic diseases?

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7.3: Aging and Mental Health

It is estimated that 20% of people age 55 years or older experience some type of mental health concern. The most common conditions include anxiety, severe cognitive impairment, and mood disorders (such as depression or bipolar disorder). Mental health issues are often implicated as a factor in cases of suicide. **Older men have the highest suicide rate of any age group.** Men aged 85 years or older have a suicide rate of 45.23 per 100,000, compared to an overall rate of 11.01 per 100,000 for all ages.

Social Support

Social support serves major support functions, including emotional support (e.g., sharing problems or venting emotions), informational support (e.g., advice and guidance), and instrumental support (e.g., providing rides or assisting with housekeeping).

- Adequate social and emotional support is associated with reduced risk of mental illness, physical illness, and mortality
- The majority (nearly 90%) of adults age 50 or older indicated that they are receiving adequate amounts of support.
- Adults age 65 or older were more likely than adults age 50–64 to report that they "rarely" or "never" received the social and emotional support they needed (12.2% compared to 8.1%, respectively).
- Approximately one-fifth of Hispanic and other, non-Hispanic adults age 65 years or older reported that they were not receiving the support they need, compared to about one-tenth of older white adults.
- Among adults age 50 or older, men were more likely than women to report they "rarely" or "never" received the support they needed (11.39% compared to 8.49%).

Depression is Not a Normal Part of Growing Older

Depression is a true and treatable medical condition, not a normal part of aging. However older adults are at an increased risk for experiencing depression. If you are concerned about a loved one, offer to go with him or her to see a health care provider to be diagnosed and treated.

Depression is not just having "the blues" or the emotions we feel when grieving the loss of a loved one. It is a true medical condition that is treatable, like diabetes or hypertension.

How Do I Know If It's Depression?

Someone who is depressed has feelings of sadness or anxiety that last for weeks at a time. He or she may also experience

- Feelings of hopelessness and/or pessimism
- Feelings of guilt, worthlessness and/or helplessness
- Irritability, restlessness
- Loss of interest in activities or hobbies once pleasurable
- Fatigue and decreased energy
- Difficulty concentrating, remembering details and making decisions
- Insomnia, early-morning wakefulness, or excessive sleeping
- Overeating or appetite loss
- Thoughts of suicide, suicide attempts
- Persistent aches or pains, headaches, cramps, or digestive problems that do not get better, even with treatment

How is Depression Different for Older Adults?

- **Older adults are at increased risk.** We know that about 80% of older adults have at least one chronic health condition, and 50% have two or more. Depression is more common in people who also have other illnesses (such as heart disease or cancer) or whose function becomes limited.
- **Older adults are often misdiagnosed and undertreated.** Healthcare providers may mistake an older adult's symptoms of depression as just a natural reaction to illness or the life changes that may occur as we age, and therefore not see the depression as something to be treated. Older adults themselves often share this belief and do not seek help because they don't understand that they could feel better with appropriate treatment.

How Many Older Adults Are Depressed?

The good news is that the majority of older adults are *not* depressed. Some estimates of major depression in older people living in the community range from less than 1% to about 5% but rise to 13.5% in those who require home healthcare and to 11.5% in older hospital patients.

? Optional Learning Activity

Use the interactive maps at this website to determine The State of Mental Health and Aging in America. You can explore different aspects of health by adjusting the Location and Category filters. You can also read this a summary of the information.

Sources

Mental Health Problems in Older Adults: CDC, http://www.cdc.gov/aging/pdf/mental_health.pdf

Depression is Not a Normal Part of Growing Older: http://www.cdc.gov/aging/mentalhealth/depression.htm

? Exercise 7.3.1

1. What is one mental health condition frequently seen in older adults?
2. How can social isolation affect the mental health of elderly individuals?
3. Name one strategy to support mental well-being in older adults.

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7.4: Healthy Aging

Implications of an Aging Society

By 2030, the number of U.S. adults aged 65 or older will more than double to about 71 million. The rapidly increasing number of older Americans has far-reaching implications for our nation's public health system and will place unprecedented demands on the provision of health care and aging-related services. Public health efforts to promote health and functional independence are critical strategies in helping older adults stay healthy. Research has shown that poor health does not have to be an inevitable consequence of aging. Older adults who practice healthy behaviors, take advantage of clinical preventive services, and continue to engage with family and friends are more likely to remain healthy, live independently, and incur fewer health-related costs.

An essential component to keeping older adults healthy is preventing chronic diseases and reducing associated complications. About 80% of older adults have one chronic condition, and 50% have at least two. Infectious diseases (such as influenza and pneumococcal disease) and injuries also take a disproportionate toll on older adults. Efforts to identify strategies to prevent or reduce the risk of disease and injury and to widely apply effective interventions must be pursued.

Tips on how to stay healthy, get good health care, and manage lifestyle changes as you age are available at Healthy Aging at NIH Senior Health.

Sources

Source: *Helping People To Live Long and Productive Lives and Enjoy a Good Quality Of Life: At a Glance* 2011, www.cdc.gov/chronicdisease/resources/publications/AAG/aging.htm

? Exercise 7.4.1

1. List two behaviors that promote healthy aging.
2. Why is regular physical activity important for older adults?
3. How can diet influence the aging process?

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7.5: Safety

Falls Among Older Adults: An Overview

Each year, one in every three adults age 65 and older falls. Falls can cause moderate to severe injuries, such as hip fractures and head traumas, and can increase the risk of early death. Fortunately, falls are a public health problem that is largely preventable.

How big is the problem?

- One out of three adults age 65 and older falls each year, but less than half talk to their healthcare providers about it.
- Among older adults (those 65 or older), falls are the leading cause of injury death. They are also the most common cause of nonfatal injuries and hospital admissions for trauma.
- In 2008, over 19,700 older adults died from unintentional fall injuries.
- In 2009, 2.2 million nonfatal fall injuries among older adults were treated in emergency departments and more than 581,000 of these patients were hospitalized.
- In 2000, direct medical costs of falls totaled a little over $19 billion—$179 million for fatal falls and $19 billion for nonfatal fall injuries. This equals $28.2 billion in 2010 dollars.

What outcomes are linked to falls?

- Twenty to thirty percent of people who fall suffer moderate to severe injuries such as lacerations, hip fractures, or head traumas. These injuries can make it hard to get around or live independently, and increase the risk of early death.
- Falls are the most common cause of traumatic brain injuries (TBI). In 2000, TBI accounted for 46% of fatal falls among older adults.
- Most fractures among older adults are caused by falls. The most common are fractures of the spine, hip, forearm, leg, ankle, pelvis, upper arm, and hand.
- Many people who fall, even if they are not injured, develop a fear of falling. This fear may cause them to limit their activities leading to reduced mobility and loss of physical fitness, which in turn increases their actual risk of falling.

Who is at risk?

Fall-related Deaths

- In 2008, 82% of fall deaths were among people 65 and older.
- Men are more likely to die from a fall. After taking age into account, the fall death rate in 2007 was 46% higher for men than for women.
- Older whites are 2.5 times more likely to die from falls as their black counterparts.
- Rates also differ by ethnicity. Older non-Hispanics have higher fatal fall rates than Hispanics.

Fall Injuries

- The chances of falling and of being seriously injured in a fall increase with age. In 2009, the rate of fall injuries for adults 85 and older was almost four times that for adults 65 to 74.
- People age 75 and older who fall are four to five times more likely than those age 65 to 74 to be admitted to a long-term care facility for a year or longer.
- Women are more likely than men to be injured in a fall. In 2009, women were 58% more likely than men to suffer a nonfatal fall injury.
- Rates of fall-related fractures among older women are more than twice those for men.
- Over 90% of hip fractures are caused by falls. In 2007, there were 264,000 hip fractures and the rate for women was almost three times the rate for men.
- White women have significantly higher hip fracture rates than black women.

How can older adults reduce risk?

To lower their hip fracture risk, older adults can:

- Get adequate calcium and vitamin D—from food and/or from supplements.
- Do weight bearing exercise.

- Get screened and treated for osteoporosis.

Falls in the Bathroom

Activities that take place in the bathroom, such as showering and bathing, are a simple part of most peoples' daily routine. Yet, slips in the tub and falls in the shower or from the toilet may cause serious injuries.

According to a CDC study published in the *Morbidity and Mortality Weekly Report*, an estimated 234,000 people ages 15 and older were treated in U.S. emergency departments (ED) in 2008 for injuries that occurred in bathrooms. Four out of 5 of these injuries were caused by falls—which can have especially serious consequences for older adults.

Almost one-third (30 percent) of adults aged 65 and above who were injured in bathrooms were diagnosed with fractures. Among adults aged 85 and older, 38 percent were hospitalized as a result of their injuries.
Read the new CDC study on bathroom injuries and the related press release.

Steps for Safety in the Bathroom

Certain home safety measures may reduce the risk for all household members of being injured in the bathroom. Some prevention strategies include:

- Adding non-slip surfaces and grab bars inside and outside the tub or shower to reduce slips and falls.
- Installing grab bars next to the toilet for added support, if needed.

Preventing Falls among Older Adults

Four out of five injuries that took place in bathrooms in 2008 were the result of falls. Falls can be especially dangerous for adults ages 65 and older.

Older adults can take steps to make falls less likely. If you are 65 or older, take the following steps to reduce your risk of falling:

- **Get some exercise**: Lack of exercise can lead to weak legs, which increases the chance of falling. Exercise programs like Tai Chi can increase strength as well as improve balance, making falls less likely for aging adults.
- **Be mindful of medications:** Some medicines—or combinations of medicines—can have side effects like dizziness or drowsiness. This can make falls more likely. Having a doctor or pharmacist review all your medications can help reduce the chance of risky side effects and drug interactions.
- **Keep your vision sharp:** Poor vision can make it harder to get around safely. To help make sure you're seeing clearly, have your eyes checked every year and wear glasses or contact lenses with the right prescription strength.
- **Eliminate hazards at home.** About half of all falls happen at home. A home safety check can help identify fall hazards, like clutter and poor lighting that should be removed or changed.

? Learning Activity

Make your own home safe for older adults.

- What would you need to do to make your home safer for older adults?
- How much would it cost and how much time would it take for you to make these changes?

Violence Elder Abuse

Elder maltreatment includes several types of violence that occur among those ages 60 and older. The violence usually occurs at the hands of a caregiver or a person the elder trusts. There are six types of elder maltreatment:

- Physical—This occurs when an elder is injured as a result of hitting, kicking, pushing, slapping, burning, or other show of force.
- Sexual—This involves forcing an elder to take part in a sexual act when the elder does not or cannot consent.
- Emotional—This refers to behaviors that harm an elder's self-worth or emotional well being. Examples include name calling, scaring, embarrassing, destroying property, or not letting the elder see friends and family.
- This is the failure to meet an elder's basic needs. These needs include food, housing, clothing, and medical care.
- This happens when a caregiver leaves an elder alone and no longer provides care for him or her.

- Financial—This is illegally misusing an elder's money, property, or assets.

Elder maltreatment can have several physical and emotional effects on an elder.

Many victims suffer physical injuries. Some are minor like cuts, scratches, bruises, and welts. Others are more serious and can cause lasting disabilities. These include head injuries, broken bones, constant physical pain, and soreness. Physical injuries can also lead to premature death and make existing health problems worse.

Elder maltreatment can have emotional effects as well. Victims are often fearful and anxious. They may have problems with trust and be wary around others.

Many cases are not reported because elders are afraid to tell police, friends, or family about the violence. Victims have to decide: tell someone they are being hurt or continue being abused by someone they depend upon or care for deeply.

Risk Factors

A combination of individual, relational, community, and societal factors contribute to the risk of becoming a perpetrator of elder maltreatment. They are contributing factors and may or may not be direct causes.

Understanding these factors can help identify various opportunities for prevention.

Risk Factors for Perpetration

- Individual Level
  - Current diagnosis of mental illness
  - Current abuse of alcohol
  - High levels of hostility
  - Poor or inadequate preparation or training for care giving responsibilities
  - Assumption of caregiving responsibilities at an early age
  - Inadequate coping skills
  - Exposure to maltreatment as a child
- Relationship Level
  - High financial and emotional dependence upon a vulnerable elder
  - Past experience of disruptive behavior
  - Lack of social support
- Community Level
  - Formal services, such as respite care for those providing care to elders, are limited, inaccessible, or unavailable
- Societal Level
  - A culture where there is high tolerance and acceptance of aggressive behavior.
  - A culture where health care personnel, guardians, and other agents are given greater freedom in routine care provision and decision making.
  - A culture where family members are expected to care for elders without seeking help from others.
  - A culture where persons are encouraged to endure suffering or remain silent regarding their pains.
  - A culture where there are negative beliefs about aging and elders.

In addition to the above factors, there are also specific characteristics of institutional settings that may increase the risk for perpetration of vulnerable elders in these settings, including: unsympathetic or negative attitudes toward residents, chronic staffing problems, lack of administrative oversight, staff burnout, and stressful working conditions.

Protective Factors for Elder Maltreatment

Protective factors reduce risk for perpetrating abuse and neglect. Protective factors have not been studied as extensively or rigorously as risk factors. However, identifying and understanding protective factors are equally as important as researching risk factors.

Several potential protective factors are identified below. Research is needed to determine whether these factors do indeed buffer elders from maltreatment.

The goal is to stop elder maltreatment before it starts. While not much research has been done, there are several things we can do to prevent it:

- Listen to elders and their caregivers
- Report abuse or suspected abuse to Adult Protective Services
- Educate oneself and others about how to recognize and report elder abuse
- Learn how the signs of elder abuse differ from the normal aging process
- If you take care of an elder here are some things you can do to prevent violence:
- Get help from friends, family, or local relief care groups
- Take a break—if only for a couple of hours
- Involve more people than just family in financial matters
- Find an adult day care program
- Seek counseling or other support if you are feeling depressed
- If you are having problems with drug or alcohol abuse, get help

Sources

Falls Among Older Adults: An Overview: www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html

Falls in the Bathroom: http://www.cdc.gov/features/fallrisks/

Violence Elder Abuse: Centers for Disease Control, http://www.cdc.gov/violenceprevention/pdf/EM-FactSheet-a.pdf

? Exercise 7.5.1

1. What is one common safety hazard for elderly people at home?
2. How can falls be prevented among older adults?
3. Why is medication management important for the elderly?

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7.6: Ageism

In the 1960s, Robert Butler coined the phrase ageism, which he defined as:

> A process of systematic stereotyping of and discrimination against people because they are old, just as racism and sexism accomplish this with skin color and gender. Old people are categorized as senile, rigid in thought and manner, old-fashioned in morality and skills. . . . Ageism allows the younger generations to see older people as different from themselves; thus they subtly cease to identify with their elders as human beings.
>
> —R. Butler, *Why Survive? Being Old in America*, 1975

While some advocates for elders suggest that ageism is a cause of elder abuse, neglect, and exploitation, we do not have enough valid research into the attitudes of known perpetrators of elder mistreatment to be able to definitively make that statement. However, as the following references indicate, ageism contributes to conditions that disadvantage and marginalize older individuals in society.

Inequitable treatment occurring in the workplace, in the health care sector, and in the legal arena appears to be based, at least in part, on age discrimination. Even efforts to offer protection may be based upon compassionate ageism that may lead to disempowerment. Ageist beliefs and policies categorize seniors as a homogenous group, ignoring diversity issues and individual needs. Furthermore, it appears that aging individuals are not only subjected to ageist beliefs by others; they internalize these beliefs as well. Age discrimination can impact elders in tangible ways by contributing to reduced financial security and poorer health outcomes, but also appears to a have subtler, though perhaps more pervasive impact, by contributing to social isolation (a risk factor for mistreatment), lower self-esteem and poorer quality of life. When combined with other prejudices, such as sexism, racism and biases against the disabled (known as “ableism”), the health and well-being of elders is further jeopardized.

? Learning Activity

Take the Implicit Association Test (IAT) on aging and reflect on your results then ask someone else to take the IAT and interview that person about the results.

- How might the results may impact your attitudes?

Consequences of Attributing Illness to Old Age

Stereotypic beliefs about older adults and the aging process have led to endorsement of the myth that “to be old is to be ill.” A study on older adults’ beliefs about the causes of their chronic illness (i.e., heart disease, cancer, diabetes, etc.), found that attributing an illness to “old age” is associated with negative health outcomes. ‘Old age’ attributions were associated with more frequent perceived health symptoms, poorer health maintenance behaviors and a greater likelihood of mortality. The probability of death was more than double among those who strongly attributed illness symptoms to “old age” as compared to those who did not. [1]

Sources

Source: Ageism, NCEA, AOA, www.ncea.aoa.gov/main_site/library/cane/CANE_Series/CANE_ageism.aspx

1. Stewart TL, Chipperfield JG, Perry RP, Weiner B. (2011). *Attributing illness to 'old age:' Consequences of a self-directed stereotype for health and mortality*. Psychol Health. http://www.ncbi.nlm.nih.gov/pubmed/22149693↵

? Exercise 7.6.1

1. Define ageism.
2. How can ageism negatively impact older adults?
3. Name one way to combat ageism in society.

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7.7: End-of-Life Issues

Life Expectancy

Life expectancy is a summary measure of the overall health of a population. It represents the average number of years of life remaining to a person at a given age if death rates were to remain constant. In the United States, improvements in health have resulted in increased life expectancy and contributed to the growth of the older population over the past century.

Americans are living longer than ever before. Life expectancies at both age 65 and age 85 have increased. Under current mortality conditions, people who survive to age 65 can expect to live an average of 18.5 more years, about 4 years longer than people age 65 in 1960. The life expectancy of people who survive to age 85 today is 6.8 years for women and 5.7 years for men.

Life expectancy varies by race, but the difference decreases with age. In 2006, life expectancy at birth was 5 years higher for white people than for black people. At age 65, white people can expect to live an average of 1.5 years longer than black people. Among those who survive to age 85, however, the life expectancy among black people is slightly higher (6.7 years) than white people (6.3 years).

Life expectancy at age 65 in the United States is lower than that of many other industrialized nations. In 2005, women age 65 in Japan could expect to live on average 3.7 years longer than women in the United States. Among men, the difference was 1.3 years.

Heart disease and cancer are the top two leading causes of death among all people age 65 and over, irrespective of sex, race, or Hispanic origin. Other causes of death vary among older people by sex and race and Hispanic origin. For example, men have higher suicide rates than do women at all ages, with the largest difference occurring at age 85 and over (43 deaths per 100,000 population for men compared with 3 per 100,000 for women). Non-Hispanic white men age 85 and over have the highest rate of suicide overall at 48 deaths per 100,000.

End-of-Life Issues

Sometimes, in spite of treatment, a condition or illness will cause death. In those cases, patients can decide what they do and do not want done. They can decide whether they want aggressive treatment that might prolong life or whether they prefer to stop treatment, which could mean dying sooner but more comfortably. They may want to plan their own funeral. Advance directives can help make the patient's wishes clear to families and health care providers.

Care at the end of life focuses on making patients comfortable. They still receive medicines and treatments to control pain and other symptoms. Some patients choose to die at home. Others enter a hospital or a hospice. Either way, services are available to help patients and their families deal with issues surrounding death.

> For more about dying and death, read End of Life: Helping With Comfort and Care, a 68-page guide that discusses finding hospice care, what happens at the time of death, managing grief, and preparing advance directives along with resources for more information.

Costs of End-of-Life Care

End-of-life care is often a controversial subject, and when policymakers are looking for ways to control Medicare costs, such care typically comes up in the discussion. That's not surprising, because end-of-life care accounted for more than one-quarter of Medicare spending last year, according to background information in the study. One concern is that this spending may be largely earmarked for aggressive care that's not necessarily what the patient might have wanted.

And, that's where advance directives can be useful. They allow patients to document their wishes, whether they want all life-sustaining measures to be taken or if they'd prefer to avoid such procedures.

Advance Directives

What kind of medical care would you want if you were too ill or hurt to express your wishes? Advance directives are legal documents that allow you to convey your decisions about end-of-life care ahead of time. They provide a way for you to communicate your wishes to family, friends and health care professionals, and to avoid confusion later on.

A living will tells how you feel about care intended to sustain life. You can accept or refuse medical care. There are many issues to address, including

- The use of dialysis and breathing machines
- If you want to be resuscitated if breathing or heartbeat stops
- Tube feeding
- Organ or tissue donation

A durable power of attorney for health care is a document that names your health care proxy. Your proxy is someone you trust to make health decisions if you are unable to do so.

? Optional Learning Activity

Watch this video about advance care planning:



- Have YOU made your health care wishes known to someone?

Hospice Care

Hospice care is end-of-life care provided by health professionals and volunteers. They give medical, psychological and spiritual support. The goal of the care is to help people who are dying have peace, comfort and dignity. The caregivers try to control pain and other symptoms so a person can remain as alert and comfortable as possible. Hospice programs also provide services to support a patient's family.

Usually, a hospice patient is expected to live 6 months or less. Hospice care can take place

- At home
- At a hospice center
- In a hospital
- In a skilled nursing facility

Sources

Life Expectancy: www.agingstats.gov/agingstatsdotnet/Main_Site/Data/2010_Documents/Docs/OA_2010.pdf

End-of-Life Issues: NLM, NIH, http://www.nlm.nih.gov/medlineplus/endoflifeissues.html

Costs of End-of-Life Care: Advance Directives Might Curb Cost of End-of-Life Care by Serena Gordon, *Health News*, www.healthfinder.gov/news/newsstory.aspx?Docid=657551

Advance Directives: NIH, *Medline*,http://www.nlm.nih.gov/medlineplus/advancedirectives.html

Hospice Care: NIH, *Medline*,http://www.nlm.nih.gov/medlineplus/hospicecare.html

Exercise 7.7.1

1. What is one common concern people have about end-of-life care?
2. Explain the purpose of advance directives.
3. How can hospice care support patients and families?

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CHAPTER OVERVIEW

8: Diseases and Disorders

Learning Objectives

- examine and discuss the role of epidemiology in public health
- recognize, examine and formulate the importance of immunization
- identify the major means of transmission for communicable diseases
- identify and examine immunizations in relationship to immunity
- differentiate the major classifications of communicable and non-communicable diseases

8.1: Introduction to Epidemiology
8.2: Noncommunicable Diseases and Disorders
8.3: Cardiovascular Diseases and Disorders
8.4: Cancer
8.5: Communicable (Infectious) Diseases
8.6: Immunity and Immunizations

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8.1: Introduction to Epidemiology

This background lesson provides several working definitions of epidemiology—the basic science of public health; an introduction to the different categories of epidemiology and types of epidemiological studies; and an overview of the disease transmission cycle. First, to set the stage, consider the three incidents that follow, stepping into the shoes of the public health officer who received the initial report and asking yourself the question, "What do I do now?" Some of these examples made national news and may be familiar to you.

First Incident

In March 1985, a nurse epidemiologist in a county health department noted, while reviewing surveillance data, three cases in a single month of hepatitis B of unusual origin. Hepatitis B, or serum hepatitis, is transmitted through sexual contact and by exposure to infected bodily fluids, but these three patients did not seem to have the usual risk factors. All three people did, however, indicate having received injections at the same health care facility.

The nurse's immediate questions were: *"Is this a coincidence? Did these three cases occur by chance or is there a link?"* In this instance, the nurse decided to pursue an investigation.

Second Incident

At 8:30 in the morning on August 2, 1976, Dr. Robert B. Craven of Centers for Disease Control's (CDC) Viral Diseases Division received a call from a nurse at a Veterans' Hospital in Philadelphia, Pennsylvania. The nurse reported two cases of severe respiratory illness, one of which had been fatal. Both people had attended the annual American Legion Convention held July 21-24. By the evening of August 2, 71 more of the people attending the convention had the same illness, with symptoms of acute onset of fever, chills, headache, malaise, dry cough, and myalgia. Further conversations with local and state public health officials revealed that between July 26 and August 2, 18 conventioneers had died. Deaths were due primarily to pneumonia.

An intense investigation began immediately. The incident became known as the first outbreak of Legionnaires' disease and led to the discovery of the gram-negative pathogen, *Legionnella pneumophila*.

Third Incident

On October 30, 1989, a New Mexico physician notified the state's health department of three patients with marked peripheral eosinophilia and severe myalgia. All three patients had been taking oral preparations of L-tryptophan, a nonprescription drug sold as a dietary supplement in health food stores. Despite extensive clinical evaluation and testing, the illness could not be identified.

An investigation followed and resulted in the characterization of eosinophilia-myalgia syndrome, EMS. The investigation implicated a vehicle for exposure—L-tryptophan dietary supplements—before a suspected agent was identified, and the product was taken off the market. Eventually, the problem was traced to a contaminant that had been introduced by changes in the production process at a single manufacturing facility.

These three examples illustrate some of the key reasons for needing applied, or field, epidemiology:

- They were unexpected.
- They demanded a response.
- The investigators had to go out into the field to solve the problem.

Epidemiology Defined

A definition of epidemiology is "the study of the distribution and determinants of health-related states in specified populations, and the application of this study to control health problems." A look at the key words will help illuminate the meaning:

- Epidemiology is the basic science of public health. It's a highly quantitative discipline based on principles of statistics and research methodologies.
- Distribution Epidemiologists study the distribution of frequencies and patterns of health events within groups in a population. To do this, they use descriptive epidemiology, which characterizes health events in terms of time, place, and person

- Determinant Epidemiologists also attempt to search for causes or factors that are associated with increased risk or probability of disease. This type of epidemiology, where we move from questions of “who,” “what,” “where,” and “when” and start trying to answer “how” and “why,” is referred to as analytical epidemiology

A comparison between the practice of public health and the more familiar practice of health care helps in describing epidemiology. First, where health care practitioners collect data on an individual patient by taking a medical history and conducting a physical exam, epidemiologists collect data about an entire population through surveillance systems or descriptive epidemiological studies. The health care practitioner uses his or her data to make a differential diagnosis. The epidemiologist’s data is used to generate hypotheses about the relationships between exposure and disease. Both disciplines then test the hypotheses, the health care practitioner by conducting additional diagnostic studies or tests, the epidemiologist by conducting analytical studies such as cohort or case-control studies. The final step is to take action. The health care practitioner prescribes medical treatment, and the epidemiologist, some form of community intervention to end the health problem and prevent its recurrence.

Health Care Professional	Epidemiologist
Collects data on an individual patient by taking a medical history and conducting a physical exam	Collects data about an entire population through surveillance systems or descriptive epidemiological studies
Uses his or her data to make a differential diagnosis	Data is used to generate hypotheses about the relationships between exposure and disease
Tests the hypothesis by conducting additional diagnostic studies or tests	Tests the hypothesis by conducting analytical studies such as cohort or case-control studies
Prescribes medical treatment	Develops community intervention to end the health problem and prevent its recurrence

One way to sum up the task of epidemiologists is to say that they “count things.” Basically, epidemiologists count cases of disease or injury, define the affected population, and then compute rates of disease or injury in that population. Then they compare these rates with those found in other populations and make inferences regarding the patterns of disease to determine whether a problem exists.

For example, in the hepatitis B example earlier, you might ask: Is the rate of disease among people with no know risk factors greater than we would expect? Is the pattern or distribution of the cases suspicious? Once a problem has been identified, the data are used to determine the cause of the health problem; the modes of transmission; any factors that are related to susceptibility, exposure, or risk; and any potential environmental determinants.

Epidemiological Studies

As mentioned earlier, epidemiologists used several different types of studies. Simply speaking, these can be classified as either **experimental**, where the epidemiologists have control over the circumstances from the start, or **observational**, where they do not. Vaccine efficacy trials are a good example of experimental studies because investigators control who gets the vaccine and who doesn’t. Observational studies can be further subdivided into **descriptive** and **analytical** studies. In a descriptive study, the epidemiologist collects information to characterize and summarize the health event or problem. In an analytical study, the epidemiologist relies on comparisons between groups to determine the role of various risk factors in causing the problem. Descriptive epidemiology is the most basic of these categories and is fundamental to the work of an epidemiologists.

Another way of comparing descriptive and analytical epidemiology is to say that in the descriptive process, we are concerned with “person” (Who was affected?), “place” (Where were they affected?), and time (When were they affected?). Once we know the answers to these questions, we can enter the realm of analytical epidemiology and ask how and why these people were affected.

Disease Transmission

In talking about epidemiology, it is important to review how outbreaks occur. First, we’ll look at three commonly used, and often misunderstood, terms: “epidemic,” “outbreak,” and “cluster.” An **epidemic** is the occurrence of more cases of disease than would normally be expected in a specific place or group of people over a given period of time. To an epidemiologist, “**outbreak**” means

basically the same thing. In the public's mind, however, "epidemic" has a far more serious connotation than "outbreak." For this reason, "outbreak" is often used to avoid sensationalism. The third term, "**cluster**," is occasionally used, incorrectly, in place of "epidemic" or "outbreak." A cluster is a group of cases in a specific time and place that may or may not be greater than the expected rate. Often the aim of investigating clusters is to determine the baseline rate of disease for that time and place. Two other terms you will come across are "**endemic**," meaning a high background rate of disease, and "**pandemic**," meaning very widespread, often global, disease.

? Learning Activity

Watch this TED-Ed video: How Pandemics Spread and take the Quick Quiz.

- Why are epidemics and pandemics a relatively recent phenomenon in human history?

For an outbreak, or epidemic, to occur, the basic elements of disease causation and an adequate chain of transmission must be present. Disease occurs when an outside **agent** capable of causing the disease meets a **host** that is vulnerable to the agent in an **environment** that allows the agent and host to interact. Then, given a chain of transmission from one host to another and a suitable mode of spread, an outbreak can develop. These basic concepts help guide the selection of public health strategies to prevent health problems. Depending on which approach might be most effective, we might direct efforts at the specific agent (e.g., guinea worm), host (e.g., immunization to prevent measles), or environment (e.g., sanitation improvements to prevent salmonella). We can also target a specific point in the chain of transmission. This was the response in the E.coli outbreak in Washington State in the early 1990s, when health officials called for the thorough cooking of hamburgers to interrupt transmission of the bacterium.

The **host** is the person, or in a more generic definition, the organism, that is susceptible to the effect of the agent. The status of the host is quite important and is generally classifiable as susceptible, immune, or infected. Finally, and also quite important, is that the host's response to exposure can vary widely, from showing no effect to manifesting illness.

The **environment** is the conditions or influences that are not part of either the agent or the host, but that influence their interaction. A wide variety of factors, including physical, climatologic, biologic, social, and economic conditions, can come into play. For instance, in a study of motor vehicle injuries, the agent (mechanical energy) and the host (driver) could be affected by the topography, the weather, and the actions of other drivers. In many infectious disease outbreaks, social and economic conditions cause overcrowding and lead to high levels of exposure.

Agent, host, and environment alone are not sufficient to cause an epidemic; an adequate chain of transmission must be present. This process requires a source for the agent, a portal of exit, a mode of transmission, and a portal of entry. The first element, the **source for the agent**, is often the place where the agent originates, where it lives, grows, and multiplies, but this is not always the case. The agent that causes botulism (*Clostridium botulinum*), for example, originates in soil, but the source of most botulism infections is improperly canned food containing *C. botulinum* spores.

The second element, a **portal of exit**, is a pathway by which the agent can leave the source. This pathway is usually related to the place where the agent is localized. For instance, the agents causing tuberculosis and the flu are released through the respiratory tract, whereas agents for many stomach ailments are released through the digestive tract. Agents found in the blood, such as hepatitis B and HIV, can be released through cuts or needles.

Once the agent leaves the source, a **mode of transmission**, or means of carrying it to the host, is needed. This can happen in a number of ways, some of which are direct and some indirect. **Direct transmission** includes contact with soil or plants as well as contact between people. In **indirect transmission**, the agent can be **airborne**, **vector borne**, or **vehicle borne**. In airborne transmission, the agent is carried from the source to the host suspended in air particles. Vector-borne diseases are transmitted indirectly by a live carrier, usually an arthropod, such as mosquitos, fleas, or ticks. Vehicle-borne diseases are carried by inanimate objects, such as food or water, blood, or items like handkerchiefs, bedding, and surgical instruments.

Finally, there must be a pathway into the host, a **portal of entry**, that gives the agent access to tissue where it can multiply or act. Often the agent enters the host in the same way that it left the source. This is the case with the flu virus, which leaves the source through the respiratory tract and enters a new host through the respiratory tract.

? Learning Activity

Your Disease Risk: Here, you can find out your risk of developing five of the most important diseases in the United States and get personalized tips for preventing them.

The Chain of Infection Model

This model explains the spread of a communicable disease from one host (or person) to another. The basic idea represented in the chain of infection is that individuals can break the chain (reduce the risk) at any point, thus the spread of the disease can be stopped.

Table 1. Chain of infection.

Component of the model	Definition	Preventive measures
Communicable disease	Disease caused by an infectious agent	Pasteurization, chlorination, antibiotics, disinfectants, hand washing, etc.
Human reservoir	The human being who is harboring the infectious agent	Isolation, surveillance, treatment with medications, etc.
Portal of exit	The body part through which the infectious agent is exiting from the reservoir, for example the mouth or the anus	Utilization of handkerchiefs, condoms, hair nets, insect repellents, hand washing, etc.
Transmission	The spread of the infectious agent from the reservoir to the host	Isolation, hand washing, mosquito control, sexual abstinence, condom users, etc.
Portal of entry	The body part through which the infectious agent will enter the new host, for example the skin after a mosquito bite, the mouth	Condoms, hair nets, insect repellents, hand washing, etc.
Establishment of disease in new host (susceptible person)	The host develops signs and symptoms of the new disease	Immunizations, health education, nutrition promotion; sexual abstinence, condom use, etc.

Now look at Table 1 carefully again. There are two sets of components that have some similar preventive measures. As a way of helping yourself become familiar with this chart see if you can spot which these are.

The portal of entry and exit both involve preventive measures such as hand washing, condoms, hair nets and insect repellents, while the human reservoir and transmission measures both involve isolation. Be sure you have a clear picture of the definition and prevention of each element before you continue.

With the application of such information, health education can help to create programs that are aimed at breaking the chain and reducing the risks of infection in other people.

The communicable disease model

- The **communicable diseasemodel** presents three elements; infectious agent, host and environment, as the minimal requirements for the presence and spread of a communicable disease in a population.
- The **infectious agent** is the element that must be present for the disease to occur and spread. Bacteria, viruses and parasites are examples of infectious agents.
- The **host** is any susceptible organism. Plants, animals or humans can be invaded by the infectious agent and become the host.
- The **environment** includes all other factors that either promote or prohibit disease transmission.

Communicable disease transmission occurs when a susceptible host and an infectious agent exist in an environment that allows disease transmission.

According to the communicable disease model, the role of health education and health promotion in reducing the occurrence and transmission of diseases can be brought about by specific actions.

Think of tuberculosis (TB), malaria and intestinal infections as examples, and then answer the following questions:

1. Note one way to reduce the susceptibility of hosts.
2. Note one way to destroy infectious agents.
3. Note one way to reduce the contact between the host and the agent.
4. Note one way to modify the environment so that it is not conducive for disease transmission.

You may have answered with the following examples:

1. Good nutrition will build a person's defenses against infection and reduce their risk of developing TB.
2. Cooking food properly destroys infectious agents that could cause intestinal infections.
3. Wearing a mask or holding your hand in front of your mouth while coughing will reduce the contact between the agent that causes TB, and other human beings.
4. Drying swampy and marshy areas will make the environment less easy for mosquitoes to breed in and therefore reduce the incidence of malaria.

Health risk reduction for non-communicable diseases

Both the chain of infection and communicable disease models are helpful in trying to prevent disease caused by an infectious agent. However, these models are *not* applicable to non-communicable diseases, which include many of the chronic diseases such as heart disease and cancers. Most of these diseases become apparent in people over a period of time and are not caused by a single factor, but by a combination of factors. The concept of 'caused by many factors' is often called the **multi causation disease model**. For example, it is known that heart disease is most likely to be a problem for individuals who are older, who smoke, who do not exercise, who are overweight, who have high blood pressure, who have high blood cholesterol and who have a family history of heart disease.

Note that within the list of factors you have just read there are both modifiable and non-modifiable risk factors.

? Learning Activity

Look at the list again and put an "M" against the modifiable factors and an "NM" against the non-modifiable factors.

- Are older:
- Smoke:
- Do not exercise:
- Are overweight:
- Have high blood pressure:
- Have high cholesterol:
- Have a family history of heart disease:

According to this model, health education will be useful in risk reduction and disease prevention if you can create programs that help people control as many of the multi causative risk factors as possible.

[reveal-answer q="126259"]Show Answer[/reveal-answer]
[hidden-answer a="126259"]

- Are older: NM
- Smoke: M
- Do not exercise: M
- Are overweight: M
- Have high blood pressure: M
- Have high cholesterol: M
- Have a family history of heart disease: NM

Learning Activity

Go to the Cost of Getting Sick webpage then click on the different color pies in the circle to find out the healthcare costs associated with various chronic health conditions.

Learning Activity: Leading Causes of Death

Go to 10 Leading Causes of Death, United States

- **Choose your Report Options, then click the Submit Request button.**
  - For more information about an option or a category of options, click on the underlined name or phrase.

Go to 10 Leading Causes of Injury

Sources

Source: Centers for Disease Control, EXCITE, www.cdc.gov/excite/classroom/intro_epi.htm

The Chain of Infection Model: Health Education, Advocacy and Community Mobilization Chapter, CC-BY-NC-SA, http://labspace.open.ac.uk/mod/oucontent/view.php?id=452835&printable=1

Exercise 8.1.1

1. What is epidemiology and what does it study?
2. How do epidemiologists track disease outbreaks?
3. Why is epidemiology important for public health?

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8.2: Noncommunicable Diseases and Disorders

Diseases are classified as either communicable or noncommunicable. Communicable diseases are spread to other people and they are caused by viral, bacterial, parasitic, or fungal infection. Noncommunicable diseases, also known as non-infectious diseases, are not transferred and are typically caused by heredity, deficiencies in nutrition or factors involving the environment. Some noncommunicable diseases include

- Respiratory disorders
- Diabetes
- Headaches
- Arthritis
- Skin disorders
- Neurological disorders
- Cancer
- Cardiovascular Diseases and Disorders

Respiratory Disorders

Chronic Obstructive Pulmonary Disease

- COPD, or chronic obstructive pulmonary (PULL-mun-ary) disease, is a progressive disease that makes it hard to breathe. “Progressive” means the disease gets worse over time.
- COPD can cause coughing that produces large amounts of mucus (a slimy substance), wheezing, shortness of breath, chest tightness, and other symptoms.
- Cigarette smoking is the leading cause of COPD. Most people who have COPD smoke or used to smoke. Long-term exposure to other lung irritants, such as air pollution, chemical fumes, or dust, also may contribute to COPD.
- COPD, or chronic obstructive pulmonary disease, is a major cause of disability and the third leading cause of death in the United States. More than 12 million people are currently diagnosed with COPD. An additional 12 million likely have the disease and don’t even know it.

? Learning Activity

Download this video titled *COPD Learn More Breathe Better by clicking on Windows media or Quicktime below.*

- Windows media or Quicktime
- Transcript

Profiling the personal experiences of three people diagnosed with COPD, this video answers basic questions about the disease and its risk factors, and demonstrates how real people took steps to manage the disease and breathe easier.

- Could you identify with any of the people in this video?
- What seems to be most helpful to these folks when it comes to managing their COPD?
- What did you learn that you didn’t already know before watching this video?

Overview

To understand COPD, it helps to understand how the lungs work. The air that you breathe goes down your windpipe into tubes in your lungs called bronchial tubes or airways.

The airways and air sacs are elastic (stretchy). When you breathe in, each air sac fills up with air like a small balloon. When you breathe out, the air sacs deflate and the air goes out.

In COPD, less air flows in and out of the airways because of one or more of the following:

- The airways and air sacs lose their elastic quality.
- The walls between many of the air sacs are destroyed.
- The walls of the airways become thick and inflamed.

- The airways make more mucus than usual, which tends to clog them.

In the United States, the term “COPD” includes two main conditions—emphysema and chronic bronchitis.

In emphysema, the walls between many of the air sacs are damaged, causing them to lose their shape and become floppy. This damage also can destroy the walls of the air sacs, leading to fewer and larger air sacs instead of many tiny ones. If this happens, the amount of gas exchange in the lungs is reduced.

In chronic bronchitis, the lining of the airways is constantly irritated and inflamed. This causes the lining to thicken. Lots of thick mucus forms in the airways, making it hard to breathe. Most people who have COPD have both emphysema and chronic obstructive bronchitis. Thus, the general term “COPD” is more accurate.

Outlook

- COPD is a major cause of disability, and it’s the third leading cause of death in the United States. More than 12 million people are currently diagnosed with COPD. Many more people may have the disease and not even know it.
- COPD develops slowly. Symptoms often worsen over time and can limit your ability to do routine activities. Severe COPD may prevent you from doing even basic activities like walking, cooking, or taking care of yourself.
- Most of the time, COPD is diagnosed in middle-aged or older people. The disease isn’t passed from person to person—you can’t catch it from someone else.
- COPD has no cure yet, and doctors don’t know how to reverse the damage to the airways and lungs. However, treatments and lifestyle changes can help you feel better, stay more active, and slow the progress of the disease.

How Can COPD Be Prevented?

You can take steps to prevent COPD before it starts. If you already have COPD, you can take steps to prevent complications and slow the progress of the disease.

Prevent COPD Before It Starts

The best way to prevent COPD is to not start smoking or to quit smoking. Smoking is the leading cause of COPD.

? Learning Activity

Take an ungraded quiz about COPD.

Test your knowledge about the causes and symptoms of COPD. Learn how the disease affects the lungs and how you can prevent its complications.

Chronic Bronchitis

Bronchitis is an inflammation of the bronchial tubes, the airways that carry air to your lungs. It causes a cough that often brings up mucus, as well as shortness of breath, wheezing, and chest tightness. There are two main types of bronchitis: acute and chronic.

Chronic bronchitis is one type of COPD (chronic obstructive pulmonary disease). The inflamed bronchi produce a lot of mucus. This leads to cough and difficulty getting air in and out of the lungs. Cigarette smoking is the most common cause. Breathing in other fumes and dusts over a long period of time may also cause chronic bronchitis. Treatment will help your symptoms, but chronic bronchitis is a long-term condition that keeps coming back or never goes away completely.

Emphysema

Emphysema is a type of chronic obstructive pulmonary disease (COPD) involving damage to the air sacs (alveoli) in the lungs. As a result, your body does not get the oxygen it needs. Emphysema makes it hard to catch your breath. You may also have a chronic cough and have trouble breathing during exercise.

The most common cause is cigarette smoking. If you smoke, quitting can help prevent you from getting the disease. If you already have emphysema, not smoking might keep it from getting worse. Treatment is based on whether your symptoms are mild, moderate or severe. Treatments include inhalers, oxygen, medications and sometimes surgery to relieve symptoms and prevent complications.

Asthma

Asthma is a chronic lung disease that inflames and narrows the airways, making it hard to breathe. The disease affects people of all ages, but it most often starts in childhood. People who have asthma may wheeze, cough, feel short of breath, or have chest tightness.

Asthma can't be cured, but it can be controlled. People who have asthma, or those who have children with asthma, can take an active role in their treatment. For example, they can work with their health care providers to create an asthma action plan. This plan gives guidance on taking medicines properly, avoiding asthma triggers, tracking levels of asthma control, responding to worsening symptoms, and seeking emergency care when needed. When asthma is well controlled, most people who have the disease are able to live normal, active lives.

> For more information about living with and managing asthma, go to the Health Topics Asthma article.

Diabetes

Diabetes is a disease in which your blood glucose, or sugar, levels are too high. Glucose comes from the foods you eat. Insulin is a hormone that helps the glucose get into your cells to give them energy. With Type 1 diabetes, your body does not make insulin. With Type 2 diabetes, the more common type, your body does not make or use insulin well. Without enough insulin, the glucose stays in your blood.

Over time, having too much glucose in your blood can cause serious problems. It can damage your eyes, kidneys, and nerves. Diabetes can also cause heart disease, stroke and even the need to remove a limb. Pregnant women can also get diabetes, called gestational diabetes.

A blood test can show if you have diabetes. Exercise, weight control and sticking to your meal plan can help control your diabetes. You should also monitor your glucose level and take medicine if prescribed.

Diabetes means your blood glucose, or blood sugar, is too high. With Type 1 diabetes, your pancreas does not make insulin. Insulin is a hormone that helps glucose get into your cells to give them energy. Without insulin, too much glucose stays in your blood. Over time, high blood glucose can lead to serious problems with your heart, eyes, kidneys, nerves, and gums and teeth.

Type 1 diabetes happens most often in children and young adults but can appear at any age. Symptoms may include

- Being very thirsty
- Urinating often
- Feeling very hungry or tired
- Losing weight without trying
- Having sores that heal slowly
- Having dry, itchy skin
- Losing the feeling in your feet or having tingling in your feet
- Having blurry eyesight

What are the most important things to do to prevent diabetes?

The Diabetes Prevention Program (DPP), a major federally funded study of 3,234 people at high risk for diabetes, showed that people can delay and possibly prevent the disease by losing a small amount of weight (5 to 7 percent of total body weight) through 30 minutes of physical activity 5 days a week and healthier eating.

What are the risk factors which increase the likelihood of developing diabetes?

- Being overweight or obese.
- Having a parent, brother, or sister with diabetes.
- Being African American, American Indian, Asian American, Pacific Islander, or Hispanic American/Latino heritage.
- Having a prior history of gestational diabetes or birth of at least one baby weighing more than 9 pounds.
- Having high blood pressure measuring 140/90 or higher.
- Having abnormal cholesterol with HDL ("good") cholesterol is 35 or lower, or triglyceride level is 250 or higher.

- Being physically inactive—exercising fewer than three times a week.

How does body weight affect the likelihood of developing diabetes?

Being overweight or obese is a leading risk factor for type 2 diabetes. Being overweight can keep your body from making and using insulin properly, and can also cause high blood pressure. The Diabetes Prevention Program (DPP), a major federally funded study of 3,234 people at high risk for diabetes, showed that moderate diet and exercise of about 30 minutes or more, 5 or more days per week, or of 150 or more minutes per week, resulting in a 5% to 7% weight loss can delay and possibly prevent type 2 diabetes.

Headache

Oh my aching head! Nearly everyone has had a headache. The most common type of headache is a tension headache. Tension headaches are due to tight muscles in your shoulders, neck, scalp and jaw. They are often related to stress, depression or anxiety. You are more likely to get tension headaches if you work too much, don't get enough sleep, miss meals or use alcohol.

Other common types of headaches include migraines, cluster headaches and sinus headaches. Most people can feel much better by making lifestyle changes, learning ways to relax and taking pain relievers.

Headaches can have many causes, but serious causes of headaches are rare. Sometimes headaches warn of a more serious disorder. Let your health care provider know if you have sudden, severe headaches. Get medical help right away if you have a headache after a blow to your head, or if you have a headache along with a stiff neck, fever, confusion, loss of consciousness or pain in the eye or ear.

A migraine is a very painful type of headache. People who get migraines often describe the pain as pulsing or throbbing in one area of the head. During migraines, people are very sensitive to light and sound. They may also become nauseated and vomit.

Migraine is three times more common in women than in men. Some people can tell when they are about to have a migraine because they see flashing lights or zigzag lines or they temporarily lose their vision.

Many things can trigger a migraine. These include

- Stress
- Lack of food or sleep
- Exposure to light
- Hormonal changes (in women)

Doctors used to believe migraines were linked to the opening and narrowing of blood vessels in the head. Now they believe the cause is related to genes that control the activity of some brain cells. Medicines can help prevent migraine attacks or help relieve symptoms of attacks when they happen. For many people, treatments to relieve stress can also help.

Arthritis

If you feel pain and stiffness in your body or have trouble moving around, you might have arthritis. Most kinds of arthritis cause pain and swelling in your joints. Joints are places where two bones meet, such as your elbow or knee. Over time, a swollen joint can become severely damaged. Some kinds of arthritis can also cause problems in your organs, such as your eyes or skin.

One type of arthritis, osteoarthritis, is often related to aging or to an injury. Other types occur when your immune system, which normally protects your body from infection, attacks your body's own tissues. Rheumatoid arthritis is the most common form of this kind of arthritis. Juvenile rheumatoid arthritis is a form of the disease that happens in children. Infectious arthritis is an infection that has spread from another part of the body to the joint.

Osteoarthritis is the most common form of arthritis. It causes pain, swelling and reduced motion in your joints. It can occur in any joint, but usually it affects your hands, knees, hips or spine.

Osteoarthritis breaks down the cartilage in your joints. Cartilage is the slippery tissue that covers the ends of bones in a joint. Healthy cartilage absorbs the shock of movement. When you lose cartilage, your bones rub together. Over time, this rubbing can permanently damage the joint. Factors that may cause osteoarthritis include

- Being overweight
- Getting older

- Injuring a joint

Therapies that manage osteoarthritis pain and improve function include exercise, weight control, rest, pain relief, alternative therapies, and surgery.

Skin Disorders

Did you know that your skin is the largest organ of your body? It is, in terms of both weight, between 6 and 9 pounds, and surface area, about 2 square yards. Your skin separates the inside of your body from the outside world. Skin:

- Protects you from bacteria and viruses that can cause infections
- Helps you sense the outside world, such as whether it is hot or cold, wet or dry
- Regulates your body temperature

Conditions that irritate, clog or inflame your skin can cause symptoms such as redness, swelling, burning and itching. Allergies, irritants, your genetic makeup and certain diseases and immune system problems can cause dermatitis, hives and other skin conditions. Many skin problems, such as acne, also affect your appearance.

Dermatitis

A rash is an area of irritated or swollen skin. It might be red and itchy, bumpy, scaly, crusty or blistered. Rashes are a symptom of many different medical conditions. Things that can cause a rash include other diseases, irritating substances, allergies, and your genetic makeup.

Contact dermatitis is a common cause of rashes. It causes redness, itching and burning where you have touched an irritant, such as a chemical, or something you are allergic to, like poison ivy.

Some rashes develop immediately. Others form over several days. If you scratch your rash, it might take longer to heal. The treatment for a rash usually depends on its cause. Options include moisturizers, lotions, baths, cortisone creams that relieve swelling, and antihistamines, which relieve itching.

Hives

Hives are red and sometimes itchy bumps on your skin. An allergic reaction to a drug or food usually causes them. Allergic reactions cause your body to release chemicals that can make your skin swell up in hives. People who have other allergies are more likely to get hives than other people. Other causes include infections and stress.

Hives are very common. They usually go away on their own, but if you have a serious case, you might need medicine or a shot. In rare cases, allergic reactions can cause a dangerous swelling in your airways, making it hard to breathe – which is a medical emergency.

Acne

Acne is a common skin disease that causes pimples. Pimples form when hair follicles under your skin clog up. Most pimples form on the face, neck, back, chest and shoulders. Anyone can get acne, but it is common in teenagers and young adults. It is not serious, but it can cause scars.

No one knows exactly what causes acne. Hormone changes, such as those during the teenage years and pregnancy, probably play a role. There are many myths about what causes acne. Chocolate and greasy foods are often blamed, but there is little evidence that foods have much effect on acne in most people. Another common myth is that dirty skin causes acne; however, blackheads and pimples are not caused by dirt. Stress doesn't cause acne, but stress can make it worse.

If you have acne

- Clean your skin gently
- Try not to touch your skin
- Avoid the sun

Treatments for acne include medicines and creams.

Scabies

Scabies is an itchy skin condition caused by the microscopic mite *Sarcoptes scabei*. It is common all over the world, and it affects people of all races and social classes. Scabies spreads quickly in crowded conditions where there is frequent skin-to-skin contact between people. Hospitals, child-care centers and nursing homes are examples. Scabies can easily infect sex partners and other household members. Sharing clothes, towels, and bedding can also spread scabies. You cannot get scabies from a pet. Pets get a different mite infection called mange.

Symptoms are

- Pimple-like irritations or a rash
- Intense itching, especially at night
- Sores caused by scratching

Several lotions are available to treat scabies. The infected person's clothes, bedding and towels should be washed in hot water and dried in a hot dryer.

Psoriasis

Psoriasis is a skin disease that causes itchy or sore patches of thick, red skin with silvery scales. You usually get them on your elbows, knees, scalp, back, face, palms and feet, but they can show up on other parts of your body. A problem with your immune system causes psoriasis. In a process called cell turnover, skin cells that grow deep in your skin rise to the surface. Normally, this takes a month. In psoriasis, it happens in just days because your cells rise too fast.

Psoriasis can last a long time, even a lifetime. Symptoms come and go. Things that make them worse include

- Infections
- Stress
- Dry skin
- Certain medicines

Psoriasis usually occurs in adults. It sometimes runs in families. Treatments include creams, medications and light therapy.

Neurological Disorders

Neurological disorders include:

- Diseases caused by faulty genes, such as Huntington's disease and muscular dystrophy
- Problems with the way the nervous system develops, such as spina bifida
- Degenerative diseases, where nerve cells are damaged or die, such as Parkinson's disease and Alzheimer's disease
- Injuries to the spinal cord and brain
- Seizure disorders, such as epilepsy
- Cancer, such as brain tumors
- Meningitis

Huntington's Disease

Huntington's disease (HD) is an inherited disease that causes certain nerve cells in the brain to waste away. People are born with the defective gene, but symptoms usually don't appear until middle age. Early symptoms of HD may include uncontrolled movements, clumsiness or balance problems. Later, HD can take away the ability to walk, talk or swallow. Some people stop recognizing family members. Others are aware of their environment and are able to express emotions. If one of your parents has Huntington's disease, you have a 50-50 chance of getting it. A blood test can tell if you have the HD gene and will develop the disease. Genetic counseling can help you weigh the risks and benefits of taking the test. There is no cure. Medicines can help manage some of the symptoms, but cannot slow down or stop the disease.

Muscular Dystrophy

Muscular dystrophy (MD) refers to a group of more than 30 inherited diseases that cause muscle weakness and muscle loss. Some forms of MD appear in infancy or childhood, while others may not appear until middle age or later. The different muscular

dystrophies vary in who they affect and the symptoms. All forms of MD grow worse as the person's muscles get weaker. Most people with MD eventually lose the ability to walk.
There is no cure for muscular dystrophy. Treatments include physical and speech therapy, orthopedic devices, surgery and medications. Some people with muscular dystrophy have mild cases that worsen slowly. Other cases are disabling and severe.

Spina Bifida

Spina bifida is the most common disabling birth defect in the United States. It is a type of neural tube defect, which is a problem with the spinal cord or its coverings. It happens if the fetal spinal column doesn't close completely during the first month of pregnancy. There is usually nerve damage that causes at least some paralysis of the legs. Many people with spina bifida will need assistive devices such as braces, crutches or wheelchairs. They may have learning difficulties, urinary and bowel problems or hydrocephalus, a buildup of fluid in the brain.

There is no cure. Treatments focus on the complications, and can include surgery, medicine and physiotherapy. Taking folic acid can reduce the risk of having a baby with spina bifida. It's in most multivitamins. Women who could become pregnant should take it daily.

Parkinson's Disease

Parkinson's disease is a disorder that affects nerve cells, or neurons, in a part of the brain that controls muscle movement. In Parkinson's, neurons that make a chemical called dopamine die or do not work properly. Dopamine normally sends signals that help coordinate your movements. No one knows what damages these cells. Symptoms of Parkinson's disease may include

- Trembling of hands, arms, legs, jaw and face
- Stiffness of the arms, legs and trunk
- Slowness of movement
- Poor balance and coordination

As symptoms get worse, people with the disease may have trouble walking, talking or doing simple tasks. They may also have problems such as depression, sleep problems or trouble chewing, swallowing or speaking.
Parkinson's usually begins around age 60, but it can start earlier. It is more common in men than in women. There is no cure for Parkinson's disease. A variety of medicines sometimes help symptoms dramatically.

Alzheimer's Disease

Alzheimer's disease (AD) is the most common form of dementia among older people. Dementia is a brain disorder that seriously affects a person's ability to carry out daily activities.

AD begins slowly. It first involves the parts of the brain that control thought, memory and language. People with AD may have trouble remembering things that happened recently or names of people they know. A related problem, mild cognitive impairment(MCI), causes more memory problems than normal for people of the same age. Many, but not all, people with MCI will develop AD.

In AD, over time, symptoms get worse. People may not recognize family members or have trouble speaking, reading or writing. They may forget how to brush their teeth or comb their hair. Later on, they may become anxious or aggressive, or wander away from home. Eventually, they need total care. This can cause great stress for family members who must care for them.

AD usually begins after age 60. The risk goes up as you get older. Your risk is also higher if a family member has had the disease.

No treatment can stop the disease. However, some drugs may help keep symptoms from getting worse for a limited time.

Spinal Cord Injury

Your spinal cord is the part of your nervous system that relays messages to and from your brain. It is housed inside your vertebrae, which are the bone disks that make up your spine. Normally, your vertebrae protect your spinal cord. If they don't, you can sustain a spinal cord injury. Besides injuries, the spinal cord can develop

- Tumors
- Infections such as meningitis and poliomyelitis
- Inflammatory diseases

- Autoimmune diseases
- Degenerative diseases such as amyotrophic lateral sclerosis and spinal muscular atrophy

Symptoms vary but might include pain, numbness, loss of sensation and muscle weakness. These symptoms can occur around the spinal cord, and also in other areas such as your arms and legs. Treatments vary but often include medicines and surgery.

Epilepsy

Epilepsy is a brain disorder that causes people to have recurring seizures. The seizures happen when clusters of nerve cells, or neurons, in the brain send out the wrong signals. People may have strange sensations and emotions or behave strangely. They may have violent muscle spasms or lose consciousness.

Epilepsy has many possible causes, including illness, brain injury and abnormal brain development. In many cases, the cause is unknown.

Doctors use brain scans and other tests to diagnose epilepsy. It is important to start treatment right away. There is no cure for epilepsy, but medicines can control seizures for most people. When medicines are not working well, surgery or implanted devices such as vagus nerve stimulators may help. Special diets can help some children with epilepsy.

Meningitis

Meningitis is inflammation of the thin tissue that surrounds the brain and spinal cord, called the meninges. There are several types of meningitis. The most common is viral meningitis, which you get when a virus enters the body through the nose or mouth and travels to the brain. Bacterial meningitis is rare, but can be deadly. It usually starts with bacteria that cause a cold-like infection. It can block blood vessels in the brain and lead to stroke and brain damage. It can also harm other organs. Pneumococcal infections and meningococcal infections can cause bacterial meningitis.

Anyone can get meningitis, but it is more common in people whose bodies have trouble fighting infections. Meningitis can progress rapidly. You should seek medical care quickly if you have

- A sudden fever
- A severe headache
- A stiff neck

Early treatment can help prevent serious problems, including death. Vaccines can prevent some of the bacterial infections that cause meningitis. Parents of adolescents and students living in college dorms should talk to a doctor about the vaccination.

? Learning Activity: What disease are you most afraid to get?

Click on Most Feared Diseases to compare your answer with others.

Sources

Chronic Bronchitis: *NIH, National Heart, Lung, and Blood Institute via MedlinePlus.gov*

Emphysema *: NIH, National Heart, Lung, and Blood Institute via MedlinePlus.gov*

Diabetes *: NIH: National Institute of Diabetes and Digestive and Kidney Diseases via MedlinePlus*

What are the most important things to do to prevent diabetes?: Prevent Diabetes, Centers for Disease Control, www.cdc.gov/diabetes/consumer/prevent.htm

Headache *: NIH: National Institute of Neurological Disorders and Stroke via MedlinePlus.gov*

Arthritis: *NIH: National Institute of Arthritis and Musculoskeletal and Skin Diseases via MedlinePlus.gov*

Skin Disorders: Skin Disorders, National Institute of Arthritis and Musculoskeletal and Skin Disease, NIH, http://www.nlm.nih.gov/medlineplus/skinconditions.html

Neurological Disorders: Neurological Disorders, NLM, NIH, http://www.nlm.nih.gov/medlineplus/neurologicdiseases.html

Huntington's Disease: Huntington's Disease, NIH, National Institute of Neurological Disorders and Stroke, http://www.nlm.nih.gov/medlineplus/huntingtonsdisease.html

Muscular Dystrophy: NIH: National Institute of Neurological Disorders and Stroke via MedlinePlus.gov

Spina Bifida: NIH: National Institute of Neurological Disorders and Stroke via MedlinePlus.gov

Parkinson's Disease: MedlinePlus.gov

Spinal Cord Injury: MedlinePlus.gov

Epilepsy: NIH: National Institute of Neurological Disorders and Stroke via MedlinePlus.gov

Meningitis: NIH: National Institute of Neurological Disorders and Stroke via MedlinePlus.gov

? Exercise 8.2.1

1. What are noncommunicable diseases? Give two examples.
2. Name two common risk factors for noncommunicable diseases.
3. How can lifestyle changes reduce the risk of noncommunicable diseases?

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8.3: Cardiovascular Diseases and Disorders

If you're like most people, you think that heart disease is a problem for other folks. But heart disease is the number one killer in the U.S. It is also a major cause of disability. There are many different forms of heart disease. The most common cause of heart disease is narrowing or blockage of the coronary arteries, the blood vessels that supply blood to the heart itself. This is called coronary artery disease and happens slowly over time. It's the major reason people have heart attacks.

Other kinds of heart problems may happen to the valves in the heart, or the heart may not pump well and cause heart failure. Some people are born with heart disease.

Heart disease is the leading cause of the death in the U.S. Over one quarter of all deaths are from heart disease. It is also a major cause of disability. The risk of heart disease increases as you age. You have a greater risk of heart disease if you are a man over age 45 or a woman over age 55. You also are at greater risk if you have a close family member who had heart disease at an early age.

Fortunately, there are many things you can do reduce your chances of getting heart disease. You should

- Know your blood pressure and keep it under control
- Exercise regularly
- Don't smoke
- Get tested for diabetes and if you have it, keep it under control
- Know your cholesterol and triglyceride levels and keep them under control
- Eat a lot of fruits and vegetables
- Maintain a healthy weight

The vascular system is the body's network of blood vessels. It includes the arteries, veins and capillaries that carry blood to and from the heart. Problems of the vascular system are common and can be serious. Arteries can become thick and stiff, a problem called arteriosclerosis. Blood clots can clog vessels and block blood flow to the heart or brain. Weakened blood vessels can burst, causing bleeding inside the body.

You are more likely to have vascular disease as you get older. Other factors that make vascular disease more likely include

- Family history of vascular or heart diseases
- Pregnancy
- Illness or injury
- Long periods of sitting or standing still
- Any condition that affects the heart and blood vessels, such as diabetes or high cholesterol
- Smoking
- Obesity

Losing weight, eating healthy foods, being active and not smoking can help vascular disease. Other treatments include medicines and surgery.

? Learning Activity

Complete the Risk Assessment Tool for Estimating Your 10-year Risk of Having a Heart Attack.

- Were there any surprises for you in the results?
- If so, what are you going to do about it?

Heart Disease Risk Factors

This video—presented by the National Heart, Lung, and Blood Institute, part of the National Institutes of Health—discusses the risk factors for heart disease. You can control many heart disease risk factors, but some you cannot. Taking steps to prevent heart disease is key. For example, don't smoke or quit smoking; aim for a healthy weight; be physically active; eat for heart health; know your cholesterol, blood pressure, and blood glucose numbers; and know your family's medical history.

For more information, visit the Health Topics Coronary Heart Disease Risk Factors and Heart Disease in Women articles.

Learning Activity

Watch this video about Managing High Blood Pressure With Lifestyle Changes:



This video—presented by the National Heart, Lung, and Blood Institute, part of the National Institutes of Health—shows how Kendra, the mother of a teenaged daughter, has learned to manage her high blood pressure. Before being diagnosed with high blood pressure, Kendra suffered from chronic headaches and tiredness. At a health fair sponsored by her company, Kendra learned that her blood pressure was high, which prompted her to see her doctor.

After being diagnosed with high blood pressure, Kendra made a commitment to living a healthier lifestyle. By following a healthy diet and being physically active, she lost almost 60 pounds. With the support of her girlfriend and daughter, Kendra has maintained her weight loss and continues to make lifestyle changes that allow her to live an active, happy life.

What Is Coronary Heart Disease?

Coronary heart disease (CHD), also called coronary artery disease, is a condition in which plaque (pronounced: plak) builds up inside the coronary arteries. These arteries supply oxygen-rich blood to your heart muscle.

Plaque is made up of fat, cholesterol, calcium, and other substances found in the blood. When plaque builds up in the arteries, the condition is called atherosclerosis. The buildup of plaque occurs over many years.

Atherosclerosis

Over time, plaque hardens and narrows your coronary arteries. This limits the flow of oxygen-rich blood to your heart muscle.mEventually, an area of plaque can rupture (break open). This causes a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block blood flow through a coronary artery.

Overview

If the flow of oxygen-rich blood to your heart muscle is reduced or blocked, angina or a heart attack may occur.

Angina is chest pain or discomfort. It may feel like pressure or squeezing in your chest. The pain also may occur in your shoulders, arms, neck, jaw, or back. Angina pain may even feel like indigestion.

A heart attack occurs if the flow of oxygen-rich blood to a section of heart muscle suddenly becomes blocked. If blood flow isn't restored quickly, the section of heart muscle begins to die. Without quick treatment, a heart attack can lead to serious problems and even death.

Over time, CHD can weaken the heart muscle and lead to heart failure and arrhythmias. Heart failure is a condition in which your heart can't pump enough blood to meet your body's needs. Arrhythmias are problems with the rate or rhythm of the heartbeat.

Outlook

CHD is the most common type of heart disease. In the United States, CHD is the #1 cause of death for both men and women. Lifestyle changes, medicines, and medical procedures can help prevent or treat CHD and may reduce the risk of related health problems.

? Learning Activity

Watch Living With and Managing Coronary Artery Disease:



This video—presented by the National Heart, Lung, and Blood Institute, part of the National Institutes of Health—describes coronary artery disease (CAD), its symptoms and complications, and ways to manage CAD risk factors.

CAD, also called coronary heart disease, is the leading cause of death for both men and women in the United States. CAD occurs if plaque builds up in the arteries of the heart. Plaque narrows the arteries and reduces blood flow to the heart muscle. This can lead to angina (chest pain or discomfort), a heart attack, heart failure, or arrhythmias (irregular heartbeats).

The good news is that lifestyle changes and medicines can help control CAD risk factors and prevent or delay the disease. Lifestyle changes include quitting smoking, following a healthy eating plan, maintaining a healthy weight, and being physically active.

What Causes Coronary Heart Disease?

Research suggests that coronary heart disease (CHD) starts when certain factors damage the inner layers of the coronary arteries. These factors include:

- Smoking
- High levels of certain fats and cholesterol in the blood
- High blood pressure
- High levels of sugar in the blood due to insulin resistance or diabetes

When damage occurs, your body starts a healing process. The healing may cause plaque to build up where the arteries are damaged.

The buildup of plaque in the coronary arteries may start in childhood. Over time, plaque can narrow or block some of your coronary arteries. This reduces the flow of oxygen-rich blood to your heart muscle.

Eventually, an area of plaque can rupture (break open). If this happens, blood cell fragments called platelets (PLATE-lets) will stick to the site of the injury and may clump together to form blood clots. Blood clots narrow the coronary arteries even more and worsen angina or cause a heart attack.

Who Is at Risk for Coronary Heart Disease?

In the United States, coronary heart disease (CHD) is the #1 cause of death for both men and women. Each year, more than half a million Americans die from CHD.

Certain traits, conditions, or habits—known as risk factors—may raise your risk for CHD. The more risk factors you have, the more likely you are to develop the disease.

You can control many risk factors, which may help prevent or delay CHD.

Major Risk Factors

- **Unhealthy blood cholesterol levels.** This includes high LDL cholesterol (sometimes called "bad" cholesterol) and low HDL cholesterol (sometimes called "good" cholesterol).
- **High blood pressure.** Blood pressure is considered high if it stays at or above 140/90 mmHg over time. If you have diabetes or chronic kidney disease, high blood pressure is defined as 130/80 mmHg or higher. (The mmHg is millimeters of mercury—the units used to measure blood pressure.)
- **Smoking.** Smoking can damage and tighten blood vessels, lead to unhealthy cholesterol levels, and raise blood pressure. Smoking also can limit how much oxygen reaches the body's tissues.
- **Insulin resistance.** This condition occurs if the body can't use its own insulin properly. Insulin is a hormone that helps move blood sugar into cells where it's used as an energy source. Insulin resistance may lead to diabetes.
- **Diabetes.** With this disease, the body's blood sugar level is too high because the body doesn't make enough insulin or doesn't use its insulin properly.
- **Overweight or obesity.** The terms "overweight" and "obesity" refer to body weight that's greater than what is considered healthy for a certain height.
- **Metabolic syndrome.** Metabolic syndrome is the name for a group of risk factors that raises your risk for CHD and other health problems, such as diabetes and stroke.
- **Lack of physical activity.** Lack of physical activity can worsen other risk factors for CHD, such as unhealthy blood cholesterol levels, high blood pressure, diabetes, and overweight or obesity.
- **Unhealthy diet.** An unhealthy diet can raise your risk for CHD. Foods that are high in saturated and *trans* fats, cholesterol, sodium (salt), and sugar can worsen other risk factors for CHD.
- **Older age.** As you get older, your risk for CHD increases. Genetic or lifestyle factors cause plaque to build up in your arteries as you age. By the time you're middle-aged or older, enough plaque has built up to cause signs or symptoms.
  - In men, the risk for CHD increases after age 45.
  - In women, the risk for CHD increases after age 55.
- **Family history of early heart disease.** Your risk increases if your father or a brother was diagnosed with CHD before 55 years of age, or if your mother or a sister was diagnosed with CHD before 65 years of age.

Although older age and a family history of early heart disease are risk factors, it doesn't mean that you'll develop CHD if you have one or both. Controlling other risk factors often can lessen genetic influences and prevent CHD, even in older adults.

Emerging Risk Factors

Researchers continue to study other possible risk factors for CHD:

- High levels of a protein called C-reactive protein (CRP) in the blood may raise the risk for CHD and heart attack. High levels of CRP are a sign of inflammation in the body.
- Inflammation is the body's response to injury or infection. Damage to the arteries' inner walls may trigger inflammation and help plaque grow.

Research is under way to find out whether reducing inflammation and lowering CRP levels also can reduce the risk for CHD and heart attack.

- High levels of triglycerides in the blood also may raise the risk for CHD, especially in women. Triglycerides are a type of fat.

Other Risks Related to Coronary Heart Disease

Other conditions and factors also may contribute to CHD, including:

- **Sleep apnea**. Sleep apnea is a common disorder in which you have one or more pauses in breathing or shallow breaths while you sleep. Untreated sleep apnea can increase your risk for high blood pressure, diabetes, and even a heart attack or stroke.

- **Stress**. Research shows that the most commonly reported “trigger” for a heart attack is an emotionally upsetting event, especially one involving anger.
- **Alcohol**. Heavy drinking can damage the heart muscle and worsen other risk factors for CHD. Men should have no more than two drinks containing alcohol a day. Women should have no more than one drink containing alcohol a day.
- **Preeclampsia**. This condition can develop during pregnancy. The two main signs of preeclampsia are a rise in blood pressure and excess protein in the urine. Preeclampsia is linked to an increased lifetime risk of heart disease, including CHD, heart attack, heart failure, and high blood pressure.

What Are the Signs and Symptoms of Coronary Heart Disease?

A common symptom of coronary heart disease (CHD) is angina. Angina is chest pain or discomfort that occurs if an area of your heart muscle doesn’t get enough oxygen-rich blood.

Angina may feel like pressure or squeezing in your chest. You also may feel it in your shoulders, arms, neck, jaw, or back. Angina pain may even feel like indigestion. The pain tends to get worse with activity and go away with rest. Emotional stress also can trigger the pain.

Another common symptom of CHD is shortness of breath. This symptom happens if CHD causes heart failure. When you have heart failure, your heart can’t pump enough blood to meet your body’s needs. Fluid builds up in your lungs, making it hard to breathe.

The severity of these symptoms varies. They may get more severe as the buildup of plaque continues to narrow the coronary arteries.

Signs and Symptoms of Heart Problems Related to Coronary Heart Disease

Some people who have CHD have no signs or symptoms, a condition called silent CHD. The disease may not be diagnosed until a person has signs or symptoms of a heart attack, heart failure, or an arrhythmia (an irregular heartbeat).

? Learning Activity

Watch this short video titled Heart Attack Warning Symptoms. It speaks to the 7 main symptoms of a heart attack. It uses real women’s stories to personalize the heart attack experience, and encourages women who experience these symptoms to get checked out.

This video is presented by the NIH’s National Heart, Lung, and Blood Institute.



Heart Attack

Each year over a million people in the U.S. have a heart attack. About half of them die. Many people have permanent heart damage or die because they don't get help immediately. It's important to know the symptoms of a heart attack and call 9-1-1 if someone is having them. Those symptoms include

- Chest discomfort—pressure, squeezing, or pain
- Shortness of breath
- Discomfort in the upper body—arms, shoulder, neck, back
- Nausea, vomiting, dizziness, lightheadedness, sweating

These symptoms can sometimes be different in women.

What exactly is a heart attack? Most heart attacks happen when a clot in the coronary artery blocks the supply of blood and oxygen to the heart. Often this leads to an irregular heartbeat—called an arrhythmia—that causes a severe decrease in the pumping function of the heart. A blockage that is not treated within a few hours causes the affected heart muscle to die.

Heart With Muscle Damage and a Blocked Artery

The most common heart attack symptom is chest pain or discomfort. Most heart attacks involve discomfort in the center or left side of the chest that often lasts for more than a few minutes or goes away and comes back.

The discomfort can feel like uncomfortable pressure, squeezing, fullness, or pain. The feeling can be mild or severe. Heart attack pain sometimes feels like indigestion or heartburn.

The symptoms of angina can be similar to the symptoms of a heart attack. Angina pain usually lasts for only a few minutes and goes away with rest.

Chest pain or discomfort that doesn't go away or changes from its usual pattern (for example, occurs more often or while you're resting) can be a sign of a heart attack. If you don't know whether your chest pain is angina or a heart attack, call 911.

All chest pain should be checked by a doctor.

Other common signs and symptoms of a heart attack include:

- Upper body discomfort in one or both arms, the back, neck, jaw, or upper part of the stomach
- Shortness of breath, which may occur with or before chest discomfort
- Nausea (feeling sick to your stomach), vomiting, light-headedness or fainting, or breaking out in a cold sweat
- Sleep problems, fatigue (tiredness), or lack of energy

Heart Failure

Heart failure is a condition in which your heart can't pump enough blood to meet your body's needs. Heart failure doesn't mean that your heart has stopped or is about to stop working.

The most common signs and symptoms of heart failure are shortness of breath or trouble breathing; fatigue; and swelling in the ankles, feet, legs, stomach, and veins in the neck.

All of these symptoms are the result of fluid buildup in your body. When symptoms start, you may feel tired and short of breath after routine physical effort, like climbing stairs.

Arrhythmia

An arrhythmia is a problem with the rate or rhythm of the heartbeat. When you have an arrhythmia, you may notice that your heart is skipping beats or beating too fast.

Some people describe arrhythmias as a fluttering feeling in the chest. These feelings are called palpitations. Some arrhythmias can cause your heart to suddenly stop beating. This condition is called sudden cardiac arrest (SCA). SCA usually causes death if it's not treated within minutes.

How Can Coronary Heart Disease Be Prevented or Delayed?

Taking action to control your risk factors can help prevent or delay coronary heart disease (CHD). Your risk for CHD increases with the number of risk factors you have.

- One step you can take is to adopt a healthy lifestyle. Following a healthy diet is an important part of a healthy lifestyle.
- A healthy diet includes a variety of fruits, vegetables, and whole grains. It also includes lean meats, poultry, fish, beans, and fat-free or low-fat milk or milk products. A healthy diet is low in saturated fat, *trans* fat, cholesterol, sodium (salt), and added sugar.
- If you're overweight or obese, work with your doctor to create a reasonable weight-loss plan. Controlling your weight helps you control CHD risk factors.
- Be as physically active as you can. Physical activity can improve your fitness level and your health. Talk with your doctor about what types of activity are safe for you.
- If you smoke, quit. Smoking can damage and tighten blood vessels and raise your risk for CHD. Talk with your doctor about programs and products that can help you quit. Also, try to avoid secondhand smoke.
- Know your family history of health problems related to CHD. If you or someone in your family has CHD, be sure to tell your doctor.
- If lifestyle changes aren't enough, you also may need medicines to control your CHD risk factors. Take all of your medicines as prescribed.

Angina

Angina is chest pain or discomfort you get when your heart muscle does not get enough blood. It may feel like pressure or a squeezing pain in your chest. It may feel like indigestion. You may also feel pain in your shoulders, arms, neck, jaw or back.

Angina is a symptom of coronary artery disease (CAD), the most common heart disease. CAD happens when a sticky substance called plaque builds up in the arteries that supply blood to the heart, reducing blood flow.

There are three types of angina: stable, unstable, and variant. Unstable angina is the most dangerous. It does not follow a pattern and can happen without physical exertion. It does not go away with rest or medicine. It is a sign that you could have a heart attack soon.

Not all chest pain or discomfort is angina. If you have chest pain, you should see your health care provider.

Congestive heart failure

Heart failure is a condition in which the heart can't pump enough blood throughout the body. Heart failure does not mean that your heart has stopped or is about to stop working. It means that your heart is not able to pump blood the way it should.

The weakening of the heart's pumping ability causes

- Blood and fluid to back up into the lungs
- The buildup of fluid in the feet, ankles and legs—called edema
- Tiredness and shortness of breath

The leading causes of heart failure are coronary artery disease, high blood pressure, and diabetes.

Treatment includes treating the underlying cause of your heart failure, medicines, and heart transplantation if other treatments fail.

Heart failure is a serious condition. About 5 million people in the U.S. have heart failure. It contributes to 300,000 deaths each year.

Congenital heart disorders

A congenital heart defect is a problem with the structure of the heart. It is present at birth. Congenital heart defects are the most common type of major birth defect.

A baby's heart begins to develop shortly after conception. During development, structural defects can occur. These defects can involve the walls of the heart, the valves of the heart and the arteries and veins near the heart. Congenital heart defects can disrupt the normal flow of blood through the heart. The blood flow can

- Slow down
- Go in the wrong direction or to the wrong place

- Be blocked completely

Treatment for the defect can include medicines, surgery and other medical procedures and heart transplants. The treatment depends on the type and severity of the defect and a child's age, size and general health. Today, many children born with complex heart defects grow to adulthood and lead productive lives.

Stroke

A stroke is a medical emergency. Strokes happen when blood flow to your brain stops. Within minutes, brain cells begin to die. There are two kinds of stroke. The more common kind, called ischemic stroke, is caused by a blood clot that blocks or plugs a blood vessel in the brain. The other kind, called hemorrhagic stroke, is caused by a blood vessel that breaks and bleeds into the brain. "Mini-strokes" or transient ischemic attacks (TIAs), occur when the blood supply to the brain is briefly interrupted.

Symptoms of stroke are

- Sudden numbness or weakness of the face, arm or leg (especially on one side of the body)
- Sudden confusion, trouble speaking or understanding speech
- Sudden trouble seeing in one or both eyes
- Sudden trouble walking, dizziness, loss of balance or coordination
- Sudden severe headache with no known cause

If you have any of these symptoms, you must get to a hospital quickly to begin treatment. Acute stroke therapies try to stop a stroke while it is happening by quickly dissolving the blood clot or by stopping the bleeding. Post-stroke rehabilitation helps individuals overcome disabilities that result from stroke damage. Drug therapy with blood thinners is the most common treatment for stroke.

Incidence of Stroke

Every 40 seconds, someone in the United States has a stroke. In 2008 alone, more than 133,000 Americans died from stroke—or one person every four minutes—making it the fourth leading cause of death in the United States.

A stroke, sometimes called a brain attack, occurs when a blockage stops the flow of blood to the brain or when a blood vessel in or around the brain bursts. Although many people think of stroke as a condition that affects only older adults, strokes can and do occur in people of all ages. In fact, nearly a quarter of all strokes occur in people younger than age 65.

Each year, almost 800,000 strokes occur in the United States. Strokes often lead to serious, life-changing complications that include:

- Paralysis or weakness on one side of the body.
- Problems with thinking, awareness, attention, learning, judgment, and memory.
- Problems understanding or forming speech.
- Difficulty controlling or expressing emotions.
- Numbness or strange sensations.
- Pain in the hands and feet.
- Depression.

To help protect yourself and your loved ones, learn what steps you can take to prevent a stroke and how to spot a stroke if one occurs.

Lowering Your Risk for Stroke

Demographic factors such as family history, age, sex, and race/ethnicity can all play a role in an individual's stroke risk. Regardless of your background, however, there are several things you can do to lower your chances of having a stroke.

For example, cigarette smoking contributes to one in every five strokes in the United States. Smoking—and even exposure to second-hand smoke—can thicken the blood and make it more likely to clot. Thicker blood flow can lead to increased plaque buildup in your arteries and damage to the blood vessels leading to the brain, which can cause or worsen a stroke. So, quit smoking—or better yet, don't start.

In 2011, the Department of Health and Human Services launched the Million Hearts™ initiative to prevent a million heart attacks and strokes by 2017. A primary focus is on the ABCS to prevent cardiovascular disease, including stroke, and contribute to overall

health

- **A**ppropriate Aspirin therapy
  - Ask your doctor if taking aspirin is right for you.
- **B**lood pressure control
  - Keeping your blood pressure under control reduces your risk of heart attack and stroke. More than half of the world's stroke deaths are caused by elevated blood pressure levels.
- **C**holesterol management
  - Get your cholesterol checked regularly and manage it with diet and physical activity or with medication, if needed.
- Smoking cessation
- Exercise regularly.
- Eat a healthy diet that's low in sodium.
- Maintain a healthy weight.
- Prevent or control diabetes.
- Limit your alcohol intake (fewer than two drinks per day for men, or one drink per day for women).

Recognizing the Signs of Stroke

When responding to a stroke, every minute counts. The sooner a patient receives medical treatment, the lower the risk for death or disability. If you or someone you know exhibits the following signs or symptoms, call 9-1-1 immediately:

- Numbness or weakness of the face, arm, or leg, especially on one side of the body
- Confusion, trouble speaking, or difficulty understanding
- Trouble seeing in one or both eyes
- Trouble walking, dizziness, or loss of balance and coordination
- Severe headache with no known cause

? Optional Learning Activity

Learn about CPR at Be The Beat, an online Sudden Cardiac Arrest awareness initiative to teach the simple steps that can save a life.

Sources

Source: Cardiovascular Diseases and Disorders, NLM, NIH, National Heart, Lung, and Blood Institute, http://www.nlm.nih.gov/medlineplus/heartdiseasesprevention.html

What Is Coronary Heart Disease?: Coronary Heart Disease, NHLBI, NIH, http://www.nhlbi.nih.gov/health/health-topics/topics/cad/

Heart Attack: Heart Attack, NIH, National Heart, Lung, and Blood Institute, Medline, http://www.nlm.nih.gov/medlineplus/heartattack.html

Angina: Angina, NIH, National Heart, Lung, and Blood Institute, Medline, http://www.nlm.nih.gov/medlineplus/angina.html

Congestive heart failure: Congestive Heart Failure, NIH, National Heart, Lung, and Blood Institute, Medline, http://www.nlm.nih.gov/medlineplus/heartfailure.html

Stroke: Stroke, NIH, National Institute of Neurological Disorders and Stroke via MedlinePlus.gov, http://www.nlm.nih.gov/medlineplus/stroke.html

Incidence of Stroke: Incidence of Stroke, Centers for Disease Control, http://www.cdc.gov/Features/HighBloodPressure/

Exercise 8.3.1

1. What is atherosclerosis and how does it affect the heart?
2. Name one symptom of a heart attack.
3. How does high blood pressure contribute to cardiovascular disease?

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8.4: Cancer

Cancer begins in your cells, which are the building blocks of your body. Normally, your body forms new cells as you need them, replacing old cells that die. Sometimes this process goes wrong. New cells grow even when you don't need them, and old cells don't die when they should. These extra cells can form a mass called a tumor. Tumors are abnormal growths in your body. They are made up of extra cells. Normally, old cells die, and new ones take their place. Sometimes, however, this process goes wrong. New cells form even when you don't need them, and old cells don't die when they should. When these extra cells form a mass, it is called a tumor.

Tumors can be either benign or malignant. Benign tumors aren't cancer. Malignant ones are. Benign tumors grow only in one place. They cannot spread or invade other parts of your body. Even so, they can be dangerous if they press on vital organs, such as your brain. Treatment often involves surgery. Benign tumors usually don't grow back.

Cells from malignant tumors can invade nearby tissues. They can also break away and spread to other parts of the body.

Most cancers are named for where they start. For example, lung cancer starts in the lung, and breast cancer starts in the breast. The spread of cancer from one part of the body to another is called metastasis. Symptoms and treatment depend on the cancer type and how advanced it is.

Treatments

Treatment plans may include surgery, radiation and/or chemotherapy.

Radiation is a form of energy released in particles or waves. In high doses, radiation destroys cells or keeps them from multiplying.

Radiation therapy is a cancer treatment. Its goal is to kill cancer cells and shrink tumors. Unlike cancer cells, most of your normal cells recover from radiation therapy. Doctors try to protect normal cells by limiting the radiation dosage and spreading treatment out over time. When they use radiation machines, they shield as much of your body as possible while targeting the cancer.

Normally, your cells grow and die in a controlled way. Cancer cells keep forming without control. Chemotherapy is drug therapy that can kill these cells or stop them from multiplying. However, it can also harm healthy cells, which causes side effects.

During chemotherapy you may have no side effects or just a few. The kinds of side effects you have depend on the type and dose of chemotherapy you get. Side effects vary, but common ones are nausea, vomiting, tiredness, pain and hair loss. Healthy cells usually recover after chemotherapy, so most side effects gradually go away.

Your course of therapy will depend on the cancer type, the chemotherapy drugs used, the treatment goal and how your body responds. You may get treatment every day, every week or every month. You may have breaks between treatments so that your body has a chance to build new healthy cells. You might take the drugs by mouth, in a shot or intravenously.

What Is Risk?

Do you know the four types of risk factors that affect your cancer risk? Or that your level of contact with these risk factors can affect your risk? This section explains the concept of risk and lets you test your knowledge of the subject. Go to this website to understand cancer risk factors.

Can I Lower My Risk?

Here you can explore your risk for 6 cancers: breast, cervical, colon, lung, prostate, and skin. What are the risk factors for each of these cancers? Which risk factors apply to you? And what can you do to reduce your risk?

- Breast Cancer
- Cervical Cancer
- Colorectal Cancer
- Lung Cancer
- Prostate Cancer
- Skin Cancer

Is This News Story True?

You've heard the stories about things like cell phones and deodorants causing cancer. How do you decide if the stories you find in the media are accurate? It is important to analyze what you read in the paper, see on television, hear on the radio, or find on the Internet. A good analysis will help you determine whether the information is likely to be accurate. Below is a list of questions to consider when you hear about new cancer research studies.

- Who is reporting the results?
  - Is the newspaper, radio or TV station, or Internet site a reliable source of medical news? You might want to talk to your health care provider to help you judge the reliability of the source.
- Was the study based in the laboratory, on animals, or on people?
  - The results of research on people are more likely to be meaningful to you.
- How large is the study?
  - In general, when it comes to understanding medical risks, the larger the study the more valid the data will be for the general population.
- Does it include people like you?
  - Check to see if some of the people in the study were the same age, sex, ethnic background, income group as yourself and had the same health concerns.
- Are the results presented in an easy-to-understand way?
  - They should use absolute risk, relative risk, or some other easy-to-understand number.
- Does the report clearly tell what behavior or medical treatment was studied?
  - Information about the study should include what behavior or medical treatment was being studied. It should also include what outcomes, such as lower cancer risk or increased detection, were measured in the study.
- What are other possible explanations for the study results?
  - Researchers should discuss other possible explanations for the results. These may include other risk factors or problems with the research.
- Where was the research done?
  - Scientists at a medical school or large hospital, for example, might be better able to conduct complex experiments or have more experience.
- Has the study been published in a peer-reviewed journal?
  - Medical journals use a peer review process to help ensure the quality of the research. (Peer review is an appraisal of research against accepted standards by professionals in the field.)

Skin Cancer

Skin cancer is the most common form of cancer in the United States. The two most common types of skin cancer—basal cell and squamous cell carcinomas—are highly curable. However, melanoma, the third most common skin cancer, is more dangerous. About 65%–90% of melanomas are caused by exposure to ultraviolet (UV) light.

Each year, more than 68,000 Americans are diagnosed with melanoma, and another 48,000 are diagnosed with an early form of the disease that involves only the top layer of skin. Also, more than 2 million people are treated for basal cell or squamous cell skin cancer each year. Basal cell skin cancer is several times more common than squamous cell skin cancer.

Skin cancers are named for the type of cells that become malignant (cancer). The three most common types are:

- **Melanoma**: Melanoma begins in melanocytes (pigment cells). Most melanocytes are in the skin. See the picture of a melanocyte and other skin cells. Melanoma can occur on any skin surface. In men, it's often found on the skin on the head, on the neck, or between the shoulders and the hips. In women, it's often found on the skin on the lower legs or between the shoulders and the hips.Melanoma is rare in people with dark skin. When it does develop in people with dark skin, it's usually found under the fingernails, under the toenails, on the palms of the hands, or on the soles of the feet.

- **Basal cell skin cancer**: Basal cell skin cancer begins in the basal cell layer of the skin. It usually occurs in places that have been in the sun. For example, the face is the most common place to find basal cell skin cancer.In people with fair skin, basal cell skin cancer is the most common type of skin cancer.
- **Squamous cell skin cancer**: Squamous cell skin cancer begins in squamous cells. In people with dark skin, squamous cell skin cancer is the most common type of skin cancer, and it's usually found in places that are not in the sun, such as the legs or feet.However, in people with fair skin, squamous cell skin cancer usually occurs on parts of the skin that have been in the sun, such as the head, face, ears, and neck.

Unlike moles, skin cancer can invade the normal tissue nearby. Also, skin cancer can spread throughout the body. Melanoma is more likely than other skin cancers to spread to other parts of the body. Squamous cell skin cancer sometimes spreads to other parts of the body, but basal cell skin cancer rarely does.

When skin cancer cells do spread, they break away from the original growth and enter blood vessels or lymph vessels. The cancer cells may be found in nearby lymph nodes. The cancer cells can also spread to other tissues and attach there to form new tumors that may damage those tissues. The spread of cancer is called metastasis.

Symptoms of Melanoma

Often the first sign of melanoma is a change in the shape, color, size, or feel of an existing mole. Melanoma may also appear as a new mole. Thinking of "ABCDE" can help you remember what to look for:

- **Asymmetry**: The shape of one half does not match the other half.
- **Border that is irregular**: The edges are often ragged, notched, or blurred in outline. The pigment may spread into the surrounding skin.
- **Color that is uneven**: Shades of black, brown, and tan may be present. Areas of white, gray, red, pink, or blue may also be seen.
- **Diameter**: There is a change in size, usually an increase. Melanomas can be tiny, but most are larger than the size of a pea (larger than 6 millimeters or about 1/4 inch).
- **Evolving**: The mole has changed over the past few weeks or months.

Melanomas can vary greatly in how they look. Many show all of the ABCDE features. However, some may show changes or abnormal areas in only one or two of the ABCDE features.

In more advanced melanoma, the texture of the mole may change. The skin on the surface may break down and look scraped. It may become hard or lumpy. The surface may ooze or bleed. Sometimes the melanoma is itchy, tender, or painful.

Visit the National Cancer Institute's Symptoms of Melanoma webpage to view photos of an asymmetric melanoma and a dysplastic nevus.

A change on the skin is the most common sign of skin cancer. This may be a new growth, a sore that doesn't heal, or a change in an old growth. Not all skin cancers look the same. Usually, skin cancer is not painful.

Common symptoms of basal cell or squamous cell skin cancer include:

- A lump that is small, smooth, shiny, pale, or waxy
- A lump that is firm and red
- A sore or lump that bleeds or develops a crust or a scab
- A flat red spot that is rough, dry, or scaly and may become itchy or tender
- A red or brown patch that is rough and scaly

Risk Factors

When you're told that you have skin cancer, it's natural to wonder what may have caused the disease. The main risk factor for skin cancer is exposure to sunlight (UV radiation), but there are also other risk factors. A risk factor is something that may increase the chance of getting a disease.

People with certain risk factors are more likely than others to develop skin cancer. Some risk factors vary for the different types of skin cancer.

Risks for Any Type of Skin Cancer

Studies have shown that the following are risk factors for the three most common types of skin cancer:

- **Sunlight**: Sunlight is a source of **UV radiation**. It's the most important risk factor for any type of skin cancer. The sun's rays cause skin damage that can lead to cancer.
- **Severe, blistering sunburns**: People who have had at least one severe, blistering sunburn are at increased risk of skin cancer. Although people who burn easily are more likely to have had sunburns as a child, sunburns during adulthood also increase the risk of skin cancer.
- **Lifetime sun exposure**: The total amount of sun exposure over a lifetime is a risk factor for skin cancer.
- **Tanning**: Although a tan slightly lowers the risk of sunburn, even people who tan well without sunburning have a higher risk of skin cancer because of more lifetime sun exposure.

Sunlight can be reflected by sand, water, snow, ice, and pavement. The sun's rays can get through clouds, windshields, windows, and light clothing.

In the United States, skin cancer is more common where the sun is strong. For example, more people in Texas than Minnesota get skin cancer. Also, the sun is stronger at higher elevations, such as in the mountains.
Doctors encourage people to limit their exposure to sunlight.

- **Sunlamps and tanning booths**: Artificial sources of UV radiation, such as sunlamps and tanning booths, can cause skin damage and skin cancer. Health care providers strongly encourage people, especially young people, to avoid using sunlamps and tanning booths. The risk of skin cancer is greatly increased by using sunlamps and tanning booths before age 30.
- **Personal history**: People who have had melanoma have an increased risk of developing other melanomas. Also, people who have had basal cell or squamous cell skin cancer have an increased risk of developing another skin cancer of any type.
- **Family history**: Melanoma sometimes runs in families. Having two or more close relatives (mother, father, sister, brother, or child) who have had this disease is a risk factor for developing melanoma.
- **Skin that burns easily**: Having fair (pale) skin that burns in the sun easily, blue or gray eyes, red or blond hair, or many freckles increases the risk of skin cancer.
- **Certain medical conditions or medicines**: Medical conditions or medicines (such as some antibiotics, hormones, or antidepressants) that make your skin more sensitive to the sun increase the risk of skin cancer. Also, medical conditions or medicines that suppress the immune system increase the risk of skin cancer.

Other Risk Factors for Melanoma

The following risk factors increase the risk of melanoma:

- **Dysplastic nevus**: A dysplastic nevus is a type of mole that looks different from a common mole. A dysplastic nevus may be bigger than a common mole, and its color, surface, and border may be different. It's usually wider than a pea and may be longer than a peanut. A dysplastic nevus can have a mixture of several colors, from pink to dark brown. Usually, it's flat with a smooth, slightly scaly or pebbly surface, and it has an irregular edge that may fade into the surrounding skin. A dysplastic nevus is more likely than a common mole to turn into cancer. However, most do not change into melanoma. A doctor will remove a dysplastic nevus if it looks like it might have changed into melanoma.
- **More than 50 common moles**: Usually, a common mole is smaller than a pea, has an even color (pink, tan, or brown), and is round or oval with a smooth surface. Having many common moles increases the risk of developing melanoma.

Symptoms of Melanoma

Often the first sign of melanoma is a change in the shape, color, size, or feel of an existing mole. Melanoma may also appear as a new mole. Thinking of "ABCDE" can help you remember what to look for:

- **Asymmetry**: The shape of one half does not match the other half.
- **Border that is irregular**: The edges are often ragged, notched, or blurred in outline. The pigment may spread into the surrounding skin.
- **Color that is uneven**: Shades of black, brown, and tan may be present. Areas of white, gray, red, pink, or blue may also be seen.

- **Diameter**: There is a change in size, usually an increase. Melanomas can be tiny, but most are larger than the size of a pea (larger than 6 millimeters or about 1/4 inch).
- **Evolving**: The mole has changed over the past few weeks or months.

Melanomas can vary greatly in how they look. Many show all of the ABCDE features. However, some may show changes or abnormal areas in only one or two of the ABCDE features.

In more advanced melanoma, the texture of the mole may change. The skin on the surface may break down and look scraped. It may become hard or lumpy. The surface may ooze or bleed. Sometimes the melanoma is itchy, tender, or painful.

How To Check Your Skin

Your doctor or nurse may suggest that you do a regular skin self-exam to check for the development of a new skin cancer.

The best time to do this exam is after a shower or bath. Check your skin in a room with plenty of light. Use a full-length mirror and a hand-held mirror.

It's best to begin by learning where your birthmarks, moles, and other marks are and their usual look and feel.

Check for anything new:

- A new mole (that looks different from your other moles)
- A new red or darker color flaky patch that may be a little raised
- A new flesh-colored firm bump
- A change in the size, shape, color, or feel of a mole
- A sore that doesn't heal

Check yourself from head to toe:

- Look at your face, neck, ears, and scalp. You may want to use a comb or a blow dryer to move your hair so that you can see better. You also may want to have a relative or friend check through your hair. It may be hard to check your scalp by yourself.
- Look at the front and back of your body in the mirror. Then, raise your arms and look at your left and right sides.
- Bend your elbows. Look carefully at your fingernails, palms, forearms (including the undersides), and upper arms.
- Examine the back, front, and sides of your legs. Also look around your genital area and between your buttocks.
- Sit and closely examine your feet, including your toenails, your soles, and the spaces between your toes.

By checking your skin regularly, you'll learn what is normal for you. It may be helpful to record the dates of your skin exams and to write notes about the way your skin looks. If your doctor has taken photos of your skin, you can compare your skin to the photos to help check for changes. If you find anything unusual, see your doctor.

? Learning Activity

Check out your risk of melanoma using the Melanoma Cancer Risk Assessment Tool.

This is an interactive tool that allows doctors to estimate a person's absolute risk of developing invasive melanoma (skin cancer) over the next 5 years for people age 20 to 70 years. The tool allows doctors to identify individuals at higher risk of melanoma in order to plan appropriate screening interventions with them.

What is breast cancer?

Cancer is a disease in which cells in the body grow out of control. When cancer starts in the breast, it is called breast cancer. The breast is made up of three main parts: glands, ducts, and connective tissue. Sometimes, breast cells become abnormal and grow faster than normal cells. These extra cells form a mass called a tumor. Some tumors are "benign," or not cancerous. Other tumors are "malignant," meaning they are cancerous and have the ability to spread to other parts of the breast and body and disrupt normal functions in those areas.
All women are at risk for breast cancer.

Men can also get breast cancer, but this is rare. Breast cancer is the second most common cancer in women. Among Hispanic women, it is the most common cause of cancer deaths, and it is the second most common cause of cancer deaths among white,

black, Asian or Pacific Islander, and American Indian or Alaska Native women. Although more white women get breast cancer, more black women die from it. Each year, approximately 190,000 women are diagnosed with breast cancer and 40,000 women die from the disease.

What puts me at greater risk?

Several factors may affect your risk of developing breast cancer, including:

- Getting older
- Not having children, or having your first child later in life
- Starting your first menstrual period at an early age
- Beginning menopause at a late age
- Having a personal history of breast cancer or certain benign breast diseases, such as atypical ductal hyperplasia
- Having close family relatives (such as a mother, sister, father, or daughter) who have had breast cancer
- Having a genetic condition, such as certain mutations in your BRCA1 or BRCA2 genes
- Having been treated with radiation therapy to the breast or chest
- Being overweight, particularly after menopause
- Using hormone replacement therapy for a long time
- Using oral contraceptives
- Drinking alcohol
- Being physically inactive

What are the symptoms?

When breast cancer starts out, it is too small to feel and does not cause signs and symptoms. As it grows, however, breast cancer can cause changes in how the breast looks or feels. Symptoms may include:

- A new lump in the breast
- A lump that has changed
- A change in the size or shape of the breast
- Pain in the breast or nipple that does not go away
- Flaky, red, or swollen skin anywhere on the breast
- A nipple that is very tender or that turns inward
- Blood or any other type of fluid coming from the nipple that is not milk when nursing a baby

These symptoms may be caused by something other than cancer, but the only way to know is to get checked.

How can I find out if I have breast cancer?

Women should begin to have routine screenings for breast cancer at the age of 50. Women under the age of 50 should talk to their health care provider about when and how often they should be screened. If you have any risk factors or symptoms of breast cancer, talk to a doctor, nurse, or health care professional.

A mammogram is the best test for finding breast cancer early. It is a series of X-ray pictures of the breast that allow doctors to look for early signs of breast cancer, sometimes up to three years before it can be felt. If your mammogram is abnormal or more tests are required, do not panic. An abnormal mammogram does not always mean you have cancer. It does mean that you will need to have some additional X-rays or other tests before your doctor can be sure. Other tests may include an ultrasound (picture taken of the breast using sound waves) or a biopsy (removing tissue samples to be looked at closely under a microscope). You may be referred to a breast specialist or a surgeon, because these doctors are experts in diagnosing breast problems. Treatment is most effective when breast cancer is found early, and many women go on to live long and healthy lives. How can I prevent breast cancer?

Scientists are studying how best to prevent breast cancer. There are things you can do to help lower your risk of getting breast cancer, including:

- Staying physically active with regular exercise
- Maintaining a healthy weight
- Avoiding hormone replacement therapy (HRT), or finding out the risks and benefits of HRT and if it is right for you

- Limiting the amount of alcohol that you drink

Learning Activity

Check out your risk of getting breast cancer using The Breast Cancer Risk Assessment Tool.

This is an interactive tool that allows doctors to estimate a woman's absolute risk of developing invasive breast cancer over the next 5 years for women age 35 to 90 years (lifetime risk) based on the woman's age and the risk factor information provided.

Colorectal Cancer

Colorectal cancer is cancer of the rectum or colon. It's the second leading cause of cancer-related death for both men and women.

People over the age of 50 are at the highest risk for colorectal cancer. Other risk factors include:

- Growths (called polyps) inside the colon
- Family history of colorectal cancer
- Smoking
- Health conditions like Crohn's Disease
- Being African-American

Here's the good news: you can reduce your risk if you get screened for colorectal cancer starting at the age of 50. You can also reduce your risk of colorectal cancer by:

- Getting active
- Eating healthy
- Quitting smoking

Learning Activity

Check out your risk of getting colorectal cancer using the The Colorectal Cancer Risk Assessment Tool.

This is an interactive tool designed to help people and their healthcare providers make informed choices about colorectal screening. The tool uses a respondent's answers to an online questionnaire to calculate that person's 5-year, 10-year, and lifetime risk of developing colorectal cancer.

Lung Cancer

Lung cancer is one of the most common cancers in the world. It is a leading cause of cancer death in men and women in the United States. Cigarette smoking causes most lung cancers. The more cigarettes you smoke per day and the earlier you started smoking, the greater your risk of lung cancer. High levels of pollution, radiation and asbestos exposure may also increase risk.

Common symptoms of lung cancer include

- A cough that doesn't go away and gets worse over time
- Constant chest pain
- Coughing up blood
- Shortness of breath, wheezing, or hoarseness
- Repeated problems with pneumonia or bronchitis
- Swelling of the neck and face
- Loss of appetite or weight loss
- Fatigue

There are many types of lung cancer. Each type of lung cancer grows and spreads in different ways and is treated differently. Treatment also depends on the stage, or how advanced it is. Treatment may include chemotherapy, radiation and surgery.

Ovarian Cancer

The sooner ovarian cancer is found and treated, the better your chance for recovery. But ovarian cancer is hard to detect early. Many times, women with ovarian cancer have no symptoms or just mild symptoms until the disease is in an advanced stage and hard to treat. Symptoms may include:

- Heavy feeling in pelvis
- Pain in lower abdomen
- Bleeding from the vagina
- Weight gain or loss
- Abnormal periods
- Unexplained back pain that gets worse
- Gas, nausea, vomiting, or loss of appetite

Treatment is usually surgery followed by treatment with medicines called chemotherapy.

Prostate Cancer

Prostate cancer is the most common cancer in men. Ask your doctor about the potential benefits and harms of prostate cancer screening tests.

Cancer is a disease in which abnormal cells in the body grow out of control. When cancer starts in the prostate, it is called prostate cancer. The prostate is a walnut-sized organ located just below the bladder and in front of the rectum in men. It produces fluid that makes up a part of semen.

Prostate cancer is the most commonly diagnosed cancer in men, and second only to lung cancer in the number of cancer deaths. In 2007 (the most recent year for which statistics are available), 223,307 men were diagnosed with prostate cancer, and 29,093 men died from it.

Symptoms

Different people have different symptoms for prostate cancer. Some men do not have symptoms at all. Some symptoms of prostate cancer are

- Difficulty in starting urination.
- Weak or interrupted flow of urine.
- Frequent urination, especially at night.
- Difficulty in emptying the bladder completely.
- Pain or burning during urination.
- Blood in the urine or semen.
- Pain in the back, hips, or pelvis that doesn’t go away.
- Painful ejaculation.

If you have any symptoms that worry you, be sure to see your doctor right away. These symptoms may be caused by conditions other than prostate cancer.

Risk Factors

There is no way to know for sure if you will get prostate cancer. Men have a greater chance of getting prostate cancer if they are 50 years old or older, are African-American, or have a father, brother, or son who has had prostate cancer.

Screening for Prostate Cancer

Not all medical experts agree that screening for prostate cancer will save lives. Currently, there is not enough credible evidence to decide if the potential benefit of prostate cancer screening outweighs the potential risks. The potential benefit of prostate cancer screening is early detection of cancer, which may make treatment more effective. Potential risks include false positive test results (the test says you have cancer when you do not), treatment of prostate cancers that may never affect your health, and mild to serious side effects from treatment of prostate cancer.

Most organizations recommend that men discuss with their doctors the benefits and risks of prostate cancer screening. CDC supports informed decision making, which encourages men to talk with their doctors to learn the nature and risk of prostate cancer, understand the benefits and risks of the screening tests, and make decisions consistent with their preferences and values.

Tests that are commonly used to screen for prostate cancer are—

- **Digital rectal exam (DRE):** A doctor, nurse, or other health care professional places a gloved finger into the rectum to feel the size, shape, and hardness of the prostate gland.
- **Prostate specific antigen test (PSA):** PSA is a substance made by the prostate. The PSA test measures the level of PSA in the blood, which may be higher in men who have prostate cancer. However, other conditions such as an enlarged prostate, prostate infections, and certain medical procedures also may increase PSA levels.

Sources

Source: Cancer, NIH: National Cancer Institute via MedlinePlus, http://www.nlm.nih.gov/medlineplus/cancer.html

Skin Cancer: Basic Information, CDC, http://www.cdc.gov/cancer/skin/basic_info/index.htm

Skin Cancer: Skin Cancer, National Cancer Institute, http://www.cancer.gov/cancertopics/types/skin

What is breast cancer?: Breast Cancer Facts, CDC, www.cdc.gov/cancer/nbccedp/pdf/toolkit/NBCCEDP_2011_BCFacts_Gen_508.pdf

Colorectal Cancer: NIH: National Cancer Institute, http://www.nlm.nih.gov/medlineplus/lungcancer.html

Lung Cancer: Lung Cancer, NIH: National Cancer Institute, http://www.nlm.nih.gov/medlineplus/lungcancer.html

Prostate Cancer: U.S. Cancer Statistics Working Group. //United States Cancer Statistics: 1999–2007 Incidence and Mortality Web-based Report.// Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2010. Available at: http://www.cdc.gov/uscs.

? Exercise 8.4.1

1. Explain how cancer cells differ from normal cells.
2. Name two risk factors associated with cancer.
3. What is one common treatment option for cancer?

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8.5: Communicable (Infectious) Diseases

Introduction

Infectious diseases kill more people worldwide than any other single cause. Infectious diseases are caused by germs. Germs are tiny living things that are found everywhere—in air, soil, and water. You can get infected by touching germs.

There are four main kinds of germs:

- Bacteria—one-celled germs that multiply quickly and may release chemicals which can make you sick
- Viruses—capsules that contain genetic material, and use your own cells to multiply
- Fungi—primitive vegetables, like mushrooms or mildew
- Protozoa—one-celled animals that use other living things for food and a place to live

? Learning Activity

Watch this video about Infectious Diseases Then and Now:



Bacteria

Bacteria are living things that have only one cell. Under a microscope, they look like balls, rods, or spirals. They are so small that a line of 1,000 could fit across a pencil eraser. Most bacteria won't hurt you—less than 1 percent makes people sick. Many are helpful. Some bacteria help to digest food, destroy disease-causing cells and give the body needed vitamins. Bacteria are also used in making healthy foods like yogurt and cheese.
But infectious bacteria can make you ill. They reproduce quickly in your body. Many give off chemicals called toxins, which can damage tissue and make you sick. Examples of bacteria that cause infections include *Streptococcus*, *Staphylococcus*, and *E. coli*.

Antibiotics are the usual treatment. When you take antibiotics, follow the directions carefully. Each time you take antibiotics, you increase the chances that bacteria in your body will learn to resist them. Later, you could get or spread an infection that those antibiotics cannot cure.

Strep Throat

Streptococcal infections (strep for short) cause a variety of health problems. There are two types: group A and group B. Antibiotics are used to treat both.

Group A strep causes

- Strep throat—a sore, red throat, sometimes with white spots on the tonsils
- Scarlet fever—red rash on the body
- Impetigo—a skin infection
- Toxic shock syndrome
- Cellulitis and necrotizing fasciitis (flesh-eating disease)

Group B strep can cause blood infections, pneumonia and meningitis in newborns. A screening test during pregnancy can tell if you have it. If you do, I.V. antibiotics during labor can save your baby's life. Adults can also get group B strep infections, especially if they are elderly or already have health problems. Strep B can cause urinary tract infections, blood infections, skin infections and pneumonia in adults.

Tuberculosis (TB)

In developed countries, such as the United States, many people think TB is a disease of the past. TB, however, is still a leading killer of young adults worldwide. Some 2 billion people—one-third of the world's population—are thought to be infected with TB bacteria, *Mycobacterium tuberculosis* (*Mtb*).

TB is a chronic bacterial infection. It is spread through the air and usually infects the lungs, although other organs and parts of the body can be involved as well. Most people who are infected with *Mtb* harbor the bacterium without symptoms (have latent TB), but some will develop active TB disease. According to World Health Organization estimates, each year 8 million people worldwide develop active TB and nearly 2 million die.

One in 10 people who are infected with *Mtb* may develop active TB at some time in their lives. The risk of developing active disease is greatest in the first year after infection, but active disease often does not occur until many years later.

TB in the United States

In 2006, the Centers for Disease Control and Prevention (CDC) reported 13,799 cases of active TB. While the overall rate of new TB cases continues to decline in the United States since national reporting began in 1953, the annual decrease in TB cases has slowed from an average of 7.1 percent (1993–2000) to the current average of 3.8 percent (2001–2005), according to CDC. In addition to those with active TB, an estimated 10 to 15 million people in the United States have latent TB.

Minorities are affected disproportionately by TB, which occurs among foreign-born individuals nearly nine times as frequently as among people born in the United States. This is partially because they were often exposed to *Mtb* in their country of origin before moving to the United States. In 2004, a very high percentage of Asians (95 percent) and Hispanics (75 percent) who were born outside the United States were reported to have TB.

Tuberculosis (TB) is a bacterial infection caused by a germ called *Mycobacterium tuberculosis*. The bacteria usually attack the lungs, but they can also damage other parts of the body. TB spreads through the air when a person with TB of the lungs or throat coughs, sneezes or talks. If you have been exposed, you should go to your doctor for tests. You are more likely to get TB if you have a weak immune system.

Symptoms of TB in the lungs may include

- A bad cough that lasts 3 weeks or longer
- Weight loss
- Coughing up blood or mucus
- Weakness or fatigue
- Fever and chills
- Night sweats

If not treated properly, TB can be deadly. You can usually cure active TB by taking several medicines for a long period of time. People with latent TB can take medicine so that they do not develop active TB.

Viral Infections

Viruses are capsules with genetic material inside. They are very tiny, much smaller than bacteria. Viruses cause familiar infectious diseases such as the common cold, flu and warts. They also cause severe illnesses such as HIV/AIDS, smallpox and hemorrhagic fevers.

Viruses are like hijackers. They invade living, normal cells and use those cells to multiply and produce other viruses like themselves. This eventually kills the cells, which can make you sick.

Viral infections are hard to treat because viruses live inside your body's cells. They are "protected" from medicines, which usually move through your bloodstream. Antibiotics do not work for viral infections. There are a few antiviral medicines available.

Vaccines can help prevent you from getting many viral diseases.

Influenza

Flu is a respiratory infection caused by a number of viruses. The viruses pass through the air and enter your body through your nose or mouth. Between 5% and 20% of people in the U.S. get the flu each year. The flu can be serious or even deadly for elderly people, newborn babies and people with certain chronic illnesses.
Symptoms of the flu come on suddenly and are worse than those of the common cold. They may include

- Body or muscle aches
- Chills
- Cough
- Fever
- Headache
- Sore throat

Is it a cold or the flu? Colds rarely cause a fever or headaches. Flu almost never causes an upset stomach. And “stomach flu” isn’t really flu at all, but gastroenteritis.

The main way to keep from getting the flu is to get a yearly flu vaccine. If you get the flu, your health care provider may prescribe medicine to help your body fight the infection and lessen symptoms.

? Learning Activity

Watch this video:



Common Cold

Sneezing, sore throat, a stuffy nose, coughing—everyone knows the symptoms of the common cold. It is probably the most common illness. In the course of a year, people in the United States suffer 1 billion colds.
You can get a cold by touching your eyes or nose after you touch surfaces with cold germs on them. You can also inhale the germs. Symptoms usually begin 2 or 3 days after infection and last 2 to 14 days. Washing your hands and staying away from people with colds will help you avoid colds.However, do not give aspirin to children. And do not give cough medicine to children under four.

There is no cure for the common cold. For relief, try

- Getting plenty of rest
- Drinking fluids
- Gargling with warm salt water

- Using cough drops or throat sprays
- Taking over-the-counter pain or cold medicines

Hepatitis B

Hepatitis B is one type of hepatitis—a liver disease—caused by the hepatitis B virus (HBV). Hepatitis B spreads by contact with an infected person's blood, semen or other body fluid. An infected woman can give hepatitis B to her baby at birth.

If you get HBV, you may feel as if you have the flu, or you may have no symptoms at all. A blood test can tell if you have it. HBV usually gets better on its own after a few months. If it does not get better, it is called chronic HBV, which lasts a lifetime. Chronic HBV can lead to scarring of the liver, liver failure or liver cancer.
There is a vaccine for HBV. It requires three shots. All babies should get the vaccine, but older children and adults can get it too. If you travel to countries where Hepatitis B is common, you should get the vaccine.

? Learning Activity

Are you at risk for viral hepatitis? Take this quick Hepatitis Risk Assessment test to find out.

Infectious mononucleosis

Infectious mononucleosis, or "mono," is an infection caused by the Epstein-Barr virus. The virus spreads through saliva, which is why it's sometimes called "kissing disease." Mono occurs most often in 15- to 17-year-olds. However, you can get it at any age. Symptoms of mono include

- Fever
- Sore throat
- Swollen lymph glands

Sometimes you may also have a swollen spleen. Serious problems are rare.

A blood test can show if you have mono. Most people get better in two to four weeks. However, you may feel tired for a few months afterward. Treatment focuses on helping symptoms and includes medicines for pain and fever, warm salt water gargles and plenty of rest and fluids.

Fungi

If you have ever had athlete's foot or a yeast infection, you can blame a fungus. A fungus is actually a primitive vegetable. Mushrooms, mold and mildew are examples. Fungi live in air, in soil, on plants and in water. Some live in the human body. Only about half of all types of fungi are harmful.

Some fungi reproduce through tiny spores in the air. You can inhale the spores or they can land on you. As a result, fungal infections often start in the lungs or on the skin. You are more likely to get a fungal infection if you have a weakened immune system or take antibiotics.

Fungi can be difficult to kill. For skin and nail infections, you can apply medicine directly to the infected area. Oral antifungal medicines are also available for serious infections.

Yeast Infections (or Candida)

Candida is the scientific name for yeast. It is a fungus that lives almost everywhere, including in your body. Usually, your immune system keeps yeast under control. If you are sick or taking antibiotics, it can multiply and cause an infection.

Yeast infections affect different parts of the body in different ways:

- Thrush is a yeast infection that causes white patches in your mouth
- Esophagitis is thrush that spreads to your esophagus, the tube that takes food from your mouth to your stomach. Esophagitis can make it hard or painful to swallow
- Women can get vaginal yeast infections, causing itchiness, pain and discharge
- Yeast infections of the skin cause itching and rashes
- Yeast infections in your bloodstream can be life-threatening

Antifungal medicines eliminate yeast infections in most people. If you have a weak immune system, treatment might be more difficult.

Parasitic Diseases

Parasites are living things that use other living things—like your body—for food and a place to live. You can get them from contaminated food or water, a bug bite, or sexual contact. Parasitic diseases can cause mild discomfort or be deadly.

Parasites range in size from tiny, one-celled organisms called protozoa to worms that can be seen with the naked eye. Some parasitic diseases happen in the United States. Contaminated water supplies can lead to Giardia infections. Cats can transmit toxoplasmosis, which is dangerous for pregnant women. Others, like malaria, are common in other parts of the world.

If you are traveling, it's important to drink only water you know is safe. Prevention is especially important. There are no vaccines for parasitic diseases. Some medicines are available to treat parasitic infections.

Pneumonia

Pneumonia is an inflammation of the lung, usually caused by an infection. Three common causes are bacteria, viruses and fungi. You can also get pneumonia by accidentally inhaling a liquid or chemical. People most at risk are older than 65 or younger than 2 years of age, or already have health problems.

If you have pneumonia, you may have difficulty breathing and have a cough and a fever. A physical exam and history can help determine if you have pneumonia. Chest x-rays and blood tests can help determine what is wrong. Treatment depends on what made you sick. If bacteria are the cause, antibiotics should help. Viral pneumonia may get better with rest and drinking liquids.

Preventing pneumonia is always better than treating it. The best preventive measures include washing your hands frequently, not smoking, and wearing a mask when cleaning dusty or moldy areas. There is a vaccine for pneumococcal pneumonia, a bacterial infection which accounts for up to a quarter of all pneumonias.

Defining Health Disparities

Despite prevention efforts, some groups of people are affected by HIV/AIDS, viral hepatitis, STDs, and TB more than other groups of people. The occurrence of these diseases at greater levels among certain population groups more than among others is often referred to as a health disparity. Differences may occur by gender, race or ethnicity, education, income, disability, geographic location and sexual orientation among others. Social determinants of health like poverty, unequal access to health care, lack of education, stigma, and racism are linked to health disparities.

? Optional Learning Activity

For more information on this topic, see or listen to: What You Need to Know About Infectious Diseases.

Sources

Introduction: NIH: National Institute of Allergy and Infectious Diseases, MedlinePlus, http://www.nlm.nih.gov/medlineplus/infectiousdiseases.html

Strep Throat: NIH: National Institute of Allergy and Infectious Diseases via MedlinePlus.gov

Viral Infections: NLM, NIH via MedlinePlus.gov

Influenza: NIH: National Institute of Allergy and Infectious Diseases via MedlinePlus.gov

Hepatitis B: NIH: National Institute of Diabetes and Digestive and Kidney Diseases via MedlinePlus.gov

Infectious mononucleosis: MedlinePlus.gov

Fungi: MedlinePlus.gov

Yeast Infections (or Candida): MedlinePlus.gov

Parasitic Diseases: National Library of Medicine, National Institutes for Health via MedlinePlus.gov

Pneumonia: MedlinePlus.gov

Defining Health Disparities: Centers for Disease Control and Prevention, http://www.cdc.gov/nchhstp/healthdisparities/

Exercise 8.5.1

1. How are communicable diseases transmitted?
2. Name one example of a communicable disease and its cause.
3. What are two ways to prevent the spread of infectious diseases?

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8.6: Immunity and Immunizations

In 2010, a pertussis (whooping cough) outbreak in California sickened 9,143 people and resulted in 10 infant deaths: the worst outbreak in 63 years (Centers for Disease Control 2011b). Researchers, suspecting that the primary cause of the outbreak was the waning strength of pertussis vaccines in older children, recommended a booster vaccination for 11–12-year-olds and also for pregnant women (Zacharyczuk 2011). Pertussis is most serious for babies; one in five needs to be hospitalized, and since they are too young for the vaccine themselves, it is crucial that people around them be immunized (Centers for Disease Control 2011b). Several states, including California, have been requiring the pertussis booster for older children in recent years with the hope of staving off another outbreak.

But what of people who do not want their children to have this vaccine, or any other? That question is at the heart of a debate that has been simmering for years. Vaccines are biological preparations that improve immunity against a certain disease. Vaccines have contributed to the eradication and weakening of numerous infectious diseases, including smallpox, polio, mumps, chicken pox, and meningitis.

However, many people express concern about potential negative side effects from vaccines. These concerns range from fears about overloading the child's immune system to controversial reports about devastating side effects of the vaccines. One misapprehension is that the vaccine itself might cause the disease it is supposed to be immunizing against.

Another commonly circulated concern is that vaccinations, specifically the MMR vaccine (MMR stands for measles, mumps, and rubella), are linked to autism. The autism connection has been particularly controversial. In 1998, a British physician named Andrew Wakefield published a study in Great Britain's Lancet magazine that linked the MMR vaccine to autism. The report received a lot of media attention, resulting in British immunization rates decreasing from 91 percent in 1997 to almost 80 percent by 2003, accompanied by a subsequent rise in measles cases (Devlin 2008). A prolonged investigation by the British Medical Journal proved that not only was the link in the study nonexistent, but that Dr. Wakefield had falsified data in order to support his claims (CNN 2011). Dr. Wakefield was discredited and stripped of his license, but the doubt still lingers in many parents' minds.

In the United States, many parents still believe in the now discredited MMR-autism link and refuse to vaccinate their children. Other parents choose not to vaccinate for various reasons like religious or health beliefs. In one instance, a boy whose parents opted not to vaccinate returned home to the U.S. after a trip abroad; no one yet knew he was infected with measles. The boy exposed 839 people to the disease and caused 11 additional cases of measles, all in other unvaccinated children, including one infant who had to be hospitalized. According to a study published in Pediatrics (2010), the outbreak cost the public sector $10,376 per diagnosed case. The study further showed that the intentional non-vaccination of those infected occurred in students from private schools, public charter schools, and public schools in upper-socioeconomic areas (Sugerman et al. 2010).

Consider these questions about immunization:

- Should parents be forced to immunize their children?
- How does this story of vaccines in a high-income region compare to that in a low-income region, like sub-Saharan Africa, where populations are often eagerly seeking vaccines rather than refusing them?
- Do you believe all children should receive vaccinations?

Immunity and Immunizations

Shots may hurt a little… but the diseases they can prevent can hurt a lot more! Immunization shots, or vaccinations, are essential. They protect against things like measles, mumps, rubella, hepatitis B, polio, diphtheria, tetanus and pertussis (whooping cough). Immunizations are important for adults as well as for children. Here's why.

Your immune system helps your body fight germs by producing substances to combat them. Once it does, the immune system "remembers" the germ and can fight it again. Vaccines contain germs that have been killed or weakened. When given to a healthy person, the vaccine triggers the immune system to respond and thus build immunity.

Before vaccines, people became immune only by actually getting a disease and surviving it. Immunizations are an easier and less risky way to become immune.

Optional Learning Activity

Take action to raise awareness of immunizations (e.g., Assist a school nurse to host an immunization education event for parents at a local school)

- Create and distribute an immunization reminder flyers to all the members of your organization, club or place of worship.

Vaccines

Vaccines are the best defense we have against serious, preventable, and sometimes deadly contagious diseases. Vaccines are some of the safest medical products available, but like any other medical product, there may be risks. Accurate information about the value of vaccines as well as their possible side-effects helps people to make informed decisions about vaccination.

Federal law requires that Vaccine Information Statements explaining vaccine benefits and risks be handed out whenever (before each dose) certain vaccinations are given. Vaccine Information Statements are available in Spanish and many different languages. In addition, more detailed information describing the benefits and risks of a particular vaccine is available in the Prescribing Information from the Food and Drug Administration.

The following sections answer common questions asked about vaccines and how vaccines are tested and monitored to ensure they are safe and effective. These sections are currently available in English only.
Vaccines are held to the highest standard of safety. The United States currently has the safest, most effective vaccine supply in history. Vaccines undergo a rigorous and extensive evaluation program to determine a product's safety and effectiveness. If a vaccine does receive approval, it is continuously monitored for safety and effectiveness.

Many partners work together to make sure vaccines are safe. Government health scientists work with manufacturers, health care providers, academia, and global health groups such as the World Health Organization to build a comprehensive vaccine safety system. At the Department of Health and Human Services, primarily three agencies work on vaccine safety:

- Centers for Disease Control and Prevention (CDC)
- National Institutes of Health (NIH)
- Food and Drug Administration (FDA)

Vaccines undergo rigorous and extensive testing to determine their safety and effectiveness prior to approval. Following approval, FDA carefully monitors the quality of vaccines—all manufactured lots must pass tests before they can be used. Vaccine manufacturers also must follow strict manufacturing standards, and FDA conducts routine inspections of manufacturing sites.

Scientists from FDA and CDC work closely to monitor reports of vaccine side effects (adverse events) after they are approved and used widely. FDA and CDC take all reports seriously, and work together to evaluate and address any potential problems.

Learning Activity

Watch this video titled Get The Picture: Childhood Immunizations:



After talking with parents across the country, CDC put together this short video to help answer the tough questions that real moms had about childhood immunizations.

Understanding the importance of vaccines is crucial for you to protect your children's health. Read the script

- Did watching this video help you decide on whether or not to get your child immunized?
- Interview some parents to find out what they think about this issue.

Potential Side Effects

Vaccines, like all medical products, may cause side effects in some people. Most of these side effects are minor, such as redness or swelling at the injection site. Read further to learn about possible side effects from vaccines.

Any vaccine can cause side effects. For the most part these are minor (for example, a sore arm or low-grade fever) and go away within a few days.

Remember, vaccines are continually monitored for safety, and like any medication, vaccines can cause side effects. However, a decision not to immunize a child also involves risk and could put the child and others who come into contact with him or her at risk of contracting a potentially deadly disease.

How Well Do Vaccines Work?

Vaccines work really well. No medicine is perfect, of course, but most childhood vaccines produce immunity about 90–100% of the time.

What about the argument made by some people that vaccines don't work that well . . . that diseases would be going away on their own because of better hygiene or sanitation, even if there were no vaccines?

That simply isn't true. Certainly better hygiene and sanitation can help prevent the spread of disease, but the germs that cause disease will still be around, and as long as they are they will continue to make people sick.

All vaccines must be licensed (approved) by the Food and Drug Administration (FDA) before being used in the United States, and a vaccine must go through extensive testing to show that it works and that it is safe before the FDA will approve it. Among these tests are clinical trials, which compare groups of people who get a vaccine with groups of people who get a control. A vaccine is approved only if FDA makes the determination that it is safe and effective for its intended use.

If you look at the history of any vaccine-preventable disease, you will virtually always see that the number of cases of disease starts to drop when a vaccine is licensed. Vaccines are the most effective tool we have to prevent infectious diseases.

Prevention

Vaccines help the body's immune system prepare for future attacks. Vaccines consist of killed or modified microbes, parts of microbes, or microbial DNA that trick the body into thinking an infection has occurred. A vaccinated person's immune system attacks the harmless vaccine and prepares for invasions against the kind of microbe the vaccine contained. In this way, the person becomes immunized against the microbe: if re-exposure to the infectious microbe occurs, the immune system will quickly recognize how to stop the infection.

This section explains more in detail about how your immune system works to prevent you from getting sick. Knowing how your immune system works may help you understand how vaccines work with your immune system to protect you.

What is the Immune System?

The immune system is a network of cells, tissues, and organs that work together to defend the body against attacks by "foreign" invaders. These are primarily microbes—tiny organisms such as bacteria, parasites, and fungi that can cause infections. Viruses also cause infections, but are too primitive to be classified as living organisms. The human body provides an ideal environment for many microbes. It is the immune system's job to keep them out or, failing that, to seek out and destroy them.

When the immune system hits the wrong target, however, it can unleash a torrent of disorders, including allergic diseases, arthritis, and a form of diabetes. If the immune system is crippled, other kinds of diseases result.

The immune system is amazingly complex. It can recognize and remember millions of different enemies, and it can produce secretions (release of fluids) and cells to match up with and wipe out nearly all of them.

The secret to its success is an elaborate and dynamic communications network. Millions and millions of cells, organized into sets and subsets, gather like clouds of bees swarming around a hive and pass information back and forth in response to an infection. Once immune cells receive the alarm, they become activated and begin to produce powerful chemicals. These substances allow the cells to regulate their own growth and behavior, enlist other immune cells, and direct the new recruits to trouble spots.

In addition, scientists are rapidly unraveling the genetic blueprints that direct the human immune response, as well as those that dictate the biology of bacteria, viruses, and parasites. The combination of new technology and expanded genetic information will no doubt reveal even more about how the body protects itself from disease.

Mounting an Immune Response

Infections are the most common cause of human disease. They range from the common cold to debilitating conditions like chronic hepatitis to life-threatening diseases such as AIDS. Disease-causing microbes (pathogens) attempting to get into the body must first move past the body's external armor, usually the skin or cells lining the body's internal passageways.

The skin provides an imposing barrier to invading microbes. It is generally penetrable only through cuts or tiny abrasions. The digestive and respiratory tracts—both portals of entry for a number of microbes—also have their own levels of protection. Microbes entering the nose often cause the nasal surfaces to secrete more protective mucus, and attempts to enter the nose or lungs can trigger a sneeze or cough reflex to force microbial invaders out of the respiratory passageways. The stomach contains a strong acid that destroys many pathogens that are swallowed with food.

If microbes survive the body's front-line defenses, they still have to find a way through the walls of the digestive, respiratory, or urogenital passageways to the underlying cells. These passageways are lined with tightly packed epithelial cells covered in a layer of mucus, effectively blocking the transport of many pathogens into deeper cell layers.

Mucosal surfaces also secrete a special class of antibody called IgA, which in many cases is the first type of antibody to encounter an invading microbe. Underneath the epithelial layer a variety of immune cells, including macrophages, B cells, and T cells, lie in wait for any microbe that might bypass the barriers at the surface.

Next, invaders must escape a series of general defenses of the innate immune system, which are ready to attack without regard for specific antigen markers. These include patrolling phagocytes, natural killer T cells, and complement.

Microbes cross the general barriers then confront specific weapons of the adaptive immune system tailored just for them. These specific weapons, which include both antibodies and T cells, are equipped with singular receptor structures that allow them to recognize and interact with their designated targets.

Immunity

Long ago, physicians realized that people who had recovered from the plague would never get it again—they had acquired immunity. This is because some of the activated T and B cells had become memory cells. Memory cells ensure that the next time a person meets up with the same antigen, the immune system is already set to demolish it.

Immunity can be strong or weak, short-lived or long-lasting, depending on the type of antigen it encounters, the amount of antigen, and the route by which the antigen enters the body. Immunity can also be influenced by inherited genes. When faced with the same antigen, some individuals will respond forcefully, others feebly, and some not at all.

An immune response can be sparked not only by infection but also by immunization with vaccines. Some vaccines contain microorganisms—or parts of microorganisms— that have been treated so they can provoke an immune response but not full-blown disease.

Immunity can also be transferred from one individual to another by injections of serum rich in antibodies against a particular microbe (antiserum). For example, antiserum is sometimes given to protect travelers to countries where hepatitis A is widespread. The antiserum induces passive immunity against the hepatitis A virus. Passive immunity typically lasts only a few weeks or months.

Vaccines

For many years, healthcare providers have used vaccination to help the body's immune system prepare for future attacks. Vaccines consist of killed or modified microbes, parts of microbes, or microbial DNA that trick the body into thinking an infection has occurred.

A vaccinated person's immune system attacks the harmless vaccine and prepares for invasions against the kind of microbe the vaccine contained. In this way, the person becomes immunized against the microbe. Vaccination remains one of the best ways to prevent infectious diseases, and vaccines have an excellent safety record. Previously devastating diseases such as smallpox, polio, and whooping cough (pertussis) have been greatly controlled or eliminated through worldwide vaccination programs.

Recommended Vaccines for Young Adults

The transition to adulthood is an exciting time in a young person's life. Starting a career, getting an apartment, entering college, or joining the armed forces all offer unique rewards and challenges.

Yet young adults may not know that some vaccines can make this transitional time a healthier one.

Vaccines recommended for young adults ages 19–24 include:

- Meningococcal conjugate vaccine, which helps prevent meningococcal disease
- Tdap vaccine, which protects against tetanus, diphtheria, and pertussis (also known as whooping cough)
- HPV vaccine, which protects against the viruses that cause most cervical cancers, anal cancer, and genital warts
- Seasonal flu vaccine

There may be other vaccines recommended for young adults because their health, job, or lifestyle may put them at higher risk for certain diseases. Young adults should talk to a doctor or nurse to find out if there are other vaccines that they may need.

? Learning Activity

Take this quiz to find out to find out which vaccines **YOU** may need.

Antibiotic / Antimicrobial Resistance

Antibiotics and similar drugs, together called antimicrobial agents, have been used for the last 70 years to treat patients who have infectious diseases. Since the 1940s, these drugs have greatly reduced illness and death from infectious diseases. Antibiotic use has been beneficial and, when prescribed and taken correctly, their value in patient care is enormous.

However, these drugs have been used so widely and for so long that the infectious organisms the antibiotics are designed to kill have adapted to them, making the drugs less effective. People infected with antimicrobial-resistant organisms are more likely to have longer, more expensive hospital stays, and may be more likely to die as a result of the infection.

Sexually Transmitted Diseases and HIV

Sexually transmitted diseases (STDs) are infections that you can get from having sex with someone who has the infection. The causes of STDs are bacteria, viruses, and parasites. There are more than 20 types of STDs, including:

- Bacterial
  - Gonorrhea
- Viral
  - Genital herpes
  - HIV/AIDS
  - HPV
  - Syphilis
- Parasitic
  - Trichomoniasis

Most STDs affect both men and women, but in many cases the health problems they cause can be more severe for women. If a pregnant woman has an STD, it can cause serious health problems for the baby.

If you have an STD caused by bacteria or parasites, your health care provider can treat it with antibiotics or other medicines. If you have an STD caused by a virus, there is no cure. Sometimes medicines can keep the disease under control. Correct usage of latex condoms greatly reduces, but does not completely eliminate, the risk of catching or spreading STDs.

Gonorrhea

Gonorrhea is a curable sexually transmitted disease. It is most common in young adults. The bacteria that cause gonorrhea can infect the genital tract, mouth or anus.

Gonorrhea does not always cause symptoms, especially in women. In men, gonorrhea can cause pain when urinating and discharge from the penis. If untreated, it can cause epididymitis, which affects the testicles and can lead to infertility. In women, gonorrhea can cause bleeding between periods, pain when urinating and increased discharge from the vagina. If untreated, it can lead to pelvic inflammatory disease, which causes problems with pregnancy and infertility. Gonorrhea can pass from mother to baby during pregnancy.

You can cure gonorrhea with antibiotics prescribed by your health care provider. Correct usage of latex condoms greatly reduces, but does not eliminate, the risk of catching or spreading gonorrhea.

Genital Herpes

Genital herpes is a sexually transmitted disease (STD) caused by a herpes simplex virus (HSV). It can cause sores on your genital or rectal area, buttocks, and thighs. You can get it from having sex, even oral sex. The virus can spread even when sores are not present. Mothers can also infect their babies during childbirth.

Symptoms of herpes are called outbreaks. You usually get sores near the area where the virus has entered the body. They turn into blisters, become itchy and painful, and then heal. Sometimes people do not know they have herpes because they have no symptoms or very mild symptoms. The virus can be more serious in newborn babies or in people with weak immune systems.

Most people have outbreaks several times a year. Over time, you get them less often and the symptoms become milder. The virus stays in your body for life.

Medicines do not cure genital herpes, but they can to help your body fight the virus. This can help lessen symptoms, decrease outbreaks, and lower the risk of passing the virus to others. Correct usage of latex condoms can reduce, but not eliminate, the risk of catching or spreading herpes.

? Learning Activity

Watch this video about Molly's story and herpes.

HPV (or genital warts)

Human papillomaviruses (HPV) are common viruses that can cause warts. There are more than 100 types of HPV. Most are harmless, but about 30 types put you at risk for cancer. These types affect the genitals and you get them through sexual contact with an infected partner. They are classified as either low-risk or high-risk. Low-risk HPV can cause genital warts. High-risk HPV can lead to cancers of the cervix, vulva, vagina, and anus in women. In men, it can lead to cancers of the anus and penis.

Although some people develop genital warts from HPV infection, others have no symptoms. Your health care provider can treat or remove the warts. In women, Pap smears can detect changes in the cervix that might lead to cancer.

Correct usage of latex condoms greatly reduces, but does not eliminate, the risk of catching or spreading HPV. A vaccine can protect against several types of HPV, including some that can cause cancer.

Trichomoniasis

Trichomoniasis is a sexually transmitted disease caused by a parasite. It affects both women and men, but symptoms are more common in women. Symptoms in women include a green or yellow discharge from the vagina, itching in or near the vagina and discomfort with urination. Most men with trichomoniasis don't have any symptoms, but it can cause irritation inside the penis.

You can cure trichomoniasis with antibiotics. In men, the infection usually goes away on its own without causing symptoms. But an infected man can continue to infect or reinfect a woman until he gets treated. So it's important that both partners get treated at the same time. Correct usage of latex condoms greatly reduces, but does not eliminate, the risk of catching or spreading trichomoniasis.

AIDS and HIV

AIDS was first reported in the United States in 1981 and has since become a major worldwide epidemic. AIDS is caused by the human immunodeficiency virus, or HIV. By killing or damaging cells of the body's immune system, HIV progressively destroys the body's ability to fight infections and certain cancers. People diagnosed with AIDS may get life-threatening diseases called opportunistic infections. These infections are caused by microbes such as viruses or bacteria that usually do not make healthy people sick.

Since 1981, more than 980,000 cases of AIDS have been reported in the United States to the Centers for Disease Control and Prevention (CDC). According to CDC, more than 1,000,000 Americans may be infected with HIV, one-quarter of whom are unaware of their infection. The epidemic is growing most rapidly among minority populations and is a leading killer of African-American males ages 25 to 44. According to CDC, AIDS affects nearly seven times more African Americans and three times more Hispanics than whites. In recent years, an increasing number of African-American women and children are being affected by HIV/AIDS.

- The U.S. HIV/AIDS epidemic began in 1981 and continues to disproportionately affect minorities, men who have sex with men of all races, women, and youth.
- More than 1 million people in the United States currently are living with HIV/AIDS.
- About 21 percent of those infected with HIV are unaware of their infection.
- Since the U.S. epidemic began, 617,025 people have died of AIDS.
- In 2008, there were approximately 42,439 new HIV infections, with the highest proportion among African Americans despite the fact that they make up only 12 percent of the U.S. population.

HIV

HIV stands for human immunodeficiency virus. It kills or damages the body's immune system cells. AIDS stands for acquired immunodeficiency syndrome. It is the most advanced stage of infection with HIV.
HIV most often spreads through unprotected sex with an infected person. It may also spread by sharing drug needles or through contact with the blood of an infected person. Women can give it to their babies during pregnancy or childbirth.

The first signs of HIV infection may be swollen glands and flu-like symptoms. These may come and go a month or two after infection. Severe symptoms may not appear until months or years later.

A blood test can tell if you have HIV infection. Your health care provider can perform the test.

There is no cure, but there are many medicines to fight both HIV infection and the infections and cancers that come with it. People can live with the disease for many years.

AIDS Prevention

Currently, there is no vaccine to prevent HIV infection nor is there a cure for HIV/AIDS. To reduce your risk of becoming infected with HIV or transmitting the virus to others

- Get tested regularly for HIV
- Practice abstinence
- Remain faithful to your spouse or partner
- Consistently use male latex or female polyurethane condoms
- Do not share needles

Detection and Treatment in HIV Prevention

Testing and treatment of sexually transmitted diseases (STDs) can be an effective tool in preventing the spread of HIV, the virus that causes AIDS. An understanding of the relationship between STDs and HIV infection can help in the development of effective HIV prevention programs for persons with high-risk sexual behaviors.

What is the link between STDs and HIV infection?

Individuals who are infected with STDs are at least two to five times more likely than uninfected individuals to acquire HIV infection if they are exposed to the virus through sexual contact. In addition, if an HIV-infected individual is also infected with another STD, that person is more likely to transmit HIV through sexual contact than other HIV-infected persons (Wasserheit, 1992).

There is substantial biological evidence demonstrating that the presence of other STDs increases the likelihood of both transmitting and acquiring HIV.

- **Increased susceptibility.** STDs appear to increase susceptibility to HIV infection by two mechanisms. Genital ulcers (e.g., syphilis, herpes, or chancroid) result in breaks in the genital tract lining or skin. These breaks create a portal of entry for HIV. Additionally, inflammation resulting from genital ulcers or non-ulcerative STDs (e.g., chlamydia, gonorrhea, and trichomoniasis) increase the concentration of cells in genital secretions that can serve as targets for HIV (e.g., CD4+ cells).
- **Increased infectiousness.** STDs also appear to increase the risk of an HIV-infected person transmitting the virus to his or her sex partners. Studies have shown that HIV-infected individuals who are also infected with other STDs are particularly likely to shed HIV in their genital secretions. For example, men who are infected with both gonorrhea and HIV are more than twice as likely to have HIV in their genital secretions than are those who are infected only with HIV. Moreover, the median concentration of HIV in semen is as much as 10 times higher in men who are infected with both gonorrhea and HIV than in men infected only with HIV. The higher the concentration of HIV in semen or genital fluids, the more likely it is that HIV will be transmitted to a sex partner.

How can STD treatment slow the spread of HIV infection?

Evidence from intervention studies indicates that detecting and treating STDs may reduce HIV transmission.

- **STD treatment reduces an individual's ability to transmit HIV**. Studies have shown that treating STDs in HIV-infected individuals decreases both the amount of HIV in genital secretions and how frequently HIV is found in those secretions (Fleming, Wasserheit, 1999).
- Herpes can make people more susceptible to HIV infection, and it can make HIV-infected individuals more infectious. It is critical that all individuals, **especially those with herpes**, know whether they are infected with HIV and, if uninfected with HIV, take measures to protect themselves from infection with HIV.

- Among individuals with both herpes and HIV, trials are underway studying if treatment of the genital herpes helps prevent HIV transmission to partners.

? Learning Activity

Watch this video about AIDS from PBS.

Illness, Sickness, and Disease

Discussing the complexities of what constitutes a disease requires careful distinction among related, but distinct concepts. In 1973, Susser, an epidemiologist, proposed some definitions that remain useful. He used “illness” to refer to the subjective sense of feeling unwell; illness does not define a specific pathology, but refers to a person’s subjective experience of it, such as discomfort, tiredness, or general malaise. The way a patient reports symptoms is influenced by his or her cultural background, and Susser applied the term “sickness” to refer to socially and culturally held conceptions of health conditions (e.g., the dread of cancer or the stigma of mental illness), which in turn influence how the patient reacts). The social perceptions of disease that Illich described modify the ways a patient perceives and presents his symptoms.

Cultural conventions likewise affect where the boundary between disease and non-disease is placed: menopause may be considered a health issue in North America, but symptoms are far less commonly reported in Japan. Disease implies a focus on pathological processes that may or may not produce symptoms and that result in a patient’s illness. For example, a patient complains of tiredness and malaise–his illness as he experiences it. He consults a doctor about it–because he believes that he might have a sickness. The doctor might attribute the patient’s symptoms to a thyroid condition–a disease.

This model focuses on pathological processes, and on understanding, diagnosing, and treating the physical and biological aspects of disease. The goal of treatment is to restore the patient’s physiological integrity and function. Diagnosis involves recognizing and applying a label to a pattern of signs and symptoms that is at least partly understood in terms of abnormal structure or function of cells, organs, and systems. This offers a rational basis for the investigation of effective treatments. For instance, a certain pattern of chest pain known as angina pectoris is understood biologically as a disorder of the coronary arteries that causes cardiac ischemia, and the treatments it are geared to the specific causes of restoring cardiac blood flow and reducing cardiac effort.

Early biomedical conceptions supposed that a disease is either present or absent: a bacterium has invaded the body or it has not. However, as medicine increasingly tackled conditions, such as hypertension, which represent deviations from normal values, which themselves have a range and can be debated, it became apparent that there may be no set threshold for defining disease. Thus, instead of being seen as a state that is qualitatively distinct from health, many diseases have to be approached as a quantitative threshold on a continuum of biological variability. Organizations such as the World Health Organization (WHO) and the National Institutes of Health have proposed different classifications of hypertension and have changed how they constitute hypertension over time. Hypertension can be mild, moderate or severe, or defined as pre-hypertension or hypertension stage 1 or stage 2.

✔ Optional: Video Lectures about Epidemics

Epidemics in Western Society is a course taught Frank Snowden at Yale.

This course consists of video lectures with an international analysis of the impact of epidemic diseases on western society and culture from the bubonic plague to HIV/AIDS and the recent experience of SARS and swine flu.

Leading themes include:

- infectious disease and its impact on society
- the development of public health measures
- the role of medical ethics
- the genre of plague literature
- the social reactions of mass hysteria and violence
- the rise of the germ theory of disease
- the development of tropical medicine
- a comparison of the social, cultural, and historical impact of major infectious diseases

- the issue of emerging and re-emerging diseases

Sources

Source: OpenStax College, Introduction to Health and Medicine, Connexions, May 18, 2012. http://cnx.org/content/m43019/1.2/

Immunity and Immunizations: National Institute of Allergy and Infectious Diseases via MedlinePlus.gov

Vaccines: Vaccines, US Dept. of Health and Human Services, http://www.vaccines.gov

Vaccines: National Institute of Allergy Infectious Diseases

Recommended Vaccines for Young Adults: College, CDC, www.cdc.gov/vaccines/spec-grps/college.htm

Antibiotic / Antimicrobial Resistance: Antimicrobal Resistance**,** CDC, http://www.cdc.gov/drugresistance/index.html

Sexually Transmitted Diseases and HIV: Sexually Transmitted Diseases, Centers for Disease Control and Prevention via MedlinePlus, http://www.nlm.nih.gov/medlineplus/sexuallytransmitteddiseases.html

Gonorrhea: Gonorrhea, Centers for Disease Control and Prevention via MedlinePlus, http://www.nlm.nih.gov/medlineplus/gonorrhea.html

Genital Herpes: Genital Herpes, Medline, NLM, NIH, http://www.nlm.nih.gov/medlineplus/herpessimplex.html

HPV (or genital warts): HPV, NLM, NIH, http://www.nlm.nih.gov/medlineplus/hpv.html

Trichomoniasis: Trichomoniasis, NLM, NIH, http://www.nlm.nih.gov/medlineplus/trichomoniasis.html

AIDS and HIV: AIDS and HIV, NIAID, NIH, www.niaid.nih.gov/topics/hivaids/understanding/Pages/Default.aspx

HIV: HIV, National Library of Medicine, National Institutes for Health, http://www.nlm.nih.gov/medlineplus/hivaids.html

AIDS Prevention: AIDS Prevention, NIAID, NIH, www.niaid.nih.gov/topics/hivaids/understanding/prevention/Pages/prevention.aspx

Detection and Treatment in HIV Prevention: Role Detection and Treatment in HIV Prevention, CDC, http://www.cdc.gov/std/hiv/STDFact-STD-HIV.htm

Illness, Sickness, and Disease: AFMC Primer on Population Health,The Association of Faculties of Medicine of Canada, CC-BY-NC-SA, phprimer.afmc.ca/Part1-TheoryThinkingAboutHealth/Chapter1ConceptsOfHealthAndIllness/IllnessSicknessandDisease

? Exercise 8.6.1

1. What is the difference between innate and adaptive immunity?
2. How do vaccines help protect the body from disease?
3. Why is herd immunity important for community health?

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