

**Adventures in Medicine & Science (AIMS)
Practical Anatomy & Surgical Education
St. Louis University School of Medicine
Distance Learning Program**

You Are What You Eat: Teen Nutrition

Description:

A specialist in nutrition will provide teens with ideas and information for making positive health changes. Exercise and healthy food choices will be emphasized. 5 A Day, the DASH Diet, and the new US government food pyramid will be discussed. Health risks associated with obesity will also be discussed.

Pre-Program Activity Suggestions:

- Activity: Have each student weigh and measure themselves at home so that they calculate their body Mass Index
- Download the BMI-Boys 2-20 chart and the BMI-Girls 2-20 and copy for each of the students in the class.
- Download: DASH Diet handout
- Download: Food Record
- Download: My Pyramid worksheet
- Download a copy of the new government food pyramid Mypyramid.gov

Program objectives

After participation in this program, the students will:

1. Be able to calculate BMI (Body Mass Index)
2. Recognize the health risks associated with obesity including cardiac-heart disease, diabetes, high blood pressure (hypertension), stroke, structural problems with carrying extra weight, cancer.
3. Identify the norms for heart rate, blood pressure (diastolic and systolic) and cholesterol.
4. Identify at least 4 ways to reduce risks.
5. Identify the components of the DASH diet.
6. Identify physical activities to maintain cardiac health
7. Make healthful food choices in real-life settings
8. Use the food guide pyramid and nutrition fact labels as tools for making healthy food choices
9. Increase the amounts of fruits, vegetables, whole grains and calcium-rich products they consume.
10. Watch portion size

National Science Education Standards:

HEALTH

NPH-H.K-5.5 USING COMMUNICATION SKILLS TO PROMOTE HEALTH

Students will demonstrate the ability to use interpersonal communication skills to enhance health.

NPH-H.K-5.1 HEALTH PROMOTION AND DISEASE PREVENTION

Students will comprehend concepts related to health promotion and disease prevention.

NPH-H.K-5.2 HEALTH INFORMATION, PRODUCTS AND SERVICES

Students will identify characteristics of valid health information and health-promoting products and services.

SCIENCE

NS.K-5.6 PERSONAL AND SOCIAL PERSPECTIVES

As a result of activities in grades K-4, all students should develop understanding of personal health.

Missouri Show Me Standards

Goal 4

Students will acquire the knowledge and skills to make decisions and act as responsible members of society.

7. Identify and apply practices that preserve and enhance the safety and health of self and others

Health/Physical Education knowledge

2. Principles and practices of physical and mental health (such as personal health habits, nutrition, stress management)

3. Diseases and methods for prevention, treatment, and control

5. Methods used to assess health, reduce risk factors, and avoid high-risk behaviors (such as violence, tobacco, alcohol and other drug use)

Procedure:

➤ **Calculate BMI**

Have students visit this website and fill in their height and weight to calculate their BMI quickly.

<http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm>

To calculate manually:

<http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-adult-formula.htm>

In English Units:

$$\text{BMI} = \left(\frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \right) \times 703$$

In Metric Units:

$$\text{BMI} = \frac{\text{Weight in Kilograms}}{(\text{Height in Meters}) \times (\text{Height in Meters})} \quad \text{or} \quad \text{BMI} = \left(\frac{\text{Weight in Kilograms}}{(\text{Height in centimeters}) \times (\text{Height in centimeters})} \right) \times 10,000$$

Once they have determined their BMI, then tell them to plot their BMI on either the CDC Growth Chart (either for girls or boys ages 2-20) determine if they are underweight, normal weight, at risk overweight, or overweight.

Each of the CDC BMI-for-age gender specific charts contains a series of curved lines indicating specific percentiles. Healthcare professionals use the following established percentile cutoff points to identify underweight and overweight in children.

Underweight	BMI-for-age < 5th percentile
Normal	BMI-for-age 5th percentile to < 85th percentile
At risk of overweight	BMI-for-age 85th percentile to < 95th percentile
Overweight	BMI-for-age ≥ 95th percentile

FOR ADULTS:

Underweight <18.5 BMI

Normal weight 18.5-24.9 BMI

Overweight = 25–29.9 BMI

Obesity = 30-39.9 BMI

Extreme Obesity ≥ 40 BMI

Discuss Health Risks associated with obesity

Heart Disease (Risk factors include family history, cigarette smoking, high cholesterol, high blood pressure , glucose intolerance, obesity, sedentary lifestyle)

Non-modifiable risk factors – Age, gender, race/ethnicity, family history

Modifiable Risk Factors –Smoking, high cholesterol, high blood pressure, poor nutrition, diabetes, physical inactivity

1. Risk- Smoking – Stop Smoking

2. Risk - High Cholesterol

To reduce cholesterol in your blood, eat foods low in saturated fat and cholesterol, lose weight if you need to and exercise for a total of at least 30 minutes on most or all days of the week. Some people may also need to take medicine, because changing their diet isn't enough

Lipid profile (This test is recommended every 5 years for adults 20 +)

LDL

HDL

ATP III Classification of LDL, Total, and HDL Cholesterol	
LDL Cholesterol	
<100 mg/dl	Optimal Level
100-129 mg/dl	Near Optimal/Above Optimal
130-159 mg/dl	Borderline High
160-189 mg/dl	High
≥ 190 mg/dl	Very High
Total Cholesterol	
<200 mg/dl	Desirable
200-239 mg/dl	Borderline High
≥240 mg/dl	High
HDL Cholesterol	
<40 mg/dl	Low
≥60 mg/dl	High

3. Risk -High Blood Pressure

Blood pressure is usually measured while you are seated with your arm resting on a table. Your arm should be slightly bent so that it is at the same level as your heart. The upper arm should be bare, with your sleeve comfortably rolled up.

Blood pressure readings are usually given as 2 numbers: for example, 110 over 70 (written as 110/70). The first number is the systolic blood pressure reading, and it represents the maximum pressure exerted when the heart contracts. The second number is the diastolic blood pressure reading, and it represents the pressure in the arteries when the heart is at rest.

To obtain your blood pressure measurement, your health care provider will wrap the blood pressure cuff snugly around your upper arm, positioning it so that the lower edge of the cuff is 1 inch above the bend of the elbow.

The provider will locate the large artery on the inside of the elbow by feeling for the [pulse](#) and will place the head of the stethoscope over this artery, below the cuff. It should not rub the cuff or any clothing because these noises may block out the pulse sounds. Correct positioning of the stethoscope is important to get an accurate recording.

Your provider will close the valve on the rubber inflating bulb and then will squeeze it rapidly to inflate the cuff until the dial or column of mercury reads 30 mmHg (millimeters of mercury) higher than the usual systolic pressure. If the usual systolic pressure is unknown, the cuff is inflated to 210 mmHg.

Now the valve is opened slightly, allowing the pressure to fall gradually (2 to 3 mmHg per second). As the pressure falls, the level on the dial or mercury tube at which the pulsing is first heard is recorded. This is the systolic pressure.

As the air continues to be let out, the sounds will disappear. The point at which the sound disappears is recorded. This is the diastolic pressure (the lowest amount of pressure in the arteries as the heart rests).

Systolic Blood Pressure: first number is the systolic blood pressure reading, and it represents the maximum pressure exerted in the arteries when the heart contracts

Diastolic Blood Pressure: it represents the pressure in the arteries when the heart is at rest.

Classification	Systolic	Diastolic
Normal	<120 mg/dl	<80 mg/dl
Pre-Hypertension	120-139 mg/dl	80-89 mg/dl
Stage 1 Hypertension	140-159 mg/dl	90-99 mg/dl
Stage 2 Hypertension	>160 mg/dl	>100 mg/dl

Lifestyle changes to reduce blood pressure

- Don't smoke cigarettes or use any tobacco product.
- Lose weight if you're overweight.
- Exercise regularly.
- Eat a healthy diet that includes lots of fruits and vegetables and is low in fat.
- Limit your sodium, alcohol and caffeine intake.
- Try relaxation techniques or biofeedback.

Stroke- A stroke occurs when a blood vessel that brings oxygen and nutrients to the brain bursts or is clogged by a blood clot or some other mass. Because of this rupture or blockage, part of the brain doesn't get the blood and oxygen it needs. Deprived of oxygen, nerve cells in the affected area of the brain can't work and die within minutes. And when nerve cells can't work, the part of the body they control can't work either. The devastating effects of a severe stroke are often permanent because dead brain cells aren't replaced.

4. Risk - Poor Nutrition

Healthy lifestyle to prevent and assist in the treatment of hypertension:

- Weight reduction if overweight or obese
- DASH diet (Dietary Approaches to Stop Hypertension)
- 2000 kcal DASH Eating Plan

Food Group	Daily Servings
Grains, Grain Products	7-8 daily
Vegetables	4-5 daily
Fruits	4-5 daily
Low-fat or Fat-free Dairy Foods	2-3 daily
Lean Meat, Poultry, Fish	2 or less daily (6oz total)
Nuts, Seeds, Dry Beans	4-5 per week
Fats, Oils (Heart Healthy)	2-3 daily
Sweets	5 per week

3100 Kcal DASH Eating Plan

Food Group	Daily Servings
Grains, Grain Products	12-13 daily
Vegetables	6 daily
Fruits	6 daily
Low-fat or Fat-free Dairy Foods	3-4 daily
Lean Meat, Poultry, Fish	2-3 daily (6-9 oz total)
Nuts, Seeds, Dry Beans	1 daily
Fats, Oils (Heart Healthy)	4 daily
Sweets	2 per week

Consume diet rich in fruits, vegetables, low fat dairy products and reduced fat and saturated fat.
Dietary Sodium reduction
Moderation of alcohol intake

5. Risk – Diabetes

Type 2 diabetes is the most common form of diabetes. In type 2 diabetes, either the body does not produce enough insulin or the cells ignore the insulin. Insulin is necessary for the body to be able to use sugar. Sugar is the basic fuel for the cells in the body, and insulin takes the sugar from the blood into the cells. When glucose builds up in the blood instead of going into cells, it can cause two problems:

- Right away, your cells may be starved for energy.
- Over time, high blood glucose levels may hurt your eyes, kidneys, nerves or heart.

Pre-diabetes is a serious medical condition that can be treated. The good news is that the recently completed **Diabetes Prevention Program study conclusively showed that people with pre-diabetes can prevent the development of type 2 diabetes by making changes in their diet and increasing their level of physical activity.** They may even be able to return their blood glucose levels to the normal range.

While the DPP also showed that some medications may delay the development of diabetes, diet and exercise worked better. Just 30 minutes a day of moderate physical activity, coupled with a 5-10% reduction in body weight, produced a 58% reduction in diabetes.

6. Risk – limited physical activity

Increase physical activity

- **Physical activity is very important not only for assisting in weight management but also for the health benefits that accompany an active lifestyle.**
- **Accumulate 30 – 60 minutes on most days of the week. Activities like walking, gardening, and raking leaves are okay to start with.**

- **Discuss 5 A Day for Better Health program- established in 1991 as a partnership between the National Cancer Institute and the Produce for Better Health Foundation. All national health authorities support 5 a day including: the Surgeon General of the US , the Center for Disease control and prevention, the US Public Health Service, the US Department of Agriculture, the American Cancer Society, the American Institute for Cancer Research and the American Heart Association.**

Eating 5 a Day is eating 5-9 servings of fruits and vegetables a day.

- At every meal and snack eat at least one serving of a fruit or vegetable
- Start your morning with a glass of 100 % fruit juice (3/4 cup)
- For a morning snack eat a piece of fresh fruit, a banana, apple, orange or pear. A medium piece of fruit is one serving
- Eat a large salad with your lunch. A large salad with 3 cups of mixed greens counts as three servings.
- For an afternoon snack munch on raw vegetables like raw carrots or celery sticks. A handful counts as one serving
- For dinner eat a dark green leafy vegetable such as broccoli or spinach. ½ cup of cooked vegetables counts as one serving
- For an evening snack choose dried fruit like raisins or dried plum. ¼ cup of dried fruit counts as one serving
- Every day eat at least one vitamin A rich food or vegetable such as cantaloupe, carrots, sweet potato, spinach or broccoli
- Every day eat at least one vitamin C rich fruit or vegetable such as orange juice, grapefruit juice, fresh pineapple, green pepper or cauliflower
- Every day eat at least one high fiber fruit or vegetable such as apples, grapefruit or broccoli
- Several times each week eat cruciferous (cabbage family vegetables like Arugula, Bok choy, Broccoli, Brussels sprouts, Cabbage, Cauliflower, Chinese cabbage, Collard greens, Daikon, Kale, Kohlrabi, Mustard greens Radishes, Rutabaga, Turnips, Watercress

Fats, Oils & Sweets
USE SPARINGLY

KEY

■ Fat (naturally occurring and added)

■ Sugars (added)

These symbols show fats and added sugars in foods.

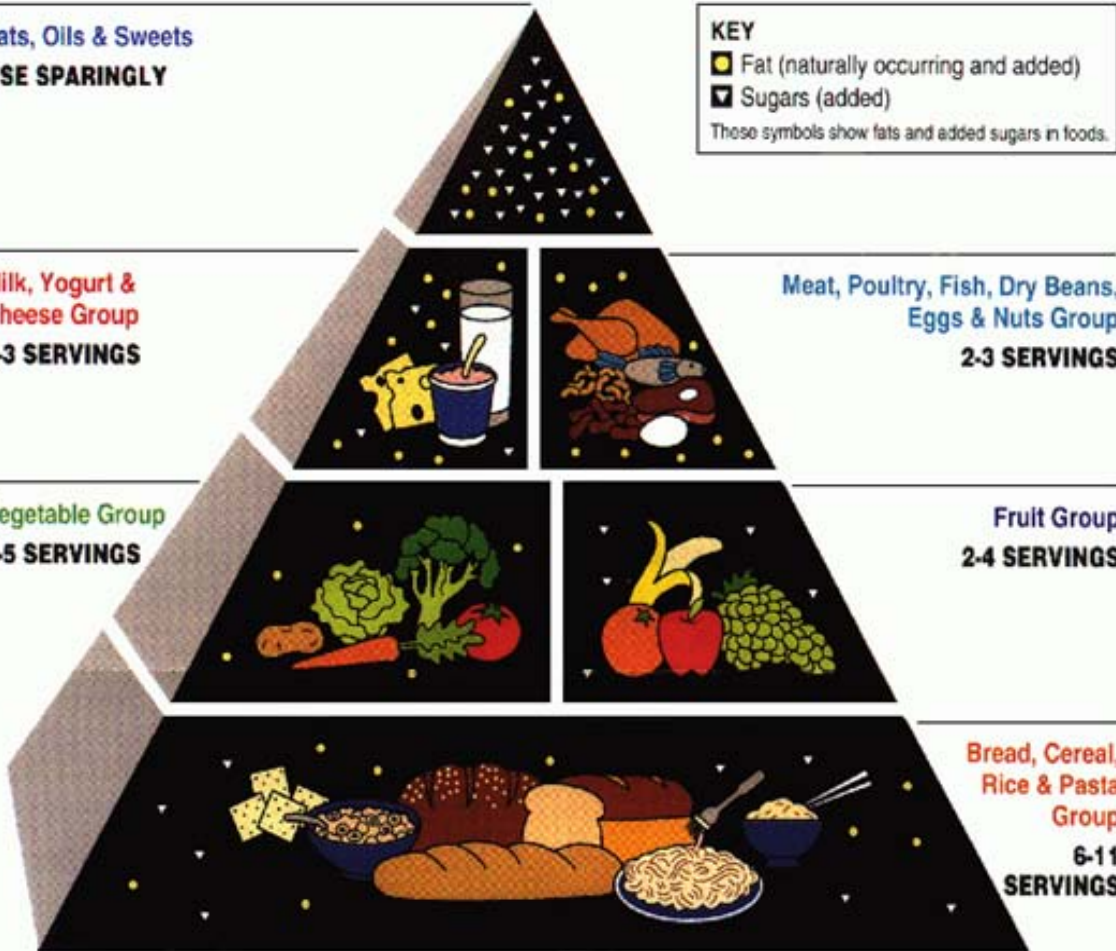
Milk, Yogurt & Cheese Group
2-3 SERVINGS

Meat, Poultry, Fish, Dry Beans, Eggs & Nuts Group
2-3 SERVINGS

Vegetable Group
3-5 SERVINGS

Fruit Group
2-4 SERVINGS

Bread, Cereal, Rice & Pasta Group
6-11 SERVINGS



New Government Food Pyramid

mypyramid.gov

Vocabulary/ Glossary

5 A Day for Better Health program - Is a national program to encourage all Americans to eat 5-9 servings of fruits and vegetables every day for good health

Blood pressure- The pressure exerted by the blood against the walls of the blood vessels, especially the arteries

BMI- Body Mass Index – BMI stands for **B**ody **M**ass **I**ndex. It is a number that shows body weight adjusted for height

In English Units:

$$\text{BMI} = \left(\frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \right) \times 703$$

Diastolic Blood Pressure: it represents the pressure in the arteries when the heart is at rest.

HDL- the HDL cholesterol is a test that measures the amount of high-density lipoprotein (HDL) [cholesterol](#) in serum.

HDL cholesterol is known as the "good" cholesterol because a high level of it seems to protect against heart attack. (Low HDL cholesterol levels [less than 40 mg/dL] increase the risk for heart disease.)

LDL- A high LDL level (more than 160 mg/dL or 130 mg/dL or above if you have two or more risk factors for cardiovascular disease) reflects an increased risk of heart disease. That's why LDL cholesterol is often called "bad" cholesterol.

Stroke- A stroke occurs when a blood vessel that brings oxygen and nutrients to the brain bursts or is clogged by a blood clot or some other mass. Because of this rupture or blockage, part of the brain doesn't get the blood and oxygen it needs. Deprived of oxygen, nerve cells in the affected area of the brain can't work and die within minutes. And when nerve cells can't work, the part of the body they control can't work either. The devastating effects of a severe stroke are often permanent because dead brain cells aren't replaced.

There are two main types of stroke. One (**ischemic stroke**) is caused by blockage of a blood vessel; the other (**hemorrhagic stroke**) is caused by bleeding. Bleeding strokes have a much higher fatality rate than strokes caused by clots.

Systolic Blood Pressure: first number is the systolic blood pressure reading, and it represents the maximum pressure exerted when the heart contracts

Related Websites:

5 A Day

<http://www.fns.usda.gov/tn/Educators/index.htm>

<http://www.nutritionexplorations.org/educators/lessons-main.asp>

http://www.dole5aday.com/Teachers/T_Index.jsp

<http://www.nutritionforkids.com/>

<http://dairycouncilofca.org/edu/index.html>

<http://www.leafy-greens.org/lessonplans.html>

BMI

<http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm>

HDL and LDL Cholesterol

<http://www.americanheart.org/presenter.jhtml?identifier=180>

My Pyramid.com

<http://www.mypyramid.gov/>

<http://www.mypyramid.gov/professionals/index.html>

MY PYRAMID TRACKER

<http://www.mypyramidtracker.gov/>

Post-Program Activity Suggestions:

- Review Fad diets – South Beach, Adkins and see how they compare to five a day and food pyramid.
- Compare the DASH diet to mypyramid.gov . Does the DASH diet to reduce high blood pressure follow the new government food pyramid ? Explain.
- Show students the PowerPoint – My Pyramid Point to Point . Download it from <http://www.mypyramid.gov/professionals/index.html>
- Have students set up an account and log into My Pyramid Tracker and enter what they eat for one week and the amount of exercise they get. Have their eating habits and exercise patterns changed after one week? Did they follow the guidelines?
- Have students make up a list of possible forms of exercise (walk, run, ride a bike, swim, jump rope, play ball, dance, mow grass, etc.) and chart how many of these they engage in each week. (Give incentives for those who exercise the most)
- Have students keep track of the times during the week when they are sedentary (not related to school work). Examples might be watching TV, playing on the computer, video games.