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Genetic
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# Using Family History to Improve Your Health Web Quest

## Abstract

Students explore the *Using Family History to Improve Your Health* module on the Genetic Science Learning Center website to complete a web quest.

## Logistics

### Time Required

▶ **Class Time:**
50-80 minutes

▶ **Prep Time:**
10 minutes to copy student pages

### Materials

Student pages, computers with Internet access

### Prior Knowledge Needed

None

### Appropriate For:

| Primary | Intermediate | Secondary | College |
|---------|--------------|-----------|---------|

## Learning Objectives

▶ Chronic diseases such as heart disease, cancer and diabetes, run in families.

▶ An individual's environment, personal choices and genetic make-up all contribute to their risk of developing a chronic disease.

▶ Family health histories can provide important information about an individual's risk of develoing a chronic disease.

▶ Lifestyle modifications that improve health can reduce an individual's risk of developing a chronic disease.

Module

Using Family History to Improve Your Health

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# Using Family History to Improve Your Health

# Classroom Implementation

**Activity instructions:**

- Have students log on to the *Using Family History to Improve Your Health* module at http://gslc.genetics.utah.edu/units/health.

- Instruct students to navigate their way through the module to complete the web quest (pages S-1 – S-6).

# Standards

**U.S. National Science Education Standards**

Grades 5-8:
Content Standard F: Science in Personal and Social Perspectives - Risks and Benefits
- Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences. The results are used to determine the options for reducing or eliminating risks.

- Students should understand the risks associated with personal hazards (smoking, dieting, and drinking).

- Important personal and social decisions are made based on perceptions of benefits and risks.

Grades 9-12:
Content Standard F: Science in Personal and Social Perspectives - Personal and Community Health
- Many diseases can be prevented, controlled or cured.

- Personal choice concerning fitness and health involves multiple factors. Personal goals, peer and social pressures, ethnic and religious beliefs, and understanding of biological consequences can all influence decisions about health practices.

**U.S. National Health Education Standards**

Grades 5-8:
Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.
- Describe how family history can impact personal health.

Standard 2: Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.
- Examine how the family influences the health of adolescents.

Standard 3: Students will demonstrate the ability to access valid information and products and services to enhance health.

# Quantities

## Per Student
➤ One copy of student pages S-1 to S-6

Module

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# Using Family History to Improve Your Health

- Describe situations that may require professional health services.

Grades 9-12:
Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.
- Analyze how genetics and family history can impact personal health.

Standard 2: Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.
- Analyze how family influences the health of individuals.

Standard 3: Students will demonstrate the ability to access valid information and products and services to enhance health.
- Determine when professional health services may be required.

### AAAS Benchmarks for Science Literacy

Grades 6-8:
The Human Organism: Physical Health - Students should extend their study of the healthy functioning of the human body and ways it may be promoted or disrupted by diet, lifestyle, bacteria, and viruses. Students should consider the effects of tobacco, alcohol, and other drugs on the way the body functions.

- The amount of food energy (calories) a person requires varies with body weight, age, sex, activity level, and natural body efficiency. Regular exercise is important to maintain a healthy heart/lung system, good muscle tone, and bone strength.

- Toxic substances, some dietary habits, and some personal behavior may be bad for one's health. Some effects show up right away, others may not show up for many years. Avoiding toxic substances, such as tobacco, and changing dietary habits to reduce the intake of such things as animal fat increases the chances of living longer.

## Credits

Activity created by:
April Mitchell, Genetic Science Learning Center
Brendan Nicholson, Genetic Science Learning Center (illustrations)

## Funding

## Additional Resources

**Visit the Genetic Science Learning Center website to get links to great resources like this one! Just click on *Using Family History to Improve Your Health*, then scroll down each page to find relevant *Additional Resources*.**

- Centers for Disease Control and Prevention (CDC): learn more about preventing chronic disease and public health research.

Promote ■ Prevent ■ Protect

Utah
Department
of Health

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## Using Family History to Improve Your Health

# Answer Key

## Using Family History to Improve Your Health

**1. What does it mean to be "at risk" for developing a disease?**

You are likely to develop the disease, but can possibly prevent it.

**2. Why is it important to know your family health history?**

- It can tell you if a disease runs in your family, putting you at risk.
- If you know you're at risk, you can take steps to protect yourself.

**3. What two factors contribute to a person's risk?**

Genetics and environment

**4. Why is it important to make healthy choices and take good care of your body?**

You can reduce, if not neutralize, genetic risk factors and add years to your life.

**5. When talking to parents and grandparents about your family's health history, which diseases should you ask about?**

- Heart disease
- Stroke
- Asthma
- Diabetes

- Osteoporosis
- Cancer
- High Blood Pressure
- High Cholesterol

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**Using Family History to Improve Your Health**

**Answer Key**

**6. What "features" of a family health history are most informative when it comes to assessing disease risk?**

- Having one or more close relatives with the same medical condition.
- Having a relative diagnosed with a condition at an early age (typically before age 55).
- Having a relative with a disease that is more rare in a certain gender (for example, a female with heart disease).
- Having a combination of diseases that run in your family (for example, both diabetes and heart disease).

## Learn more: Calculating Genetic Risk

**7. Compare and contrast diseases caused by a single gene with more complex diseases influenced by multiple genes. (Fill in the answers to complete the table below.)**

| Disease caused by: | Rare or common? | Possible inheritance patterns? | Risk is very predictable? |
|---|---|---|---|
| **Single gene** | *Rare* | *Dominant or recessive* | *Yes* |
| **Multiple genes** | *Common* | *Multifactorial* | *No* |

**8. Heart disease, stroke, cancer and diabetes are all examples of which type of disease: a single gene disease or a complex disease?** *Circle the row on the table above that describes the characteristics of these diseases.*

These are all complex diseases

Module

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# Using Family History to Improve Your Health
## Answer Key

# Learn more: Lifestyle Choices and Risk

**9. State the two leading causes of preventable death in the United States.**

Tobacco and obesity

**10. What are the three types of fuel the human body uses to get energy?**

Carbohydrates, proteins and fats

**11. Most people know that smoking cigarettes is bad for your lungs, but smoking also affects your heart. How?**

Nicotine narrows blood vessels and decreases the amount of good cholesterol in the blood.

# Learn more: Nutrition and Physical Activity

**12. State the two requirements for a healthy diet.**

- Eating a variety of foods
- Choosing the best foods in each group

**13. Healthy foods are low in** __calories, saturated and trans fats__ **and high in** __fiber____.

**14. How many grams of fiber should a person get every day?**

20-35 grams

**15. If fiber comes from plants, which foods do you think contain the most fiber?**

Fruits and vegetables

**16. Define physical activity. Give two examples of physical activity not already provided.**

Any movement produced by muscular contractions that burns extra calories. Examples will vary.

**17. How much physical activity per day is recommended for teens?**

60 minutes

# Using Family History to Improve Your Health
## Answer Key

## Learn More: Most Common Complex Diseases

**18. Match the disease with its correct definition and/or symptoms:**

| | | |
|---|---|---|
| A. Heart Disease/Stroke | E | Uncontrolled cell growth resulting in tumor formation |
| B. Asthma | G | Contributes to the formation of plaques on the inner walls of blood vessels (called atherosclerosis) |
| C. Diabetes | D | Having too little bone mass and easily broken bones, most commonly hip fractures |
| D. Osteoporosis | B | Narrowing of airways in the lung causing difficulty breathing |
| E. Cancer | F | Excessive force on walls of blood vessels, over-working the heart and kidneys |
| F. High Blood Pressure | C | Inability to produce or use the hormone insulin, resulting in toxic accumulation of sugar in the blood |
| G. High Cholesterol | A | A narrowing of the blood vessels that restricts blood flow to the heart or brain |

## Learn More: Heart Disease and Stroke

**19. What are the top three causes of death in America?**

Heart disease, cancer and stroke

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**Using Family History to Improve Your Health**

Answer Key

# Learn More: Blood Pressure and Cholesterol

**20. Imagine you are a doctor visiting with a patient who has high cholesterol. What lifestyle changes would you recommend to help him lower his cholesterol? Why?**

Avoid smoking tobacco, maintain a healthy body weight, participate regularly in physical activity, eat foods low in sodium and cholesterol, and replace trans and saturated fats with unsaturated fats.

# Learn More: Diabetes

**21. How does overweight and obesity increase a person's risk of developing type 2 diabetes? (Your brief answer should include the following key words: insulin, hormone, glucose, type 2 diabetes.)**

Insulin is a hormone that encourages cells to drink up the sugar (called glucose) circulating in the blood after a meal. Obesity causes a person's cells to forget how to use insulin. Therefore, sugar builds up in the blood and causes the symptoms of type 2 diabetes.

# Learn More: Osteoporosis

**22. You have a friend who struggles with an eating disorder and is underweight. While researching ways to help her, you find out that teens with eating disorders are at increased risk of developing osteoporosis in later years. Why? (Your brief answer should include the following key words: calcium, bone tissue, osteoporosis.)**

Teens with eating disorders typically are not getting enough calcium in their diet. To supply the body with needed calcium, bone tissue must be broken down more often. This can cause osteoporosis in later years.

# Learn More: Cancer

**23. How can damage to a growth control gene in a single cell in the body sometimes lead to cancer? (Your brief answer should include the following key words: cell growth, genes, mutation, tumor, metastasize.)**

Cell growth is controlled by a group of genes. If one of these genes acquires a mutation, too many cells will be produced. Excess cells clump together to form a tumor. The cancer becomes very serious if the tumor begins to spread or metastasize throughout the body.

**24. When talking to your family about their health history, what are the four most common cancers that you want to ask them about?**

Prostate, breast, lung and colon cancer

**25. Define what is meant by a "close relative" and state what is considered an "early age" at diagnosis.**
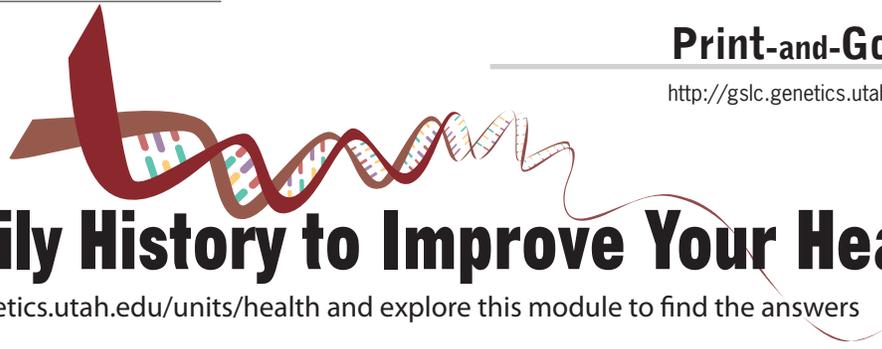
- Only a grandparent, parent or sibling is considered a "close" relative.
- Age 50-55 is an early age to develop one of these more common forms of cancer.

Name

Date

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# Using Family History to Improve Your Health

Log on to: http://gslc.genetics.utah.edu/units/health and explore this module to find the answers to the questions below.

Hint: the Search feature on this website may or may not help you find what you are looking for; it is best to go through the module to find the answers.

**1. What does it mean to be "at risk" for developing a disease?**

**2. Why is it important to know your family health history?**

**3. What two factors contribute to a person's risk?**

**4. Why is it important to make healthy choices and take good care of your body?**

**5. When talking to parents and grandparents about your family's health history, which diseases should you ask about?**

Name _____

Date _____

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**6. What "features" of a family health history are most informative when it comes to assessing disease risk?**

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# Learn More: Heart Disease and Stroke

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Name

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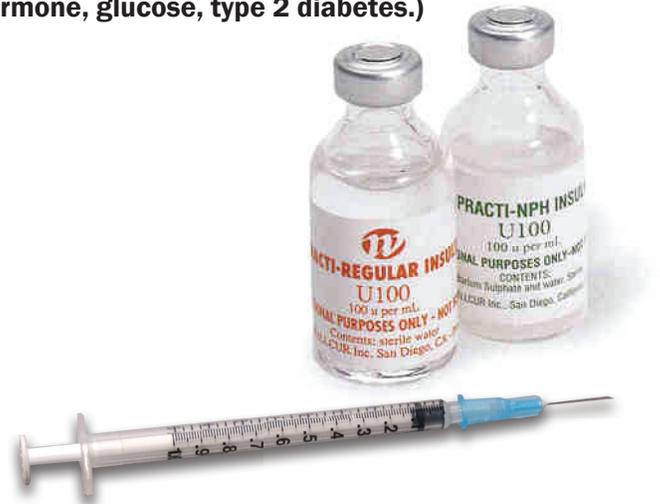
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