2016 4-H Healthy Lifestyles Invitational
Study Guide

The following are the official resources for the 2016 4-H Healthy Lifestyles Invitational Contest. While youth may study other educational resources to prepare for the contest, the resources included in this packet will be used in the development of the contest.

**Fad Diets**
Winning with Nutrition: Fads & Facts Lesson

**Hydration/Sports Drinks**
Winning with Nutrition - Hydration Station Lesson

**Nutrient Functions**
Nutrient Needs at a Glance

**Healthy Snacks**
Consumer Decision Making Nutritious Snacks Study Guide

**Emergency Preparedness**
Emergency Preparedness Info (from www.ready.gov/texas)

**Sun Safety**
American Cancer Society Skin Cancer Prevention & Early Detection

**Physical Activity**
Choose My Plate Physical Activity Resource

**First Aid**
Keeping Fit & Healthy - First Aid in Action
(available from www.4-hcurriculum.org)
Objectives
1. Students will be able to recognize fad diets.
2. Students will be able to identify healthful ways to manage weight.
3. Students will be able to identify the risks of using fad diets.
4. Students will be able to identify correct uses for nutritional supplements.

Materials needed
Copies of “Spotting a Fad Diet” activity sheet
Copies of “Fad Diet Evaluator” activity sheet
Variety of magazines
Scissors
Copies of “Nutrition: Fads and Facts” (handout)
Copies of "Build a Healthy Meal” – www.choosemyplate.gov

Getting started
Have students work in pairs to answer the following questions:
1. What are some examples of fad diets?
2. What attracts people to use these diets?
3. What effects do fad diets have on your overall health?
4. Why do people use dietary supplements?

Optional opening activity
Present several of the following claims, asking students to say whether they are fact or fiction. After getting their answers, discuss the claims.

Claim: Low-carb (high-protein) diets are the most effective way to lose weight.

Fiction. Although there will be some weight loss, this type of diet appears to have few benefits, and they may not last long. This is not a realistic diet for most people. Any time you eliminate a certain food or food group from your diet, you are eliminating a source of the nutrients you need. The best diet is one that has all food groups and that balances the calories you eat with the calories you burn. If you eliminate certain types of foods you do not have a balance and any effort to lose weight will be sabotaged. You must reduce your calorie intake by 3,500 calories to lose a pound. You can do this by eliminating 500 calories each day, by eating less, and/or by exercising more.
Claim: Eating white foods (or any other color of food) is bad for you.

Fiction. The color of a food has nothing to do with its nutritional value. Some of the most nutritious foods are white—bananas, pears and garlic. Color may indicate the kind of nutrients a food contains. Eliminating white foods would eliminate good sources of fiber for a healthy GI tract, potassium for normal kidney and heart function, and vitamin C for a healthy immune system. Remember, there are no "bad" foods, just bad food choices.

Claim: Eating grapefruit (or putting lime/lemon in your water) will help you burn fat.

Fiction. There is no food that can magically melt fat from your body. However, grapefruit can be part of a well-rounded diet. It is fat free, low in calories and a great source of vitamin C, fiber and folic acid. Folic acid is essential for combating birth defects and keeping the immune system healthy. The same applies to lemons and limes. The citric acids in these fruits will not melt away fat. But if flavoring your water with them causes you to drink more water, they are beneficial.

Claim: Calories eaten after 8:00 p.m. turn to fat.

Fiction. There is no connection between calories and the clock. It is all about the amount of calories consumed versus the amount of calories used. If you eat more calories than your body burns in a day, the excess calories will be stored as fat. Remember, you must reduce your daily calories by 500 to lose 1 pound each week. You can do this by eating fewer calories or by exercising more to burn calories. The opposite effect occurs if you consume 500 additional calories daily without burning them off. You will gain 1 pound over the week. Some people suffer from acid reflux, which can be worse after eating a late meal. If you suffer from this, choose light, low-acid foods for late evening meals and snacks.

Claim: Drinking lots of water will help you lose weight.

Fact and Fiction. Sugar-sweetened teas, juice drinks and regular sodas are full of calories but have no nutritional value. A 12-ounce can of regular soda has about 150 calories. If you drink water instead you will consume fewer calories, which is the key to weight loss. Simply increasing your water intake and not eliminating high-calorie beverages won’t cause weight loss, won’t boost your metabolism, and won’t flush away fat. However, it may make your stomach feel fuller temporarily.

Claim: Exercising on an empty stomach burns more fat.

Fiction. This is the number one way to sabotage your weight loss and muscle-building regime. During exercise, the body uses carbohydrates and fat for energy. The best way to provide fuel for exercise is to eat a snack first. Skipping a pre-workout meal or snack won’t help you burn more calories or fat. It will only bring on fatigue more quickly so that you shorten your exercise time and burn fewer calories. Make sure your pre-activity snack has enough
carbohydrates, which provide glucose—the main source of energy for the body. This will help you get the most out of your workout and make it to the end of your training routine.

**Claim: If I quit exercising, my muscles will turn into fat.**

**Fiction.** Muscle, or lean tissue, does not transform into fat tissue in the absence of exercise. The same is true for fat; it will not turn into muscle with exercise. The two types of tissues are completely different. Muscles are built through repetitious exercise. If you’re injured and can’t exercise for awhile, your muscles may lose size and tone, but those can be rebuilt. If you eat too many calories while you’re not exercising you’ll gain body fat. It may seem that fat is replacing muscle, but that is because body fat is increasing while you’re losing muscle tone.

**Claim: To bulk up my muscles I should eat only high-protein foods.**

**Fiction.** Consuming extra dietary protein won’t help you build up extra muscle. Muscles are built up through strength and resistance exercises. In fact, eating too much protein and not enough carbohydrate will actually cause you to lose muscle. When you exercise, your muscles need fuel and the best source of fuel for your muscles is carbohydrates. If you’re eating mostly protein and little carbohydrate, your body will begin to use protein as its energy source, which means there is less protein available in your body for muscle building. The best diet for athletes contains about 12 to 15 percent protein, with 50 to 60 percent coming from healthful carbohydrates such as brown rice, wheat pasta, whole-grain bread, and low-fat fruits and vegetables, and 25 to 30 percent from fats.

**Claim: If I am working on my endurance by concentrating only on cardio exercises, I should eat primarily carbohydrates, such as pasta, cereals and whole grains.**

**Fact and Fiction.** For endurance activities you do need to build up the stores of glycogen in your muscles. You can do this by consuming a diet that has more carbohydrates than normal. This is commonly called “carb loading.” However, carb loading is much more than just eating a big plate of spaghetti. It is not a one-day event.

Think of nutrition as part of your training routine. You need to give your body time to adjust to the activity as well as to the nutrients you are putting into your body. The best diet for any athlete is one that has balanced nutrition. About 55 to 65 percent of your daily calories should come from carbohydrates. This amount will allow you to replenish depleted glycogen stores. Don't overdo the carbohydrates because too much can lead to gastrointestinal distress. It is recommended that you eat 4 grams of carbohydrates per pound of body weight per day. But you also need adequate protein. Plan to eat 0.6 to 0.7 grams of protein per pound of body weight per day. Although fat is essential in the diet, you will want to reduce your fat intake to approximately 25 to 30 percent of
your daily calories. Remember, if you are including more calories from carbohydrates, you will have to cut the calories from another source—in this case, fat.

**Instruction**

“Fad” diets are diets that claim to help you lose a large amount of weight in a small amount of time, but aren’t based on the facts of nutrition and health. These diets are usually not supervised by a doctor or dietitian and often lead to long-term health problems. You may have heard of some fad diets such as the low-carb diet, the grapefruit diet, and the high-protein diet. How can you know if a diet is healthy or if it is a fad?

Here are a few clues to identifying a fad diet.

- **The diet is based on drastically reducing the number of calories consumed every day.** Starvation-type diets that require fasting or eating very little often promise quick results. Unfortunately, our bodies are not designed to drop pounds quickly. The body’s natural reaction to fasting is to dump water. So on a starvation-type diet most, if not all, of the weight lost is from water. Once a person begins to eat normally again, the body absorbs all of the water it is lacking and the lost water weight comes back quickly.

- **The diet is based on taking special pills, powders, herbs, etc.** These diets are usually just gimmicks—ways to get your money. Many diet pills contain laxatives or diuretics that force the body to eliminate water. As with fasting-type diets, the weight loss from these supplements is mainly water, not fat.

  Other supplements claim that their ingredients speed up metabolism, suppress the appetite, or even block the absorption of fat into the body. These claims may not be true. (Very few dietary supplements are approved by doctors or the Food and Drug Administration.) These kinds of supplements are considered very dangerous for teens because their long-term effects on growth patterns are not known.

- **The diet tells you to eat only specific foods or foods in certain combinations.** There is no scientific proof that combining different types of foods will help you lose weight. And if you are limiting your diet to only certain foods, your body is not getting all the nutrients it needs for healthy development and performance.

- **The diet eliminates fat, sugar or carbohydrates.** Depriving your body of certain foods and their nutrients is a very bad idea for growing teenagers or athletes. It is better to eat smaller portions in well-balanced meals that contain foods from every food group. Eating smaller portions will also help you set good eating habits that will help you keep the weight off.

- **The diet requires you to skip meals or replace meals with special shakes or food bars.** Diets that ask you to replace meals with their products could be denying your body the nutrients it needs for healthy development and performance.
The diet is part of a special weight-loss program. You have probably seen claims that some weight loss programs help you sweat off extra weight. Sweating in a sauna—or wearing a rubber belt or nylon clothes that make you sweat during exercise—may cause weight loss. However, the pounds that disappear come from water loss, not body fat. As soon as you drink or eat, weight returns. Instead of helping to achieve a healthful weight goal, “sweating off” pounds may damage your health through dehydration.

Some fad diets are linked to potential health risks:

- **Loss of muscle:** People who lose a lot of weight quickly risk losing lean body tissue (muscle). When muscle is lost, your metabolism slows down. This is one reason why most people regain the weight they lost when they are no longer “on a diet.”

- **Gastrointestinal problems:** Diets containing lots of protein or fat and little carbohydrate usually lack dietary fiber. Not having enough fiber in your diet can lead to constipation. If you are on a diet that limits your fruit and vegetable consumption, you are missing out on some important phytochemicals that may promote health and prevent disease.

- **Increased risk of osteoporosis:** Diets with little calcium and lots of animal protein may increase the rate at which calcium is lost from the bone. This can lead to osteoporosis. Remember, your bones are as strong as they will be by the time you turn 30 years old! Until that age you are still building bones, so it’s important not to limit the calcium bones need to continue growing and strengthening.

The bottom line for fad diets is that if they sound too good to be true, they most certainly are! To lose weight successfully you must reduce calories and increase physical activity. You must choose a healthful eating plan that includes a variety of foods from all the food groups and be physically active at least 60 minutes each day.

Sometimes diets encourage people to think of certain foods as “good” and “bad,” when the truth is that everything is okay in moderation. Teens should eat a variety of foods, and there is nothing wrong with the occasional treat. The best way to stay at a healthful weight is to make wise food choices every day. Eating well does not mean you are always on a diet. It means understanding that food is the way to fuel the body!

**Ten tips for building a healthy meal:**

1. Make half your plate vegetables and fruit. They are full of nutrients and may help promote good health. Choose red, orange, and dark green vegetables such as tomatoes, sweet potatoes, and broccoli.

2. Choose protein foods such as lean beef and pork, chicken, turkey, beans, or tofu. Twice a week, make seafood the protein on your plate.

3. Aim to make at least half your grains whole grains. Look for the words “100% whole grain” or “100% whole wheat” on the food label. Whole grains provide more nutrients, like fiber, than do refined grains.
4. Pair your meal with a cup of fat-free or low-fat milk. They provide the same amount of calcium and other essential nutrients as whole milk, but less fat and calories. If you don’t drink milk, try soymilk or include fat-free or low-fat yogurt in your meal.

5. Heavy gravies and sauces add fat and calories to otherwise healthy choices. For example, steamed broccoli is great, but avoid topping it with cheese sauce. Try other options, like some low-fat Parmesan cheese or a squeeze of lemon.

6. Savor your food. Eat slowly, enjoy the taste and textures, and pay attention to how you feel. You’re more likely to eat too much if you eat very quickly.

7. To help with portion control, use a smaller plate at meals. It helps you finish your entire meal and feel satisfied without overeating.

8. Eat at home more often so you know exactly what you are eating. If you eat out, compare the nutrition information for the various dishes. Choose healthier options such as baked instead of fried foods.

9. Keep it interesting by eating foods that you’ve never tried before, like mango, lentils, or kale. You may find a new favorite!

10. Indulge in a naturally sweet dessert—fruit! Serve a fresh fruit cocktail or a fruit parfait made with yogurt. For a hot dessert, try baked apples topped with cinnamon.

**Supplements**

You’ve all seen ads for products that claim they can help you lose weight and be a better athlete. These products usually claim that a doctor or scientist has said their product really works and will make you stronger, thinner, smarter, or better at whatever you do.

You may be tempted to take supplements because it sounds so easy—all you have to do is take the pills and you’ll get wonderful results. The truth is, there is little evidence that dietary supplements have the benefits they claim. There is evidence, however, that they can seriously damage your health, especially if you’re a teenager.

Dietary supplements are products that contain vitamins, minerals, amino acids, herbs or botanicals (plants), or any concentration, extract or combination of these. Supplements are sold as pills, gel capsules, liquids or powders. Unfortunately, no one really knows how safe they are because the U.S. Food and Drug Administration, which checks the safety of foods and medicines before they come on the market, does not check supplements. The FDA does not even have the authority to ensure that supplements contain the ingredients they claim to have.

Some athletes take dietary supplements to improve their performance. But claims for these products are often exaggerated or not based on scientific evidence. Sports supplements such as creatine are unregulated. That means no one knows what the standard dose should be and how safe it is, especially for teens.
Another popular supplement for teen athletes is amino acid powder, which claims to increase muscle mass. The truth is, this product doesn’t have any special muscle-building powers. Amino acids are the building blocks of protein, which the body uses, along with exercise, to build muscle. But the human body can easily get all the amino acids it needs from the protein in food. So if you work out properly and eat a balanced diet with enough protein, taking amino acid supplements won’t actually do anything for you, except cost you money!

Energy bars are sometimes used as supplements as well. Use them with caution. They are packed with calories and many other ingredients. They may serve a purpose for athletes who burn lots of calories in high-intensity workouts like competitive cycling and running, but for most people they just add unwanted calories to the diet.

The best way to get your daily dose of vitamins and minerals is through the foods you eat. Talk to your doctor before taking any additional vitamins or supplements.

Conclusion

Being healthy is really about being at a weight that is right for you. The best way to find out whether you are at a healthy weight or if you need to lose or gain weight is to talk to a doctor. He or she can help you set realistic goals. Following fad diets, using unnecessary supplements, and putting yourself at risk for eating disorders is not a healthful or successful way to meet your weight loss and athletic performance goals.

Activity

Have students complete the "Spotting a Fad Diet" worksheet, then discuss it.

Have students go through a variety of magazines and look for ads for fad diets and weight loss programs. Working in groups, the students should cut out the ads and give group presentations about them, including their claims and the fact/fiction surrounding them.

Resources

“Getting the Skinny on Fad Diets,” Texas AgriLife Extension Service
fcs.tamu.edu/food_and_nutrition/nutrifacts – Issue #7
www.kidshealth.org – Nemours Foundation
www.pbskids.org/itsmylife/body – Information on smoking and alcohol
www.youngwomenshealth.org – Center for Young Women’s Health
American Psychiatric Association
www.healthyminds.org/Main-Topic/Addiction.aspx
www.choosemyplate.gov
Spotting a Fad Diet

A “fad” is a currently popular practice. Fad diets may help you lose weight quickly—and some may even be safe—but others may cause some big health problems and may even be dangerous. Here is a sample fad diet. Read it carefully and evaluate it using the Fad Diet Evaluator Sheet.

Dr. Atlas’s Wonder Diet

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 hard-boiled eggs</td>
<td>Salami and cheese</td>
</tr>
<tr>
<td>4 slices of bacon</td>
<td>Fried flounder (fish)</td>
</tr>
<tr>
<td>1 ounce of cheese</td>
<td>Tossed salad</td>
</tr>
<tr>
<td>Lunch</td>
<td>Evening snack</td>
</tr>
<tr>
<td>Chicken salad</td>
<td>Whole milk</td>
</tr>
<tr>
<td>Ham rolls</td>
<td></td>
</tr>
<tr>
<td>Orange juice</td>
<td></td>
</tr>
</tbody>
</table>

1. In order to lose weight one must not eat more than 20 grams of carbohydrate per day—the amount of carbohydrate found in two slices of bread or one piece of fruit.

2. By eating a low-carbohydrate diet, you may reach a state called “ketosis,” which is a condition caused by abnormal burning of fat in the body. This diet enables you to lose weight without feeling hungry, and your body will wash away extra calories.

3. Concentrate on eating mostly meats, poultry, fish, and dairy products.

4. Don’t worry about your fat intake. When you reach the ketosis state, the fat calories will simply be washed away.

5. You must avoid all foods that contain any sugars, sweeteners, white flour, and cornstarch. Also avoid all processed foods.

6. Make sure you take a multi-vitamin and the following amino acid supplements: arginine, lysine, and branched-chain amino acids.

7. You can lose 5 pounds in only 1 week as long as you follow the diet exactly.
Nutrition: Fads and Facts

“Fad” diets are diets that claim to help you lose a lot of weight in a short time, but may have little scientific truth to back them up.

Here are some ideas to help you spot a fad diet:

- The diet is based on drastically reducing the number of calories consumed each day.
- The diet is based on taking special pills, powders, herbs, etc.
- The diet tells you to eat only specific foods or foods in certain combinations.
- The diet eliminates fat, sugar or carbohydrates.
- The diet requires you to skip meals or replace meals with special shakes or food bars.
- The diet is part of a special weight loss program.

Remember, if it sounds too good to be true, it probably is!!

The media often delivers the message that being thin and beautiful is the solution to all problems. Many of today’s teen athletes are influenced by what they see and may try fads to help them lose weight or bulk up. However, such practices are rarely helpful and may actually be harmful. Becoming obsessed with your weight and the food you eat can lead to an eating disorder.

Being healthy is really about being at a weight that is right for you. The best way to find out if you are at a healthy weight is to talk with a doctor. Following fad diets, using unnecessary supplements, and putting yourself at risk for eating disorders is not a healthy way to meet your weight loss or athletic performance goals.
Objectives
1. Students will be able to determine whether they are adequately hydrated.
2. Students will be able to explain why water is important to the body and its functions.
3. Students will be able to describe when it is preferable to drink water rather than a sports drink.

Materials needed
Ingredients for sports drink in Activity #1
Copies of word find activity sheets
Assorted prizes for game winners
Supplies for Activity #2 (optional)

Getting started
This lesson can be started with a lecture or with the word find activity. Pass out copies of the word find activity sheet and let the students complete them. If desired, give prizes to those who finish first, second and third. Prizes appropriate for this lesson include water bottles, cups, or allowing the winning students to make the homemade sports drink for the rest of the class. After the students have completed the activity, discuss the terms used in the word find (with the help of the glossary) and their relationship to proper hydration.

Instruction
Hydration before, during and after competition
Fluid intake is vital before and during physical activity. When your body is properly hydrated, nutrients are transported easily and you maintain a healthy body temperature. In addition, fluids protect the body’s organs and tissues during physical activity.

When you don’t drink enough fluids your body becomes dehydrated. We all know that during physical activity fluids are lost through the skin as sweat. Did you know that you also lose water through your lungs when you breathe and through your urine? Without the proper amount of fluids, the body will not work to its full potential. For athletes, this means their performance will not be at its peak.
Replacing fluids to stay hydrated is important no matter what type of physical activity you do. Before you begin your activity, start drinking water. Keep drinking during your activity to ensure that you stay at your peak performance. Do not wait until you feel thirsty to drink; thirst is one of the first signs of dehydration!

There are several factors that affect fluid loss:
1. High altitudes increase fluid loss.
2. High temperature can increase fluid loss.
3. Some athletes sweat more than others; sweating increases fluid loss.
4. Longer periods of exercise and your level of endurance can affect fluid loss.

**Schedule your water breaks**

When you're doing rigorous physical activity, schedule your water breaks. Of course you may not always be able to stop during a game or practice for water, but you should try to stick to this schedule as much as possible. And don't forget to begin hydration several hours before an event.

<table>
<thead>
<tr>
<th>When</th>
<th>How much to drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weigh yourself before physical activity</td>
<td></td>
</tr>
<tr>
<td>2 hours before physical activity</td>
<td>2 cups of water</td>
</tr>
<tr>
<td>15 minutes before physical activity</td>
<td>1 to 2 cups of fluid</td>
</tr>
<tr>
<td>Every 15 minutes during activity</td>
<td>½ to 1 cup of fluid</td>
</tr>
<tr>
<td>Weigh yourself again after the activity</td>
<td>3 cups of fluid for each pound of body weight lost</td>
</tr>
</tbody>
</table>

On warm, humid days, sweat does not evaporate quickly, so you may need to drink more!

**Signs of dehydration**

The easiest way to know whether or not you are dehydrated is to check the color, volume, and odor of your urine. If you have a small volume of urine that is dark and has a strong odor, it is a sign that you are dehydrated. In this case, drink water until the urine volume is normal and it is a pale yellow color with no odor. The color of your urine when you are well hydrated is like the color of light lemonade. When you are dehydrated, urine color compares to apple juice.

Here are some other signs of dehydration:
- Thirst, dry mouth, flushed skin
- Fatigue
- Headache
- Dizziness, weakness
- High body temperature
- Increased breathing rate, rapid pulse
- Skin that stays in a pinched position

If you have any of these symptoms, replace lost fluids immediately. If your symptoms persist or worsen, see your doctor.

**Sports drinks vs. water**

Nutrition experts seem to agree that water is the best thing to drink for physical activity lasting less than 60 minutes. For activities lasting longer than 60 minutes, sports drinks may be beneficial. Sports drinks provide carbohydrates, or fuel, for muscles, and the sodium and glucose in sports drinks can help the body absorb fluids. If your physical activity lasts longer than 60 minutes, sports drinks may enhance your athletic performance.

Although research suggests that people may drink more (and stay better hydrated) when they have flavored beverages, don’t forget that some sports drinks tend to have lots of calories. If weight management is one of your goals, try diluting your sports drink with water. It will still be flavorful, but you will be adding more water to your body and decreasing the number of calories you consume.

**The right balance**

When comparing sports drinks, experts recommend that you consider the following:

1. **The right amount of carbohydrates.** Look for a range of 4 to 8 percent. Sports drinks containing more than 8 percent carbohydrates will not be absorbed as quickly and could upset your stomach. To determine the percent of carbohydrates in a drink, use the formula below.

   \[
   \frac{\text{# grams of carbohydrates}}{\text{# of milliliters}} \times 100 = \% \text{ carbohydrates}
   \]

   Note: 1 cup = 240 milliliters, ½ cup = 120 milliliters

   **Example:** 1 cup of soda (not diet) has 27 grams of carbohydrates

   \[
   \frac{27 \text{ grams}}{240 \text{ milliliters}} \times 100 = 11.25 \% \text{ carbohydrates}
   \]

   Because of its high carbohydrate content, soda would not make a good sports drink.

2. **The right type of carbohydrate.** High levels of fructose can upset the stomach, so look for beverages that contain more sucrose and glucose and less fructose. This information will be printed on the Nutrition Facts panel on the food label.
3. **No carbonation and no caffeine.** Carbonated beverages, like soda, can upset the stomach.

4. **Lightly sweetened, lightly flavored.** Sports drinks contain sodium to make them taste better. Unless you are active for a very long time, extra sodium is not necessary for good hydration.

**Facts about energy drinks**

Energy drinks are becoming very popular, especially among young people. Most young people turn to energy drinks when they aren’t getting enough sleep. When you’re tired from being up late studying or when you’ve been out too late with friends, you might think an energy drink would be a quick fix. An athlete might have an energy drink to get an instant burst of energy and a competitive edge.

But remember that energy drinks usually have double or triple the amount of caffeine in carbonated soda. Although caffeine affects everyone differently, it usually boosts heart rate and blood pressure, it may cause an upset stomach, and it may prevent sleep. We really don’t know how caffeine affects teen athletes. Few published studies are available. So use energy drinks cautiously and don’t let them replace more nutritious beverages.

**Activity #1**

**Make your own sports drink**

We all know that sports drinks are not cheap! Some can cost more than 28¢ per 8 ounces. That adds up quickly! As mentioned earlier, sports drinks are also loaded with calories. In this activity, you will make your own sports drink that is low in calories and costs very little.

**Supplies:**
- 1 cup of sugar
- 1 teaspoon salt
- 1 cup boiling water
- 1 cup orange juice
- 15 cups cold water

**Instructions:**

Put the sugar, salt and boiling water in a plastic pitcher and stir until the sugar is dissolved. Add the juice and cold water and stir. Chill. Makes 1 gallon. Each 8-ounce glass contains 12 grams of carbohydrate (5 percent glucose) and about 55 calories and costs about 7¢ to make using store-brand products.

As the students are enjoying their sports drink, have them name it and design a label for it. The label should include the nutrition information. Have the students use the formula to calculate the percentage of carbohydrate.
Other sports drink recipes to try:

<table>
<thead>
<tr>
<th>Alternate Recipe 1</th>
<th>Alternate Recipe 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix together:</td>
<td>Mix together:</td>
</tr>
<tr>
<td>½ cup honey</td>
<td>10 tablespoons sugar</td>
</tr>
<tr>
<td>½ teaspoon light salt</td>
<td>⅛ teaspoon light salt</td>
</tr>
<tr>
<td>¼ cup lemon juice</td>
<td>1 pkg. unsweetened powdered drink mix</td>
</tr>
<tr>
<td>2 liters water</td>
<td>2 liters water</td>
</tr>
</tbody>
</table>

**Supplemental activities**

1. Ask a local company or organization to donate water bottles for the students. Have students attach the labels they design to the bottles.

2. Purchase a few different sports drinks and fruit juices. Have students compare the amounts of fructose and glucose they contain.

3. Purchase four different beverages (water, juice drink, soda, energy drink, etc.) and have students decide which would be best for a sports drink, giving their reasons.

**Activity #2**

*How much sugar is in my drink?*

**Supplies:**
- Sugar
- Measuring spoons (teaspoons, at least three)
- Colored paper or colored plates (paper or plastic)
- Sturdy paper for table tents
- 1 12-ounce Coke®
- 1 20-ounce Gatorade®
- 1 12-ounce Red Bull®
- 1 16-ounce Borden® whole chocolate milk
- 1 16-ounce Minute Maid® orange juice
- Optional: Purchase the poster “Rethink Your Drink” from Health Edco. Cut out the pictures of the drinks.
- Table

**Instructions:**

Make table tents; put the name of a drink or a picture of the drink on one side and the number of teaspoons of sugar it contains on the other side. Place the table tents on a table, with the names or pictures facing away from students so they can’t see them. Place the colored paper or plates in front of the table tents. Have students measure the amount of sugar indicated on each table tent onto the paper or plate in front of it. Show students the various types of beverages and ask them to work as a group to place each drink in front of the plate where they think it belongs. Then turn the table tents to reveal the names of the drinks. Compare the students’ choices with the actual amount of sugar in each drink.
EXAMPLE

Step 1:

<table>
<thead>
<tr>
<th>9 ½ teaspoons</th>
<th>8 ½ teaspoons</th>
<th>9 ½ teaspoons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate</td>
<td>Plate</td>
<td>Plate</td>
</tr>
</tbody>
</table>

Step 2:

<table>
<thead>
<tr>
<th>12-oz Coke</th>
<th>20-oz Gatorade</th>
<th>12-oz Red Bull</th>
</tr>
</thead>
</table>

MEASUREMENTS

- 12-oz Coke® = 9 ½ teaspoons
- 20-oz Gatorade® = 8 ½ teaspoons
- 12-oz Red Bull® = 9 ½ teaspoons
- 16-oz Borden® whole chocolate milk = 12 teaspoons
- 16-oz Minute Maid® orange juice = 12 teaspoons

Resources

“Energy and Sports Drinks: Help or Hype.” HealthHints Newsletter, February/March 2006 ([fcs.tamu.edu/health/healthhints](http://fcs.tamu.edu/health/healthhints))

Nutri-Facts, Issue 6, Revised November 2004
[fcs.tamu.edu/food_and_nutrition/nutrifacts/](http://fcs.tamu.edu/food_and_nutrition/nutrifacts/)

Preventing Dehydration: Sports Drinks or Water, Bob Murray, June 2008
[http://www.gssiweb.com/](http://www.gssiweb.com/) (Search by author or title)

Brown University Health Education, December 2008
[http://www.brown.edu/Student_Services/Health_Services/Health_Education](http://www.brown.edu/Student_Services/Health_Services/Health_Education) (Search for energy drinks)
Hydration Station...Keys to Keeping Athletes Hydrated

Hydration is a key factor in a solid athletic performance. To ensure proper hydration, you need to drink fluids before, during and after a game or workout. Don’t rely on thirst to tell you it is time to drink more; keep to a hydration schedule!

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity/Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 hours before a workout</td>
<td>Weigh yourself. Drink 2 cups of water</td>
</tr>
<tr>
<td>15 minutes before workout</td>
<td>Drink 1 to 2 cups of fluid.</td>
</tr>
<tr>
<td>During the workout</td>
<td>Try to drink ½ to 1 cup of fluid every 15 minutes.</td>
</tr>
<tr>
<td>After the workout</td>
<td>Weigh yourself. For every pound lost, drink 3 cups of fluid.</td>
</tr>
</tbody>
</table>

Note: 1 cup = 8 ounces

Make sure you are adequately hydrated with normal or above normal urine production and light yellow urine.

When choosing a sports drink, look for:
- 12 to 15 grams of carbohydrates per 8-ounce serving
- Sucrose and glucose as the carbohydrate source (fructose may cause stomach upset)
- No carbonation, no caffeine, and no alcohol
- Lightly sweetened, light flavor

### Make Your Own Sports Drink
- 4 tablespoons sugar
- ¼ teaspoon salt
- ¼ cup boiling water
- ¼ cup orange juice OR 2 tablespoons lemon juice
- 3 ¾ cups cold water

Put the sugar, salt and boiling water in a plastic pitcher. Stir until the sugar is dissolved. Add the juice and cold water, then chill in the refrigerator. Makes 1 quart. Each 8-ounce glass of this sports drink contains 12 grams of carbohydrate (5 percent glucose) and 55 calories and costs about 7¢ to make.

### Energy Drinks Ups and Downs
Energy drinks may sound like a good way for a sluggish athlete to perk up, but be careful! Energy drinks are often full of sugar, caffeine and other ingredients. Most energy drinks have double or triple the amount of caffeine in a soda. Caffeine can boost heart rate and blood pressure and prevent sleep. To make sure you are alert and ready for a game, get plenty of sleep, eat a proper diet, drink plenty of water or sports beverages, and skip the energy drink!

Water vs. Sports Drinks
Water is a great source of fluid when exercising for less than 60 minutes, but for activities lasting more than an hour a sports drink might be a better choice. Sports drinks provide fuel for muscles and the sodium and glucose in the beverage can help the body absorb the fluids.
Nutrient Needs at a Glance

Glossary

**Adequate Intake (AI):** set when there is no data to set the RDA

**Acceptable Macronutrient Distribution Range (AMDR):** range of intake for an energy source that reduces risk of chronic disease while providing essential nutrients. Excess leads to weight gain and increased risk of chronic disease.

**Anorexia:** loss of appetite

**Antioxidant:** a substance that prevents the deterioration or rancidity of fats

**Ataxia:** inability to coordinate voluntary muscles

**Cachexia:** general physical wasting and malnutrition

**Cheilosis:** cracks at the corner of the mouth

**Coenzyme:** compound that forms the actual part in an enzyme after combining with a protein component

**Daily Values: (DVs):** the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA)

**Dermatitis:** inflammation of the skin

**Desquamation:** loss of a layer of skin

**Dietary Reference Intakes (DRIs):** general term for a set of reference values for planning and assessing nutrient intakes of healthy people

**Eczema:** an inflammatory condition of the skin characterized by redness and itching

**Edema:** abnormal accumulation of fluid in the body

**Glucose Tolerance Factor (GTF):** a dietary agent that facilitates the reaction of insulin

**Gram (g):** metric unit of mass equal to one thousandth (10⁻³) of a kilogram

**Hemorrhagic:** loss of blood from blood vessels

**Ketosis:** a condition caused by abnormal burning of fat in the body

**Macronutrients:** nutrients—proteins, fats, carbohydrates, others—needed by the body in large amounts

**Microgram (µg - mcg):** one millionth of a gram

**Milligram (mg):** one thousandth of a gram

**Neural Tube Defects (NTD):** birth defects due to failure of the neural tube to develop properly during fetal development

**Osteomalacia:** softening of bones in adults

**Osteoporosis:** porous, brittle bones

**Photophobia:** sensitivity to light

**Recommended Dietary Allowances (RDA):** the amount of nutrients needed to promote good growth and optimum health in people ages 25 to 50

**Rickets:** bone deformation in children

**Scurvy:** weakened cartilages and connective tissue

**Tolerable Upper Intake Level (UL):** highest daily intake that will not cause adverse effects

**Xerophthalmia:** an eye condition that can lead to blindness

References


Revised by Mary Kinney Bielamowicz, PhD, RD, LD, Regents Fellow, Professor and Extension Nutrition Specialist, and Sharon F. Robinson, PhD, RD, LD, Associate Professor and Extension Nutrition Specialist, The Texas A&M System, assisted by Dietetic Interns Kelsey Kinsella, Misty Cram, Kelly Vaughan, 2009; Molly Cernosek, 2011.
<table>
<thead>
<tr>
<th>Nutrients (macro*)</th>
<th>Age range</th>
<th>RDA* (bold)/AI*</th>
<th>AMDR*</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>M + F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein (g/d)</td>
<td>1–8 years</td>
<td>13–19</td>
<td>13–19</td>
<td>5–30</td>
<td>Builds and repairs all body tissue</td>
<td>Animal protein: meat, fish, poultry, eggs, milk, cheese, yogurt</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>34–52</td>
<td>34–46</td>
<td>10–30</td>
<td>Helps build blood</td>
<td>Vegetable protein: legumes (peas, beans), whole grain breads and cereals, nuts, peanut butter, soy</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>56</td>
<td>46</td>
<td>10–35</td>
<td>Helps form antibodies to fight infection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>56</td>
<td>46</td>
<td>10–35</td>
<td>Supplies food energy at 4 calories per gram</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>M + F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat (g/d)</td>
<td>1–8 years</td>
<td>–</td>
<td>–</td>
<td>25–40</td>
<td>Supplies 9 calories per gram (more energy in a small amount of food)</td>
<td>Butter, margarine, shortening, oil, salad dressing, palm and coconut oil, egg yolk, meat with fat, whole milk, cheese, peanut butter</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>–</td>
<td>–</td>
<td>25–35</td>
<td>Transports fat-soluble vitamins and essential fatty acids needed for body’s proper use and storage of fat</td>
<td>Eczema*, retarded growth, diarrhea, loss of hair</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>–</td>
<td>–</td>
<td>25–35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>–</td>
<td>–</td>
<td>20–35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbohydrates (g/d)</td>
<td>1–8 years</td>
<td>130**</td>
<td>130**</td>
<td>45–65</td>
<td>Supply energy at 4 calories per gram to all body cells</td>
<td>Breads, cereals, fruits, cornmeal, rice, macaroni, noodles, spaghetti, Irish and sweet potatoes, corn, dried fruits, bananas, sugar, syrup, jam, jellies, preserves, honey</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>130**</td>
<td>130**</td>
<td>45–65</td>
<td>Supply glucose to spare protein</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>130**</td>
<td>130**</td>
<td>45–65</td>
<td>Help the body use other nutrients</td>
<td></td>
</tr>
<tr>
<td>Fiber (g/d)</td>
<td>1–8 years</td>
<td>14–20</td>
<td>14–17</td>
<td>None determined</td>
<td>May help lower cholesterol</td>
<td>Whole grains (wheat, unenriched rice, oats) or enriched products: cereals, bread, noodles, tortillas, brown rice, oatmeal</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>25–31</td>
<td>22–25</td>
<td></td>
<td>Improves bowel motility</td>
<td>Vegetables: broccoli, spinach, carrots, beans, peas</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>31–34</td>
<td>25–28</td>
<td></td>
<td>Gives feeling of fullness without extra calories, promoting satiety and weight loss</td>
<td>Diarrhea; excess fiber makes bulk, which may prevent eating enough food energy or nutrients; high-fiber diets for elderly, very young or those on low-calorie diets may cause nutrient deficiencies</td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>28</td>
<td>22</td>
<td></td>
<td>Contains phytic acids that tie up minerals, which can prevent absorption</td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td>1–8 years</td>
<td>15–25</td>
<td>15–25</td>
<td>400–650</td>
<td>Helps wounds heal</td>
<td>All citrus fruits, fruit juices, strawberries, cantaloupe; green or red peppers, raw cabbage, spinach, broccoli, turnip greens, collards, mustard greens, kale, tomatoes, Irish or sweet potatoes</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>45–75</td>
<td>45–65</td>
<td>1,200–1,800</td>
<td>Promotes iron absorption</td>
<td>Scurvy*, sore or bleeding gums, poor wound healing, pain in joints, bones, muscles</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>90</td>
<td>75</td>
<td>2,000</td>
<td>Helps the body maintain collagen (fibrous part of protein cell structure)</td>
<td>Poor appetite, constipation, depression, apathy, cachexia*, edema*, cardiac failure, cheliosis*</td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>90</td>
<td>75</td>
<td>2,000</td>
<td>Acts as an antioxidant</td>
<td></td>
</tr>
<tr>
<td>Vitamin B₁₂ – Thiamin (mg/d)</td>
<td>1–8 years</td>
<td>0.5–0.6</td>
<td>0.5–0.6</td>
<td>None determined</td>
<td>Helps the body use carbohydrates for energy</td>
<td>Meat (especially pork), liver, heart, kidney, poultry, eggs, milk, dried peas and beans, nuts, whole-grain or enriched bread and cereals</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>0.9–1.2</td>
<td>0.9–1.0</td>
<td></td>
<td>Maintains appetite and muscle tone</td>
<td>Poor appetite, constipation, depression, apathy, cachexia*, edema*, cardiac failure, cheliosis*</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>1.2</td>
<td>1.1</td>
<td></td>
<td>Involved in nervous system function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>1.2</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B₁₂ – Riboflavin (mg/d)</td>
<td>1–8 years</td>
<td>0.5–0.6</td>
<td>0.5–0.6</td>
<td>None determined</td>
<td>Functions as a part of a coenzyme* that assists in energy release</td>
<td>Milk, cheese, ice cream, organ meats, eggs, fish, dark green leafy vegetables, enriched breads and cereals</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>0.9–1.3</td>
<td>0.9–1.0</td>
<td></td>
<td>Helps in metabolism of amino acids</td>
<td>Cheliosis*, scaly desquamation* around nose and ears, sore tongue and mouth, burning and itching eyes, photophobia*</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicin (mg/d NE*)</td>
<td>1–8 years</td>
<td>6–8</td>
<td>6–8</td>
<td>10–15</td>
<td>Helps wounds heal</td>
<td>All citrus fruits, fruit juices, strawberries, cantaloupe; green or red peppers, raw cabbage, spinach, broccoli, turnip greens, collards, mustard greens, kale, tomatoes, Irish or sweet potatoes</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>12–16</td>
<td>12–14</td>
<td>20–30</td>
<td>Promotes normal appetite</td>
<td>Poor appetite, constipation, depression, apathy, cachexia*, edema*, cardiac failure, cheliosis*</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>16</td>
<td>14</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>16</td>
<td>14</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B₁ (mg/d)</td>
<td>1–8 years</td>
<td>0.5–0.6</td>
<td>0.5–0.6</td>
<td>30–40</td>
<td>Helps protein utilization</td>
<td>Meat, poultry, fish, sweet potatoes, vegetables, whole grains, fortified cereals</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>1.0–1.3</td>
<td>1.0–1.2</td>
<td>60–80</td>
<td>Helps convert the amino acid tryptophan to the vitamin Nicin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>1.3</td>
<td>1.3</td>
<td>100</td>
<td>Helps convert complex carbohydrates to simple carbohydrates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>1.7</td>
<td>1.5</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choline (mg/d)</td>
<td>1–8 years</td>
<td>200–250</td>
<td>200–250</td>
<td>1,000</td>
<td>Plays a role in cell structure in lipids in the cell membranes</td>
<td>Egg yolks, milk, peanuts, soy, wheat germ, livers (beef, veal and turkey)</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>375–500</td>
<td>375–400</td>
<td>2,000–3,000</td>
<td>Promotes brain and memory functions</td>
<td>When low during pregnancy, an increased risk of birth defects; low choline leads to increased risk of cardiovascular disease</td>
</tr>
<tr>
<td></td>
<td>19–50 years</td>
<td>550</td>
<td>425</td>
<td>3,500</td>
<td>Gives to own manufacture in the body</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–70 years</td>
<td>550</td>
<td>425</td>
<td>3,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B₁₂ (µg/d)</td>
<td>1–8 years</td>
<td>0.9–1.2</td>
<td>0.9–1.2</td>
<td>None determined</td>
<td>Helps maintain nerve tissue and normal blood formation</td>
<td>Animal foods: organ meats, muscle meats, fish, poultry, eggs, milk, fortified cereals</td>
</tr>
<tr>
<td></td>
<td>9–18 years</td>
<td>1.8–2.4</td>
<td>1.8–2.4</td>
<td></td>
<td>Regeneration of folate</td>
<td>Anemia, neurologic disorders</td>
</tr>
</tbody>
</table>
### Fat-soluble vitamins

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>RDA*/AI*</th>
<th>UL*</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (µg/d RAE*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retinol, Retinyl Palmitate</td>
<td>1–8 years: 300–900, 9–18 years: 600–900, 19–50 years: 1,200–2,400</td>
<td>None determined</td>
<td>• Promotes growth and normal vision, and protects against night blindness</td>
<td>Dark leafy green or deep yellow vegetables, carrots, winter squash, squash, pumpkin, sweet potatoes; yellow fruits (peaches, cantaloupe, apricots); liver, fish, liver oils, dairy foods, butter, margarine, egg yolks</td>
<td>Faulty bone and tooth development in infants, poor growth, xerophthalmia*, night blindness</td>
</tr>
<tr>
<td>*Retinol Activity</td>
<td></td>
<td></td>
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<tr>
<td>Equivalent: 1 RAE = 1 µg Retinol</td>
<td></td>
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</tr>
<tr>
<td>Vitamin D (iu/d)</td>
<td>1–8 years: 400, 9–18 years: 600, 19–50 years: 800, 51–70 years: 1,000</td>
<td>None determined</td>
<td>• Synthesized in skin by ultraviolet light</td>
<td>Fish liver oils and flesh, fortified milk, exposure to sunlight. Minute amounts in butter, liver, egg yolk, salmon and sardines</td>
<td>Rickets* (soft, fragile bones, enlarged joints, bowed legs); chest, spinal and pelvic bone deformities; convulsions; osteomalacia*</td>
</tr>
<tr>
<td>Vitamin E (mg/d)</td>
<td>1–8 years: 6–7, 9–18 years: 11–15, 19–50 years: 15, 51–70 years: 15</td>
<td>None determined</td>
<td>• Not stored in body to any extent</td>
<td>Plant tissues: wheat or rice germ, vegetable oils, green leafy vegetables, nuts, legumes; meats (other animal foods are poor sources)</td>
<td>Anemia in premature infants, problems of nervous system</td>
</tr>
<tr>
<td>Alpha*, beta-, gamma-tocopherol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin K (µg/d)</td>
<td>1–8 years: 30–55, 9–18 years: 60–75, 19–50 years: 120, 51–70 years: 120</td>
<td>None determined</td>
<td>• Bile is necessary for absorption of the vitamin</td>
<td>Deep green leaves (alfalfa, spinach, cabbage), liver, egg yolk, butterfat, (is synthesized in intestine by beneficial bacteria)</td>
<td>Prolonged clotting time, hemorrhagic* disease in newborn infants</td>
</tr>
<tr>
<td>Phylloquinone (K)</td>
<td></td>
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<tr>
<td>Menadione</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Minerals/Elements</td>
<td>RDA*/AI*</td>
<td>UL*</td>
<td>Functions in the body</td>
<td>Sources</td>
<td>Deficiency</td>
</tr>
<tr>
<td>Calcium (mg/d)</td>
<td>1–8 years: 700–1,000, 9–18 years: 1,300, 19–50 years: 1,700, 51–70 years: 2,500</td>
<td>None determined</td>
<td>• Needed to build bones and teeth; helps clot blood</td>
<td>Milk, cheese, ice cream, greens (kale, broccoli, collards, turnips, mustard), dried peas and beans, fortified juice, soy milk</td>
<td>Retarded bone mineralization, fragile bones, rickets*, osteomalacia*, osteoporosis*</td>
</tr>
<tr>
<td>Chromium (µg/d)</td>
<td>1–8 years: 11–15, 9–18 years: 25–35, 19–50 years: 35, 51–70 years: 30</td>
<td>None determined</td>
<td>• Works along with insulin in carbohydrate, protein and fat metabolism; glucose tolerance factor (GTF)*</td>
<td>Brewer's yeast, liver, meat, cheese, whole-grain cereals, broccoli</td>
<td>Inability of cells to use glucose for energy</td>
</tr>
<tr>
<td>Copper (µg/d)</td>
<td>1–8 years: 340–440, 9–18 years: 700–890, 19–50 years: 900, 51–70 years: 900</td>
<td>None determined</td>
<td>• Aids absorption and use of iron to form hemoglobin in red blood cells</td>
<td>Liver, shellfish, meats, nuts, legumes, whole-grain cereals</td>
<td>Anemia</td>
</tr>
<tr>
<td>Fluoride (mg/d)</td>
<td>1–8 years: 0.7–1, 9–18 years: 2–3, 19–50 years: 4, 51–70 years: 4</td>
<td>None determined</td>
<td>• Makes teeth resistant to decay; most effective in young children</td>
<td>Water (1 part per million is added to some municipal water supplies)</td>
<td>None known</td>
</tr>
<tr>
<td>Iodine (µg/d)</td>
<td>1–8 years: 90, 9–18 years: 120–150, 19–50 years: 150, 51–70 years: 150</td>
<td>None determined</td>
<td>• Integral part of thyroid hormones: thyroxine and triiodothyronine</td>
<td>Iodized table salt (76 µg/g of salt), seafood, plants grown in iodine-rich soils, dairy products</td>
<td>Cretinism (stunted growth with mental retardation); endemic goiter</td>
</tr>
<tr>
<td>Iron (mg/d)</td>
<td>1–8 years: 7–10, 9–18 years: 8–11, 19–50 years: 8, 50–70 years: 8</td>
<td>None determined</td>
<td>• Part of blood hemoglobin and myoglobin</td>
<td>Liver, organ meats, meat, poultry, egg yolk, enriched and whole-grain breads, cereals, legumes, dark green vegetables, black strap mollases, peaches, apricots, raisins, prunes, oysters</td>
<td>Anemia (frequent in infants, preschool children, teenage girls and pregnant women)</td>
</tr>
</tbody>
</table>
### Electrolytes

<table>
<thead>
<tr>
<th>Electrolytes</th>
<th>RDA*/AI*</th>
<th>UL*</th>
<th>Functions in the body</th>
<th>Sources</th>
<th>Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (g/d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–8 years</td>
<td>1–1.2</td>
<td>1–1.2</td>
<td>1.5–1.9</td>
<td>Table salt, cheddar cheese, ham, snack foods, most processed foods, salt (sodium chloride) and sodium benzoate/phosphate are added</td>
<td>Fatigue caused by profuse sweating, vomiting and diarrhea</td>
</tr>
<tr>
<td>9–18 years</td>
<td>1.5</td>
<td>1.5</td>
<td>2.2–2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19–50 years</td>
<td>1.5</td>
<td>1.5</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70 years</td>
<td>1.3</td>
<td>1.3</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloride (g/d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–8 years</td>
<td>1.5–1.9</td>
<td>1.5–1.9</td>
<td>2.3–2.9</td>
<td>Table salt (sodium chloride), barley, wheat, green leafy vegetables, melon, pineapple</td>
<td>Heat cramps, hair loss, tooth loss</td>
</tr>
<tr>
<td>9–18 years</td>
<td>2.3</td>
<td>2.3</td>
<td>3.4–3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19–50 years</td>
<td>2.3</td>
<td>2.3</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70 years</td>
<td>2</td>
<td>2</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium (g/d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–8 years</td>
<td>3–3.8</td>
<td>3–3.8</td>
<td>None determined</td>
<td>Bananas, orange juice, most fruits, potatoes, dried peas, peanuts, nuts, dairy products, and meats</td>
<td>Weakness, poor muscle tone, heart abnormalities, apathy (lack of energy)</td>
</tr>
<tr>
<td>9–18 years</td>
<td>4.5–4.7</td>
<td>4.5–4.7</td>
<td>None determined</td>
<td></td>
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<tr>
<td>19–50 years</td>
<td>4.7</td>
<td>4.7</td>
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</tr>
<tr>
<td>51–70 years</td>
<td>4.7</td>
<td>4.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water (liters/day)</td>
<td></td>
<td></td>
<td></td>
<td>Water, juices, beverages, high-moisture solid foods (soups, watermelon, meats, etc.)</td>
<td>Dehydration, constipation</td>
</tr>
</tbody>
</table>

* See Glossary for definitions
**Average minimum amounts of glucose used by brain
***Supplement during pregnancy of 400 µg or mcg folic acid plus folate intake of a varied diet

1 NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan
2 RAE = Retinol activity equivalents. 1 retinol equivalent = 1 µg retinol or 6 µg beta-carotene
3 α-tocopherol includes the only form (RRR-α-tocopherol) that occurs naturally in foods and with variations of this form in fortified foods and supplements.
4 Estimated sodium and potassium minimum requirements. AI* has been set for healthy individuals and the UL* may be too high for persons with hypertension.
NUTRITIOUS SNACKS

Snacks can help us meet the nutritional needs that may otherwise go unmet if only consuming three meals per day. Nutrient intake can be improved by including healthy snacks as part of your daily schedule. Learning about proper nutrition and how to read a nutrition facts label can help you make healthy snacking choices.

Key Terms
- **Cost per Serving** – The cost of one serving of a food item. The cost per serving can be determined by dividing the total cost of a food package by the number of servings indicated on the nutrition facts label.
  \[ \text{Total cost} / \text{Total Number of Servings} = \text{Cost per Serving} \]
- **Daily Values (DVs)** – The amount of a nutrient needed daily as determined by the Food and Drug Administration.
- **Fiber** – the part of plant foods that cannot be digested. Fiber is beneficial because it reduces the risk of coronary heart disease, reduces constipation and promotes a full feeling.
- **Food Group** – The basic food groups are grains, fruits, vegetables, dairy, and protein.
- **Nutrients** – Substances the body needs to grow and function. The six classes of nutrients are: carbohydrates, protein, fats, water, vitamins and minerals. Carbohydrates, protein and fats are the only three nutrients that provide calories.
- **Nutrient-Dense Foods** – Those that provide substantial amounts of vitamins and minerals and relatively fewer calories.
- **Portion Size** – the amount of food eaten at one time.
- **Serving Size** – A standardized amount of a food, such as a cup or an ounce, used in providing dietary guidance or in making comparisons among similar foods.
- **Whole Grains** – Foods made from the entire grain seed, usually called the kernel, which consists of the bran, germ and endosperm. Nutrients found in whole grains offer protective health benefits such as reducing constipation, aiding in weight management and reducing the risk of heart disease.

Reading Labels When Making Snack Choices
To know what you’re getting from your snack, be sure to read the nutrition facts label. Try these tips to make smart food choices quickly and easily.
- Keep these low: calories, saturated fats, trans fat, cholesterol and sodium
- Get enough of these: potassium, fiber, vitamins A and C, calcium and iron Check for added sugars using the ingredient list.
- Use the % Daily Value (DV) column when possible: 5% DV or less is low, 20% DV or more is high

Additional items to look for on a Nutrition Facts Label include:
- **Serving size**: Look at the serving size and the number of servings per package. Then, determine how many servings you are actually consuming. If you double the servings you eat, you double the calories and nutrients. Remember, the serving size provided on the nutrition facts label is not a recommended amount to eat; it’s a way to let you know the calories and nutrients in a certain amount of food.
- **Calories**: 2,000 calories is the value used as a general reference on the food label. However, the amount of calories you need each day depends on your age, gender, activity level and whether you are trying to gain, maintain or lose weight. Be sure to look at the serving size and how many servings you are actually consuming. If you double the servings you eat, you double the calories.

You can easily consume your calories on a few high-calorie food items, but you most likely will not get the vitamins and nutrients your body needs. Instead, choose nutrient-rich foods that are packed with vitamins, minerals, fiber and other nutrients but are lower in calories.

Look at the calories on the label and compare them with what nutrients you are also getting to decide whether the food is worth eating. When one serving of a single food items contains 400 or more calories, it is high; 40 calories is low.
Food packages also contain information about the amount of calories in the food, including various claims, such as:

- **Calorie free** – means there is less than 5 calories per serving.
- **Low calorie** – means there is 40 calories or less per serving.
- **Reduced calorie or lower in calories** – means there is at least 25 percent fewer calories than the regular version.
- **Light or lite** – means there is half the fat or a third of the calories of the regular version.

**Remember that calories come from both food and beverages, so make your calories count!**

- **Sugars**: Since sugars contribute calories with few, if any, nutrients, look for foods and beverages low in added sugars. The Nutrition Facts label lists how many grams of sugar the food contains, but does not list added sugars separately. The amount listed includes sugars that are naturally present in foods and sugars added to the food during processing or preparation. Although the body's response to sugars does not depend on whether they are naturally present in food or added to foods, sugars found naturally in foods are part of the food's total package of nutrients and other healthful components. In contrast, many foods that contain added sugars often supply calories, but few or no essential nutrients and no dietary fiber.

  Read the ingredient list and make sure that added sugars are not one of the first few ingredients. Some names for added sugars (caloric sweeteners) include sucrose, glucose, high fructose corn syrup, corn syrup, corn sweetener, honey, dextrose, fruit juice concentrates, lactose, maltose, malt syrup, molasses, maple syrup and fructose. These added sugars provide calories but few or no vitamins and minerals.

  The food package can also provide guidance. Sometimes the label will say “sugar-free” or “no added sugars.” Even with these claims, it is important to read the Nutrition Facts label.

- **Fats**: Look for foods low in saturated fats, trans fats and cholesterol to help reduce the risk of heart disease. Most of the fats you eat should be polyunsaturated and monounsaturated fats. There is no % DV for trans fat, but you should aim to keep trans fat intake as low as possible. Remember, keep your total fat intake between 20% to 35% of calories (25% to 35% for children and adolescents 4 to 18 years of age). Foods that are high in fats are usually high in calories.

  Many food packages also contain various claims regarding the amount of fat in the food. Some examples of these claims are “fat free,” “low saturated fat” or “light.”

- **Sodium**: Sodium is an essential nutrient and is needed by the body in relatively small quantities, provided that substantial sweating does not occur. Reducing sodium intake can reduce one's blood pressure. Keeping blood pressure in normal range reduces an individual’s risk of cardiovascular disease, congestive heart failure, and kidney disease.

  The adequate intake (AI) levels of sodium for individuals ages 9 to 50 years is 1,500 mg per day. For adolescents and adults of all ages (14 years and older), the tolerable upper intake level is 2,300 mg per day. Research shows that eating less than 2,300 milligrams of sodium (about 1 tsp of salt) per day may reduce the risk of high blood pressure. Most of the sodium people eat comes from processed foods, not from the salt shaker. Take a look at the sodium content on the Nutrition Facts label, using it to make selections that are lower in sodium. Use the % DV to determine the levels of sodium in the food product – 5% DV or less is low and 20% DV or more is considered high.

  Claims on the food packaging, such as “low sodium,” can also be used to quickly identify foods that contain less salt. However, such claims should still prompt a look at the Nutrition Facts label.

**Nutritious Snacking Tips**

- Choose foods high in nutrients and low in fat.
- Eat snacks that include at least two food groups. For example, pair apple slices with cheese or a mini bagel with peanut butter.
- Plan ahead! Plan and pack snacks for when you are on the go so you can avoid less healthful snack choices such as chips and soda.
- Incorporate fruits and vegetables into your snacking plans.
- Aim for whole grain snacks, as at least half of your grains should be whole.
- Remember that calories come from both food and beverages. Water and milk are your best beverage choices at snack time.
References and Resources

www.choosemyplate.gov


Dietary Guidelines for Americans, 2010
Emergency Preparedness Information

Wildfires

Basic Safety Tips
- If you see a wildfire and haven't received evacuation orders yet, call 9-1-1. Don't assume that someone else has already called.
- If ordered to evacuate during a wildfire, do it immediately- make sure and tell someone where you are going and when you have arrived.
- Many communities have text or email alerting systems for emergency notifications. To find out what alerts are available in your area, search the Internet with your town, city, or county name and the word "alerts."
- If you or someone you are with has been burned, call 9-1-1 or seek help immediately; cool and cover burns to reduce chance of further injury or infection.

Fire Weather Watch
Fire weather watch = dangerous fire weather conditions are possible over the next 12 to 72 hours

Steps to Take
- Turn on your TV/radio. You'll get the latest weather updates and emergency instructions.
- Know where to go. If you are ordered to evacuate, know the route to take and have plan of where you will go. Check-in with your friends and family.
- Keep your car fueled, in good condition, and stocked with emergency supplies and a change of clothes.

Prepare Your Home
- Regularly clean the roof and gutters.
- Maintain an area approximately 30' away from your home that is free of anything that will burn, such as wood piles, dried leaves, newspapers and other brush.
- Connect garden hoses long enough to reach any area of the home and fill garbage cans, tubs, or other large containers with water.
- Review your homeowner's insurance policy and also prepare/update a list of your home's contents.

After a Wildfire
- Returning Home
  - Return home only when authorities say it is safe.
  - For several hours after the fire, maintain a "fire watch." Check and re-check for smoke, sparks or hidden embers throughout the house, including the roof and the attic.
  - Use caution when entering burned areas as hazards may still exist, including hot spots, which can flare up without warning. Evacuate immediately if you smell smoke.
- Cleaning Your Home
- Wear a NIOSH certified-respirator (dust mask) and wet debris down to minimize breathing dust particles.
- Discard any food that has been exposed to heat, smoke or soot.
- Do NOT use water that you think may be contaminated to wash dishes, brush teeth, prepare food, wash hands, or to make ice or baby formula.
- Photograph damage to your property for insurance purposes.

Before Wildfire season - Make a Wildfire plan
- Know your wildfire risk.
- Make a wildfire emergency plan.
Build or restock your emergency preparedness kit, including a flashlight, batteries, cash, and first aid supplies.

Familiarize yourself with local emergency plans. Know where to go and how to get there should you need to get to higher ground, the highest level of a building or to evacuate.

Stay tuned to your phone alerts, TV, or radio, for weather updates, emergency instructions or evacuation orders.

**Tornadoes**

Tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. Every state is at some risk from this hazard. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

**Before a Tornado**

- To begin preparing, you should build an emergency kit and make a family communications plan.
- Listen to NOAA Weather Radio or to commercial radio or television newscasts for the latest information. In any emergency, always listen to the instructions given by local emergency management officials.
- Be alert to changing weather conditions. Look for approaching storms.
- Look for the following danger signs:
  - Dark, often greenish sky
  - Large hail
  - A large, dark, low-lying cloud (particularly if rotating)
  - Loud roar, similar to a freight train.
  - If you see approaching storms or any of the danger signs, be prepared to take shelter immediately.

**Tornado Facts**

Quick facts you should know about tornadoes:

- They may strike quickly, with little or no warning.
- They may appear nearly transparent until dust and debris are picked up or a cloud forms in the funnel.
- The average tornado moves Southwest to Northeast, but tornadoes have been known to move in any direction.
- The average forward speed of a tornado is 30 mph, but may vary from stationary to 70 mph.
- Tornadoes can accompany tropical storms and hurricanes as they move onto land.
- Waterspouts are tornadoes that form over water.
- Tornadoes are most frequently reported east of the Rocky Mountains during spring and summer months.
- Peak tornado season in the southern states is March through May; in the northern states, it is late spring through early summer.
- Tornadoes are most likely to occur between 3 pm and 9 pm, but can occur at any time.

**Know the Terms**

Familiarize yourself with these terms to help identify a tornado hazard:

- Tornado Watch - Tornadoes are possible. Remain alert for approaching storms. Watch the sky and stay tuned to NOAA Weather Radio, commercial radio or television for information.
- **Tornado Warning** - A tornado has been sighted or indicated by weather radar. Take shelter immediately.

**During a Tornado**
If you are under a tornado warning, seek shelter immediately! Most injuries associated with high winds are from flying debris, so remember to protect your head.

<table>
<thead>
<tr>
<th>If you are in:</th>
<th>Then:</th>
</tr>
</thead>
</table>
| A structure (e.g. residence, small building, school, nursing home, hospital, factory, shopping center, high-rise building) | - Go to a pre-designated area such as a safe room, basement, storm cellar, or the lowest building level. If there is no basement, go to the center of a small interior room on the lowest level (closet, interior hallway) away from corners, windows, doors, and outside walls. Put as many walls as possible between you and the outside. Get under a sturdy table and use your arms to protect your head and neck.  
  - In a high-rise building, go to a small interior room or hallway on the lowest floor possible.  
  - Put on sturdy shoes.  
  - Do not open windows. |
| A manufactured home or office           | - Get out immediately and go to a pre-identified location such as the lowest floor of a sturdy, nearby building or a storm shelter. Mobile homes, even if tied down, offer little protection from tornadoes. |
| The outside with no shelter             | If you are not in a sturdy building, there is no single research-based recommendation for what last-resort action to take because many factors can affect your decision. Possible actions include:  
  - Immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy shelter. If your vehicle is hit by flying debris while you are driving, pull over and park.  
  - Take cover in a stationary vehicle. Put the seat belt on and cover your head with your arms and a blanket, coat or other cushion if possible.  
  - Lie in an area noticeably lower than the level of the roadway and cover your head with your arms and a blanket, coat or other cushion if possible.  
In all situations:  
  - Do not get under an overpass or bridge. You are safer in a low, flat location.  
  - Never try to outrun a tornado in urban or congested areas in a car or truck. Instead, leave the vehicle immediately for safe shelter.  
  - Watch out for flying debris. Flying debris from tornadoes causes most fatalities and injuries. |
**Thunderstorms & Lightning**

All thunderstorms are dangerous. Every thunderstorm produces lightning. While lightning fatalities have decreased over the past 30 years, lightning continues to be one of the top three storm-related killers in the United States. On average in the U.S., lightning kills 51 people and injures hundreds more. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms.

Other associated dangers of thunderstorms include tornadoes, strong winds, hail and flash flooding. Flash flooding is responsible for more fatalities – more than 140 annually – than any other thunderstorm-associated hazard. Dry thunderstorms that do not produce rain that reaches the ground are most prevalent in the western United States. Falling raindrops evaporate, but lightning can still reach the ground and can start wildfires.

**Before Thunderstorm and Lightning**

To prepare for a thunderstorm, you should do the following:

- To begin preparing, you should [build an emergency kit](#) and [make a family communications plan](#).
- Remove dead or rotting trees and branches that could fall and cause injury or damage during a severe thunderstorm.
- Postpone outdoor activities.
- Secure outdoor objects that could blow away or cause damage.
- Get inside a home, building, or hard top automobile (not a convertible). Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.
- Remember, rubber-soled shoes and rubber tires provide NO protection from lightning. However, the steel frame of a hard-topped vehicle provides increased protection if you are not touching metal.
- Shutter windows and secure outside doors. If shutters are not available, close window blinds, shades or curtains.
- Unplug any electronic equipment well before the storm arrives.

**Lightning Risk Reduction When Outdoors**

<table>
<thead>
<tr>
<th>If you are:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a forest</td>
<td>Seek shelter in a low area under a thick growth of small trees.</td>
</tr>
<tr>
<td>In an open area</td>
<td>Go to a low place such as a ravine or valley. Be alert for flash floods.</td>
</tr>
<tr>
<td>On open water</td>
<td>Get to land and find shelter immediately.</td>
</tr>
</tbody>
</table>

**Facts about Thunderstorms**

- They may occur singly, in clusters or in lines.
- Some of the most severe occur when a single thunderstorm affects one location for an extended time.
- Thunderstorms typically produce heavy rain for a brief period, anywhere from 30 minutes to an hour.
- Warm, humid conditions are highly favorable for thunderstorm development.
- About 10 percent of thunderstorms are classified as severe – one that produces hail at least an inch or larger in diameter, has winds of 58 miles per hour or higher or produces a [tornado](#).

**Facts about Lightning**

- Lightning’s unpredictability increases the risk to individuals and property.
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.
• “Heat lightning” is actually lightning from a thunderstorm too far away from thunder to be heard. However, the storm may be moving in your direction.
• Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
• Your chances of being struck by lightning are estimated to be 1 in 600,000 but could be reduced even further by following safety precautions.
• Lightning strike victims carry no electrical charge and should be attended to immediately.

During Thunderstorms and Lightning:
If thunderstorm and lightning are occurring in your area, you should:
• Use your battery-operated NOAA Weather Radio for updates from local officials.
• Avoid contact with corded phones and devices including those plugged into electric for recharging. Cordless and wireless phones not connected to wall outlets are OK to use.
• Avoid contact with electrical equipment or cords. Unplug appliances and other electrical items such as computers and turn off air conditioners. Power surges from lightning can cause serious damage.
• Avoid contact with plumbing. Do not wash your hands, do not take a shower, do not wash dishes, and do not do laundry. Plumbing and bathroom fixtures can conduct electricity.
• Stay away from windows and doors, and stay off porches.
• Do not lie on concrete floors and do not lean against concrete walls.
• Avoid natural lightning rods such as a tall, isolated tree in an open area.
• Avoid hilltops, open fields, the beach or a boat on the water.
• Take shelter in a sturdy building. Avoid isolated sheds or other small structures in open areas.
• Avoid contact with anything metal—tractors, farm equipment, motorcycles, golf carts, golf clubs, and bicycles.
• If you are driving, try to safely exit the roadway and park. Stay in the vehicle and turn on the emergency flashers until the heavy rain ends. Avoid touching metal or other surfaces that conduct electricity in and outside the vehicle.

After a Thunderstorm or Lightning Strike
If lightning strikes you or someone you know, call 9-1-1 for medical assistance as soon as possible. The following are things you should check when you attempt to give aid to a victim of lightning:
• **Breathing** - if breathing has stopped, begin mouth-to-mouth resuscitation.
• **Heartbeat** - if the heart has stopped, administer CPR.
• **Pulse** - if the victim has a pulse and is breathing, look for other possible injuries. Check for burns where the lightning entered and left the body. Also be alert for nervous system damage, broken bones and loss of hearing and eyesight.

After the storm passes remember to:
• Never drive through a flooded roadway. Turn around, don't drown!
• Stay away from storm-damaged areas to keep from putting yourself at risk from the effects of severe thunderstorms.
• Continue to listen to a NOAA Weather Radio or to local radio and television stations for updated information or instructions, as access to roads or some parts of the community may be blocked.
• Help people who may require special assistance, such as infants, children and the elderly or those with access or functional needs.
• Stay away from downed power lines and report them immediately.
• Watch your animals closely. Keep them under your direct control.

All information taken from: [www.ready.gov/texas](http://www.ready.gov/texas)
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Familiarize yourself with these terms to help identify a tornado hazard:
• Tornado Watch - Tornadoes are possible. Remain alert for approaching storms. Watch the sky and stay tuned to NOAA Weather Radio, commercial radio or television for information.
**Tornado Warning** - A tornado has been sighted or indicated by weather radar. Take shelter immediately.

**During a Tornado**
If you are under a tornado warning, seek shelter immediately! Most injuries associated with high winds are from flying debris, so remember to protect your head.

<table>
<thead>
<tr>
<th>If you are in:</th>
<th>Then:</th>
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</table>
| A structure (e.g. residence, small building, school, nursing home, hospital, factory, shopping center, high-rise building) | • Go to a pre-designated area such as a safe room, basement, storm cellar, or the lowest building level. If there is no basement, go to the center of a small interior room on the lowest level (closet, interior hallway) away from corners, windows, doors, and outside walls. Put as many walls as possible between you and the outside. Get under a sturdy table and use your arms to protect your head and neck.  
  • In a high-rise building, go to a small interior room or hallway on the lowest floor possible.  
  • Put on sturdy shoes.  
  • Do not open windows. |
| A manufactured home or office          | • Get out immediately and go to a pre-identified location such as the lowest floor of a sturdy, nearby building or a storm shelter. Mobile homes, even if tied down, offer little protection from tornadoes. |
| The outside with no shelter            | If you are not in a sturdy building, there is no single research-based recommendation for what last-resort action to take because many factors can affect your decision. Possible actions include:  
  • Immediately get into a vehicle, buckle your seat belt and try to drive to the closest sturdy shelter. If your vehicle is hit by flying debris while you are driving, pull over and park.  
  • Take cover in a stationary vehicle. Put the seat belt on and cover your head with your arms and a blanket, coat or other cushion if possible.  
  • Lie in an area noticeably lower than the level of the roadway and cover your head with your arms and a blanket, coat or other cushion if possible.  
  In all situations:  
  • Do not get under an overpass or bridge. You are safer in a low, flat location.  
  • Never try to outrun a tornado in urban or congested areas in a car or truck. Instead, leave the vehicle immediately for safe shelter.  
  • Watch out for flying debris. Flying debris from tornadoes causes most fatalities and injuries. |
**Thunderstorms & Lightning**
All thunderstorms are dangerous. Every thunderstorm produces lightning. While lightning fatalities have decreased over the past 30 years, lightning continues to be one of the top three storm-related killers in the United States. On average in the U.S., lightning kills 51 people and injures hundreds more. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms.

Other associated dangers of thunderstorms include tornadoes, strong winds, hail and flash flooding. Flash flooding is responsible for more fatalities – more than 140 annually – than any other thunderstorm-associated hazard. Dry thunderstorms that do not produce rain that reaches the ground are most prevalent in the western United States. Falling raindrops evaporate, but lightning can still reach the ground and can start wildfires.

**Before Thunderstorm and Lightning**
To prepare for a thunderstorm, you should do the following:
- To begin preparing, you should build an emergency kit and make a family communications plan.
- Remove dead or rotting trees and branches that could fall and cause injury or damage during a severe thunderstorm.
- Postpone outdoor activities.
- Secure outdoor objects that could blow away or cause damage.
- Get inside a home, building, or hard top automobile (not a convertible). Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.
- Remember, rubber-soled shoes and rubber tires provide NO protection from lightning. However, the steel frame of a hard-topped vehicle provides increased protection if you are not touching metal.
- Shutter windows and secure outside doors. If shutters are not available, close window blinds, shades or curtains.
- Unplug any electronic equipment well before the storm arrives.

**Lightning Risk Reduction When Outdoors**

<table>
<thead>
<tr>
<th>If you are</th>
<th>Then</th>
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<tbody>
<tr>
<td>In a forest</td>
<td>Seek shelter in a low area under a thick growth of small trees.</td>
</tr>
<tr>
<td>In an open area</td>
<td>Go to a low place such as a ravine or valley. Be alert for flash floods.</td>
</tr>
<tr>
<td>On open water</td>
<td>Get to land and find shelter immediately.</td>
</tr>
</tbody>
</table>

**Facts about Thunderstorms**
- They may occur singly, in clusters or in lines.
- Some of the most severe occur when a single thunderstorm affects one location for an extended time.
- Thunderstorms typically produce heavy rain for a brief period, anywhere from 30 minutes to an hour.
- Warm, humid conditions are highly favorable for thunderstorm development.
- About 10 percent of thunderstorms are classified as severe – one that produces hail at least an inch or larger in diameter, has winds of 58 miles per hour or higher or produces a tornado.

**Facts about Lightning**
- Lightning’s unpredictability increases the risk to individuals and property.
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.
• “Heat lightning” is actually lightning from a thunderstorm too far away from thunder to be heard. However, the storm may be moving in your direction.
• Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
• Your chances of being struck by lightning are estimated to be 1 in 600,000 but could be reduced even further by following safety precautions.
• Lightning strike victims carry no electrical charge and should be attended to immediately.

**During Thunderstorms and Lightning:**
If thunderstorm and lightning are occurring in your area, you should:
• Use your battery-operated NOAA Weather Radio for updates from local officials.
• Avoid contact with corded phones and devices including those plugged into electric for recharging. Cordless and wireless phones not connected to wall outlets are OK to use.
• Avoid contact with electrical equipment or cords. Unplug appliances and other electrical items such as computers and turn off air conditioners. Power surges from lightning can cause serious damage.
• Avoid contact with plumbing. Do not wash your hands, do not take a shower, do not wash dishes, and do not do laundry. Plumbing and bathroom fixtures can conduct electricity.
• Stay away from windows and doors, and stay off porches.
• Do not lie on concrete floors and do not lean against concrete walls.
• Avoid natural lightning rods such as a tall, isolated tree in an open area.
• Avoid hilltops, open fields, the beach or a boat on the water.
• Take shelter in a sturdy building. Avoid isolated sheds or other small structures in open areas.
• Avoid contact with anything metal—tractors, farm equipment, motorcycles, golf carts, golf clubs, and bicycles.
• If you are driving, try to safely exit the roadway and park. Stay in the vehicle and turn on the emergency flashers until the heavy rain ends. Avoid touching metal or other surfaces that conduct electricity in and outside the vehicle.

**After a Thunderstorm or Lightning Strike**
If lightning strikes you or someone you know, call 9-1-1 for medical assistance as soon as possible. The following are things you should check when you attempt to give aid to a victim of lightning:
• **Breathing** - if breathing has stopped, begin mouth-to-mouth resuscitation.
• **Heartbeat** - if the heart has stopped, administer CPR.
• **Pulse** - if the victim has a pulse and is breathing, look for other possible injuries. Check for burns where the lightning entered and left the body. Also be alert for nervous system damage, broken bones and loss of hearing and eyesight.

After the storm passes remember to:
• Never drive through a flooded roadway. Turn around, don’t drown!
• Stay away from storm-damaged areas to keep from putting yourself at risk from the effects of severe thunderstorms.
• Continue to listen to a NOAA Weather Radio or to local radio and television stations for updated information or instructions, as access to roads or some parts of the community may be blocked.
• Help people who may require special assistance, such as infants, children and the elderly or those with access or functional needs.
• Stay away from downed power lines and report them immediately.
• Watch your animals closely. Keep them under your direct control.

All information taken from: [www.ready.gov/texas](http://www.ready.gov/texas)
Electricity lights up our world!

Think of all the ways we rely on electricity: keeping food fresh, cooking meals, and getting information through the internet or TV. It keeps us warm in the winter, cool in the summer, and connected with each other year round. Oftentimes, we use electricity to play and have fun! Are you and your family ready if disaster strikes and your home is without power?

Help your family build an emergency kit! Collect these items and keep them together in a safe place that you can find easily. Make sure you have enough supplies to last for at least three days.

**Emergency Supplies List**

- 3-day supply of non-perishable food (dried fruit, canned tuna fish, peanut butter, etc.)
- Can opener
- First aid kit
- Sleeping bag or warm blanket for everyone in your family
- Change of clothes to last 3 days, including sturdy shoes; consider the weather where you live
- Matches in a waterproof container (let a grown up handle these)
- Toothbrush, toothpaste, soap
- Paper plates, plastic cups and utensils, paper towels
- Water – at least a gallon per person, per day
- Battery-powered or hand-cranked radio with extra batteries
- Flashlights with extra batteries
- Cell phone with charger, extra battery and solar charger
- Whistle to signal for help
- Local maps
- Pet supplies
- Baby supplies
- Books, games or puzzles
- A favorite stuffed animal or blanket

Remember, traffic lights will not work!

**Go on a quest with your family! Create a scavenger hunt! Make planning fun!**

Skin Cancer Prevention and Early Detection

Skin cancer is the most common cancer in the United States. In fact, more skin cancers are diagnosed in the US each year than all other cancers combined. The number of skin cancer cases has been going up over the past few decades.

The good news is that you can do a lot to protect yourself and your family from skin cancer, or catch it early so that it can be treated effectively. Most skin cancers are caused by too much exposure to ultraviolet (UV) rays. Most of this exposure comes from the sun, but some may come from man-made sources, such as indoor tanning beds and sun lamps.

You don’t need any x-rays or blood tests to find skin cancer early – just your eyes and a mirror. If you have skin cancer, finding it early is the best way to make sure it can be treated with success.

What is skin cancer?

Skin cancer starts in the cells of the skin. Some other types of cancer start in other parts of the body and can spread to the skin, but these are not skin cancers.

There are 3 main types of skin cancers:

• Basal cell skin cancers (basal cell carcinomas)
• Squamous cell skin cancers (squamous cell carcinomas)
• Melanomas

Basal and squamous cell cancers

Basal and squamous cell skin cancers are by far the most common cancers of the skin. Both are found mainly on parts of the body exposed to the sun, such as the head and neck. These cancers are strongly related to a person’s sun exposure.

Basal and squamous cell cancers are much less likely than melanomas to spread to other parts of the body and become life threatening. Still, it’s important to find and treat them early. If left alone, they can grow larger and invade nearby tissues and organs, causing scarring, deformity, or even loss of function in some parts of the body. Some of these cancers (especially squamous cell cancers) can spread if not treated, and in some cases they can even be fatal.
These cancers are discussed in more detail in *Skin Cancer: Basal and Squamous Cell*.

**Melanomas**

Melanomas are cancers that develop from melanocytes, the cells that make the brown pigment that gives skin its color. Melanocytes can also form benign (non-cancerous) growths called *moles*.

(Your doctor might call the mole a *nevus*.)

Melanomas can occur anywhere on the body, but are more likely to start in certain areas. The trunk (chest and back) is the most common place in men. In women, the legs are the most common site. The neck and face are other common places for melanoma to start.

Melanomas are not as common as basal cell and squamous cell skin cancers, but they can be far more serious. Like basal cell and squamous cell cancers, melanoma is almost always curable in its early stages. But if left alone, melanoma is much more likely to spread to other parts of the body, where it can be very hard to treat.

Melanomas are discussed in more detail in *Melanoma Skin Cancer*.

**Other skin cancers**

There are many other types of skin cancers as well, but they are much less common:

- Merkel cell carcinoma
- Kaposi sarcoma
- Cutaneous (skin) lymphoma
- Skin adnexal tumors (tumors that start in hair follicles or sweat and oil glands)
- Various types of sarcomas

Together, these types account for less than 1% of all skin cancers.

It’s important for doctors to tell the types of skin cancer apart, because they are treated differently. It’s also important for you to know what skin cancers look like. This can help you find them at the earliest possible stage, when they are cured most easily.

**What is ultraviolet (UV) radiation?**

Exposure to ultraviolet (UV) radiation is a major risk factor for most skin cancers. Sunlight is the main source of UV rays. Tanning lamps and beds are also sources of UV rays. People who get a lot of UV exposure from these sources are at greater risk for skin cancer.

Even though UV rays make up only a very small portion of the sun’s rays, they are the main cause of the sun’s damaging effects on the skin. UV rays damage the DNA of skin cells. Skin cancers start when this damage affects the DNA of genes that control skin cell growth.

There are 3 main types of UV rays:
• **UVA rays** age skin cells and can damage their DNA. These rays are linked to long-term skin damage such as wrinkles, but they are also thought to play a role in some skin cancers. Most tanning beds give off large amounts of UVA, which has been found to increase skin cancer risk.

• **UVB rays** have slightly more energy than UVA rays. They can damage skin cells’ DNA directly, and are the main rays that cause sunburns. They are also thought to cause most skin cancers.

• **UVC rays** have more energy than the other types of UV rays, but they don’t get through our atmosphere and are not in sunlight. They are not normally a cause of skin cancer.

Both UVA and UVB rays can damage skin and cause skin cancer. UVB rays are a more potent cause of at least some skin cancers, but based on what’s known today, there are *no* safe UV rays.

The strength of the UV rays reaching the ground depends on a number of factors, such as:

• **Time of day:** UV rays are strongest between 10 am and 4 pm.

• **Season of the year:** UV rays are stronger during spring and summer months. This is less of a factor near the equator.

• **Distance from the equator (latitude):** UV exposure goes down as you get further from the equator.

• **Altitude:** More UV rays reach the ground at higher elevations.

• **Cloud cover:** The effect of clouds can vary. Sometimes cloud cover blocks some UV from the sun and lowers UV exposure, while some types of clouds can reflect UV and can increase UV exposure. What is important to know is that UV rays can get through, even on a cloudy day.

• **Reflection off surfaces:** UV rays can bounce off surfaces like water, sand, snow, pavement, or grass, leading to an increase in UV exposure.

The amount of UV exposure a person gets depends on the strength of the rays, the length of time the skin is exposed, and whether the skin is protected with clothing or sunscreen.

People who live in areas with year-round, bright sunlight have a higher risk of skin cancer. Spending a lot of time outdoors for work or recreation without protective clothing and sunscreen increases your risk.

The pattern of exposure may also be important. For example, frequent sunburns in childhood may increase the risk for some types of skin cancer many years or even decades later.

Skin cancers are one result of getting too much sun, but there are other effects as well. Sunburn and tanning are the short-term results of too much exposure to UV rays, and are signs of skin damage. Long-term exposure can cause early skin aging, wrinkles, loss of skin elasticity, dark patches (lentigos, sometimes called *age spots* or *liver spots*), and pre-cancerous skin changes (such as dry, scaly, rough patches called *actinic keratosis*).

The sun’s UV rays increase a person’s risk of cataracts and certain other eye problems, too. They can also suppress the skin’s immune system. Darker-skinned people are generally less likely to get skin cancer than light-skinned people, but they can still get cataracts and immune suppression.
The UV Index

As noted above, the amount of UV light reaching the ground in any given place depends on a number of factors, including the time of day, time of year, elevation, and cloud cover. To help people better understand the strength of UV light in their area on a given day, the National Weather Service and the Environmental Protection Agency (EPA) have developed the UV Index. It gives people an idea of how strong the UV light is in their area, on a scale from 1 to 11+. A higher number means greater risk of exposure to UV rays and a higher chance of sunburn and skin damage that could ultimately lead to skin cancer.

The UV Index is given daily for regions throughout the country. Many newspaper, television, online, and smartphone weather forecasts include the projected UV Index. Further information about the UV Index, as well as your local UV Index forecast, can be found on the EPA’s website at www.epa.gov/sunwise/uvindex.html. Smartphone apps are available from the EPA at www.epa.gov/enviro/mobile. As with any forecast, local changes in cloud cover and other factors could change the actual UV levels experienced.

Are some people more likely to get skin damage from the sun?

Everyone’s skin and eyes can be affected by the sun and other forms of ultraviolet (UV) rays. People with light skin are much more likely to have sun damage, but darker-skinned people, including people of any ethnicity, can also be affected.

For some people, the skin tans when it absorbs UV rays. The tan is caused by an increase in the activity and number of melanocytes, the cells that make the pigment melanin. Melanin helps block out damaging UV rays up to a point, which is why people with naturally darker skin are less likely to get sunburned, while people with lighter skin are more likely to burn. Sunburns can increase your risk of skin cancer, including melanoma. But UV exposure can raise skin cancer risk even without causing sunburn.

Aside from skin tone, other factors can also affect your risk of damage from UV light. You need to be especially careful in the sun if you:

- Had skin cancer before
- Have a family history of skin cancer, especially melanoma
- Have many moles, irregular moles, or large moles
- Have freckles and burn before tanning
- Have fair skin, blue or green eyes, or blond, red, or light brown hair
- Live or vacation at high altitudes (the strength of UV rays increases the higher up you are)
- Live or vacation in tropical or subtropical climates
- Work indoors all week and then get intense sun exposure on weekends
- Spend a lot of time outdoors
• Have certain autoimmune diseases, such as systemic lupus erythematosus (SLE, or “lupus”)

• Have certain inherited conditions that increase your risk of skin cancer, such as xeroderma pigmentosum (XP) or nevoid basal cell carcinoma syndrome (Gorlin syndrome).

• Have a medical condition that weakens your immune system, such as infection with HIV (the virus that causes AIDS)

• Have had an organ transplant

• Take medicines that lower or suppress your immune system

• Take medicines that make your skin more sensitive to sunlight

Ask your doctor, nurse, or pharmacist if you are taking any medicines that could increase your sensitivity to sunlight.

How do I protect myself from UV rays?

People who get a lot of exposure to ultraviolet (UV) rays are at greater risk for skin cancer.

Sunlight is the main source of UV rays, but you don’t have to avoid the sun completely. And it would be unwise to stay inside if it would keep you from being active, because physical activity is important for good health. But getting too much sun can be harmful. There are some steps you can take to limit your exposure to UV rays.

Some people think about sun protection only when they spend a day at the lake, beach, or pool. But sun exposure adds up day after day, and it happens every time you are in the sun.

Simply staying in the shade is one of the best ways to limit your UV exposure. If you are going to be in the sun, “Slip! Slop! Slap!® and Wrap” is a catchphrase that can help you remember some of the key steps you can take to protect yourself from UV rays:

• Slip on a shirt.

• Slop on sunscreen.

• Slap on a hat.

• Wrap on sunglasses to protect the eyes and skin around them.

Seek shade

An obvious but very important way to limit your exposure to UV light is to avoid being outdoors in direct sunlight too long. This is particularly important between the hours of 10 am and 4 pm, when UV light is strongest. If you are unsure how strong the sun’s rays are, use the shadow test: if your shadow is shorter than you are, the sun’s rays are the strongest, and it’s important to protect yourself.

UV rays reach the ground all year, even on cloudy or hazy days, but the strength of UV rays can change based on the time of year and other factors. UV rays become more intense in the spring, even before temperatures get warmer. People in some areas may get sunburned when the weather
is still cool because they may not think about protecting themselves if it’s not hot out. Be especially careful on the beach or in areas with snow because sand, water, and snow reflect sunlight, increasing the amount of UV radiation you get. UV rays can also reach below the water’s surface, so you can still get a burn even if you’re in the water and feeling cool.

Some UV rays can also pass through windows. Typical car, home, and office windows block most UVB rays but a smaller portion of UVA rays, so even if you don’t feel you’re getting burned your skin may still get some damage. Tinted windows help block more UVA rays, but this depends on the type of tinting. (If you do have your car windows tinted, check local laws, as some states regulate this.) UV radiation that comes through windows probably doesn’t pose a great risk to most people unless they spend long periods of time close to a window that gets direct sunlight.

If you plan to be outdoors, you may want to check the UV Index for your area. The UV Index usually can be found in local newspaper, TV, radio, and online forecasts. It’s also on the EPA’s website at www.epa.gov/sunwise/uvindex.html and in many smartphone apps (see www.epa.gov/enviro/mobile).

Protect your skin with clothing

When you are out in the sun, wear clothing to cover as much skin as possible. Clothes provide different levels of UV protection. Long-sleeved shirts, long pants, or long skirts cover the most skin and are the most protective. Dark colors generally provide more protection than light colors. A tightly woven fabric protects better than loosely woven clothing. Dry fabric is generally more protective than wet fabric.

Be aware that covering up doesn’t block out all UV rays. If you can see light through a fabric, UV rays can get through, too.

Some companies now make clothing that’s lightweight, comfortable, and protects against UV exposure even when wet. It tends to be more tightly woven, and some have special coatings to help absorb UV rays. These sun-protective clothes may have a label listing the UV protection factor (UPF) value (the level of protection the garment provides from the sun’s UV rays, on a scale from 15 to 50+). The higher the UPF, the higher the protection from UV rays.

Newer products, which are used like laundry detergents in a washing machine, can increase the UPF value of clothes you already own. They add a layer of UV protection to your clothes without changing the color or texture. This can be useful, but it’s not exactly clear how much it adds to protecting you from UV rays, so it’s still important to follow the other steps listed here.

Use sunscreen

Sunscreen is a product that you put on your skin to protect it from the sun’s UV rays. But it’s important to know that sunscreen is just a filter – it does not block all UV rays. Sunscreen should not be used as a way to prolong your time in the sun. Even with proper sunscreen use, some UV rays get through, which is why using other forms of sun protection is also important.

Sunscreens are available in many forms – lotions, creams, ointments, gels, sprays, wipes, and lip balms, to name a few.
Some cosmetics, such as moisturizers, lipsticks, and foundations, are considered sunscreen products if they have sunscreen. Some makeup contains sunscreen, but you have to check the label – makeup, including lipstick, without sunscreen does not provide sun protection.

Read the labels

When choosing a sunscreen product, be sure to read the label. Sunscreens with broad spectrum protection (against both UVA and UVB rays) and with sun protection factor (SPF) values of 30 or higher are recommended.

**Sun protection factor (SPF):** The SPF number is the level of protection the sunscreen provides against UVB rays, which are the main cause of sunburn. A higher SPF number means more UVB protection (although it says nothing about UVA protection). For example, when applying an SPF 30 sunscreen correctly, you get the equivalent of 1 minute of UVB rays for each 30 minutes you spend in the sun. So, 1 hour in the sun wearing SPF 30 sunscreen is the same as spending 2 minutes totally unprotected. People often do not apply enough sunscreen, so they get less actual protection.

Sunscreens labeled with SPFs as high as 100+ are available. Higher numbers do mean more protection, but many people don’t understand the SPF scale. SPF 15 sunscreens filter out about 93% of UVB rays, while SPF 30 sunscreens filter out about 97%, SPF 50 sunscreens about 98%, and SPF 100 about 99%. The higher you go, the smaller the difference becomes. No sunscreen protects you completely.

Sunscreens with an SPF lower than 15 must now include a warning on the label stating that the product has been shown only to help prevent sunburn, not skin cancer or early skin aging.

**Broad spectrum sunscreen:** Sunscreen products can only be labeled “broad spectrum” if they have been tested and shown to protect against both UVA and UVB rays. Some of the chemicals in sunscreens that help protect against UVA rays include avobenzone (Parsol 1789), ecamsule, zinc oxide, and titanium dioxide.

Only broad spectrum sunscreen products with an SPF of 15 or higher can state that they help protect against skin cancer and early skin aging if used as directed with other sun protection measures.

**Water resistant sunscreen:** Sunscreens are no longer allowed to be labeled as “waterproof” or “sweatproof” because these terms can be misleading. Sunscreens can claim to be “water resistant,” but they have to state whether they protect the skin for 40 or 80 minutes of swimming or sweating, based on testing.

**Expiration dates:** Check the expiration date on the sunscreen to be sure it’s still effective. Most sunscreen products are good for at least 2 to 3 years, but you may need to shake the bottle to remix the sunscreen ingredients. Sunscreens that have been exposed to heat for long periods, such as if they were kept in a glove box or car trunk through the summer, may be less effective.

**Be sure to apply the sunscreen properly**

Always follow the label directions. Most recommend applying sunscreen generously. When putting it on, pay close attention to your face, ears, neck, arms, and any other areas not covered by clothing. If you’re going to wear insect repellent or makeup, put the sunscreen on first.
Ideally, about 1 ounce of sunscreen (about a shot glass or palmful) should be used to cover the arms, legs, neck, and face of the average adult. Sunscreen needs to be reapplied at least every 2 hours to maintain protection. Sunscreens can wash off when you sweat or swim and then wipe off with a towel, so they might need to be reapplied more often. Be sure to read the label. And don’t forget your lips; lip balm with sunscreen is also available.

Some sunscreen products can irritate your skin. Many products claim to be hypoallergenic or dermatologist tested, but the only way to know for sure if a product will irritate your skin is to try it. One common recommendation is to apply a small amount to the soft skin on the inside of your elbow every day for 3 days. If your skin does not turn red or become itchy, the product is probably OK for you.

Sunless tanning products, such as bronzers and extenders (described in the section “What about tanning pills and other tanning products?”), give skin a tan or golden color. But unlike sunscreens, these products provide very little protection from UV damage.

**Wear a hat**

A hat with at least a 2- to 3-inch brim all around is ideal because it protects areas that are often exposed to intense sun, such as the ears, eyes, forehead, nose, and scalp. A dark, non-reflective underside to the brim can also help lower the amount of UV rays reaching the face from reflective surfaces such as water. A shade cap (which looks like a baseball cap with about 7 inches of fabric draping down the sides and back) also is good, and will provide more protection for the neck. These are often sold in sports and outdoor supply stores. If you don’t have a shade cap (or another good hat) available, you can make one by wearing a large handkerchief or bandana under a baseball cap.

A baseball cap protects the front and top of the head but not the neck or the ears, where skin cancers commonly develop. Straw hats are not as protective as hats made of tightly woven fabric.

**Wear sunglasses that block UV rays**

UV-blocking sunglasses are important for protecting the delicate skin around the eyes, as well as the eyes themselves. Research has shown that long hours in the sun without protecting your eyes increase your chances of developing certain eye diseases.

The ideal sunglasses should block 99% to 100% of UVA and UVB rays. Before you buy, check the label to make sure they do. Labels that say “UV absorption up to 400 nm” or “Meets ANSI UV Requirements” mean the glasses block at least 99% of UV rays. Those labeled “cosmetic” block about 70% of UV rays. If there is no label, don’t assume the sunglasses provide any UV protection.

Darker glasses are not necessarily better because UV protection comes from an invisible chemical in or applied to the lenses, not from the color or darkness of the lenses. Look for an ANSI label.

Large-framed and wraparound sunglasses are more likely to protect your eyes from light coming in from different angles. Children need smaller versions of real, protective adult sunglasses – not toy sunglasses.

Ideally, all types of eyewear, including prescription glasses and contact lenses, should protect against UV rays. Some contact lenses are now made to block most UV rays. But because they
don’t cover the whole eye and surrounding areas, they are not sufficient eye protection when used alone.

Avoid tanning beds and sun lamps

Many people believe the UV rays of tanning beds are harmless. This is not true. Tanning lamps give out UVA and usually UVB rays as well. Both UVA and UVB rays can cause long-term skin damage, and can contribute to skin cancer. Tanning bed use has been linked with an increased risk of melanoma, especially if it’s started before a person is 30. Most skin doctors and health organizations recommend not using tanning beds and sun lamps.

If you want a tan, one option is to use a sunless tanning lotion, which can provide a darker look without the danger. (See the section “What about tanning pills and other tanning products?”)

Small UV lamps are also used in nail salons (or at home) to dry some types of nail polish. These lamps give off UVA rays. The amount given off is much lower than from tanning beds, and the risk of skin cancer from these lamps is thought to be low. Still, to be safe, some expert groups recommend applying sunscreen to the hands before using one of these lamps.

Protect children from the sun

Children need special attention. They tend to spend more time outdoors, can burn more easily, and may not be aware of the dangers. Parents and other caregivers should protect children from excess sun exposure by using the steps above. It’s important, particularly in sunnier parts of the world, to cover your children as fully as is reasonable. You should develop the habit of using sunscreen on exposed skin for yourself and your children whenever you go outdoors and may be exposed to large amounts of sunlight. Children need to be taught about the dangers of too much sun exposure as they become more independent. If you or your child burns easily, be extra careful to cover up, limit exposure, and apply sunscreen.

Babies younger than 6 months should be kept out of direct sunlight and protected from the sun using hats and protective clothing. Sunscreen may be used on small areas of exposed skin only if adequate clothing and shade are not available.

A word about sun exposure and vitamin D

Doctors are learning that vitamin D has many health benefits. It might even help lower the risk for some cancers. Your skin makes vitamin D naturally when you are in the sun. How much vitamin D you make depends on many things, including how old you are, how dark your skin is, and how strong the sunlight is where you live.

At this time, doctors aren’t sure what the optimal level of vitamin D is. A lot of research is being done in this area. Whenever possible, it’s better to get vitamin D from your diet or vitamin supplements rather than from sun exposure because dietary sources and vitamin supplements do not increase skin cancer risk, and are typically more reliable ways to get the amount you need.
What about tanning pills and other tanning products?

Several products claim to give a tan without exposing a person to ultraviolet (UV) radiation. Some may be safe and effective, but others might not work, and some could even be harmful.

Tanning pills and accelerators

Tanning pills contain color additives similar to beta-carotene, the substance that gives carrots their orange color. Once swallowed, the additives are deposited throughout the body, especially the skin, turning it an orange-like color. Although the US Food and Drug Administration (FDA) has approved some of these additives for coloring food, they are not approved for use in tanning agents. They may be harmful at the high levels that are used in tanning pills. The main ingredient in most sunless tanning pills, canthaxanthin, can show up in your eyes as yellow crystals, which may cause injury and impair vision. There have also been reports of liver and skin problems.

Tanning accelerators, such as lotions or pills that contain the amino acid tyrosine or its derivatives, do not work and may be dangerous. Marketers say these products stimulate the body’s own tanning process, but most evidence suggests they don’t work. The FDA considers them unapproved new drugs that have not been shown to be safe and effective.

No tanning pills have been approved by the FDA.

Bronzers and extenders

Two other sunless tanning products, bronzers and extenders, are considered cosmetics for use on the skin. They are not thought to be harmful when used properly.

Bronzers, made from color additives approved by the FDA for cosmetic use, stain the skin for a short time when applied and can be washed off with soap and water.

Extenders (also known as sunless tanners or self-tanners) are applied to the skin as lotions or creams, where they interact with proteins on the surface of the skin to produce a darker color. Like a tan, the color tends to wear off after a few days. The only FDA-approved color additive for extenders is dihydroxyacetone (DHA).

Applying these products by hand can sometimes lead to uneven coloring, so some tanning salons have begun to offer whole body sprays in tanning booths. A concern here is that DHA is approved for external use only and should not be inhaled or sprayed in or on the mouth, eyes, or nose. People who choose to get a DHA spray tan should make sure to protect these areas.

These products can give skin a darker color (although in some people it may have a slight orange tinge), but they don’t offer much protection from the damaging effects of UV radiation. Even if they contain sunscreen, it would only be effective for a couple of hours. You should read the label carefully to determine whether or not a product provides any protection, but in most cases it’s safest to continue to use sunscreen and wear protective clothing when going outside.
Skin exams

Most skin cancers can be found early with skin exams. Regular exams by your doctor and checking your own skin frequently can help find cancers early, when they are easier to treat.

Regular skin exams are especially important for people who are at higher risk of skin cancer, such as people with reduced immunity, people who have had skin cancer before, and people with a strong family history of skin cancer. Talk to your doctor about how often you should have your skin examined.

Get your skin checked by your doctor

Your doctor should check your skin carefully as part of a routine cancer-related check-up. They should be willing to discuss any concerns you might have about this exam.

Check your own skin

It’s important to check your own skin, preferably once a month. A skin self-exam is best done in a well-lit room in front of a full-length mirror. You can use a hand-held mirror to look at areas that are hard to see, such as the backs of your thighs. A spouse or close friend or family member may be able to help you with these exams, especially for those hard-to-see areas like your back or scalp.

The first time you examine your skin, spend time carefully going over the entire surface. Learn the pattern of moles, blemishes, freckles, and other marks on your skin so that you’ll notice any changes next time. Be sure to show your doctor any areas that concern you.

Follow these step-by-step instructions to examine your skin:

Face the mirror

Check your face, ears, neck, chest, and belly. Women will need to lift their breasts to check the skin underneath.
Check your underarm areas, both sides of your arms, the tops and palms of your hands, in between your fingers, and your fingernails.

Sit down

Check the front of your thighs, shins, tops of your feet, in between your toes, and your toenails.

Now use a hand mirror to look at the bottoms of your feet, your calves, and the backs of your thighs, first checking one leg and then the other.
Use the hand mirror to check your buttocks, genital area, lower and upper back, and the back of the neck and ears. Or it may be easier to look at your back in the wall mirror using a hand mirror.

Use a comb or hair dryer to part your hair so that you can check your scalp.

The best time to do this simple monthly exam is after a bath or shower. Check any moles, blemishes, or birthmarks from the top of your head to your toes. If you look at your skin regularly, you will know what’s normal for you.

What should I look for on a skin self-exam?

Skin cancers can show up in many shapes and sizes. Be sure to show your doctor any areas that concern you, especially if they have just appeared or have changed recently.

Basal and squamous cell cancers

Basal cell cancers and squamous cell cancers are most often found in areas that get exposed to a lot of sun, such as the head, neck, and arms, but they can develop anywhere on the body. Look for new growths, spots, bumps, patches, or sores that don’t heal after several weeks. Shaving cuts that don’t heal in few days sometimes turn out to be skin cancers, which often bleed easily. (They are not caused by shaving.)

Basal cell carcinomas can appear in a number of different ways:

- Flat, firm, pale or yellow areas, similar to a scar
- Raised reddish patches that might be itchy
- Small, pink or red, translucent, shiny, pearly bumps, which might have blue, brown, or black areas
- Pink growths with raised edges and a lower area in their center, which might contain abnormal blood vessels
• Open sores (which may have oozing or crusted areas) that don’t heal, or that heal and then come back

**Squamous cell carcinomas** can appear as:

• Rough or scaly red patches, which might crust or bleed

• Raised growths or lumps, sometimes with a lower area in the center

• Open sores (which may have oozing or crusted areas) that don’t heal, or that heal and then come back

• Wart-like growths

Both of these types of skin cancer may develop as a flat area showing only slight changes from normal skin.

**Actinic keratosis**, also known as **solar keratosis**, is a skin condition that can sometimes progress to squamous cell cancer (although most of them do not).

Actinic keratoses are caused by too much sun exposure. They are usually small (less than ¼ inch across), rough or scaly spots that may be pink-red or flesh-colored. Usually they start on the face, ears, backs of the hands, and arms, but they can occur on other sun-exposed areas of skin. People with one actinic keratosis usually develop many more.

Some can grow into squamous cell cancers, while others may stay the same or even go away on their own. But it can be hard sometimes even for doctors to tell them apart from true skin cancers. These areas should be looked at by a doctor, who can help decide if they should be treated.

**Moles and melanomas**

**Normal moles**

A normal mole is usually an evenly colored brown, tan, or black spot on the skin. It can be either flat or raised. It can be round or oval. Moles are generally less than 6 millimeters (about ¼ inch) across (about the width of a pencil eraser). Some moles can be present at birth, but most appear during childhood or young adulthood. New moles that appear later in life should be checked by a doctor.

Once a mole has developed, it will usually stay the same size, shape, and color for many years. Some moles may fade away with age.

Most people have moles, and almost all moles are harmless. But it’s important to notice changes in a mole – such as in its size, shape, or color – because this may be a sign that melanoma is developing.

**Possible signs and symptoms of melanoma**

The most important warning sign for melanoma is a new spot on the skin or a spot that’s changing in size, shape, or color. Another important sign is a spot that looks different from all of the other spots on your skin. If you have any of these warning signs, have your skin checked by a doctor.
The **ABCDE rule** is another guide to the usual signs of melanoma. Be on the lookout and tell your doctor about spots that have any of the following features:

- **A is for Asymmetry:** One half of a mole or birthmark does not match the other.
- **B is for Border:** The edges are irregular, ragged, notched, or blurred.
- **C is for Color:** The color is not the same all over and may include shades of brown or black, or sometimes with patches of pink, red, white, or blue.
- **D is for Diameter:** The spot is larger than 6 millimeters across (about ¼ inch – the size of a pencil eraser), although melanomas can sometimes be smaller than this.
- **E is for Evolving:** The mole is changing in size, shape, or color.

Some melanomas do not fit the rules described above, so it’s important to tell your doctor about any changes or new spots on the skin, or growths that look different from the rest of your moles.

Other warning signs are:

- A sore that does not heal
- Spread of pigment from the border of a spot into surrounding skin
- Redness or a new swelling beyond the border
- Change in sensation – itchiness, tenderness, or pain
- Change in the surface of a mole – scaliness, oozing, bleeding, or the appearance of a bump or nodule

To see some examples of skin cancers and other skin conditions, visit our Skin Cancer Image Gallery.

### What if I find something suspicious on a skin exam?

Be sure to show your doctor any area that concerns you. If your doctor suspects you might have skin cancer, he or she will do exams and tests to find out. If you can’t see your doctor right away, you might want to take good close-up photos of the area so your doctor can see if the area is changing when you do get an appointment.

### Medical history and physical exam

Usually the doctor’s first step is to take your medical history. The doctor will ask when the mark first appeared, if it has changed in size or appearance, and if it’s causing any symptoms (such as pain, itching, or bleeding). You might also be asked about past exposures to causes of skin cancer (including sunburns and tanning practices) and if you or anyone in your family has had skin cancer.
During your physical exam, your doctor will note the size, shape, color, and texture of the area in question, and if it is bleeding, oozing, or crusting. The rest of your body may be checked for moles and other spots that could be related to skin cancer.

The doctor may also feel the lymph nodes (bean-sized collections of immune system cells) under the skin near the suspicious area. Some skin cancers spread to lymph nodes. When this happens, the affected lymph nodes may become larger and firmer than usual.

If you are being seen by your primary doctor and skin cancer is suspected, you may be referred to a dermatologist, a doctor who specializes in skin diseases, who will look at the area more closely.

Along with a standard physical exam, many dermatologists use dermoscopy (also known as epiluminescence microscopy [ELM], surface microscopy, or dermatoscopy) to see spots on the skin more clearly. The doctor uses a dermoscope, which is a special magnifying lens and light source held near the skin. Sometimes the doctor will use a thin layer of alcohol or oil with this instrument. The doctor may take a digital photo of the spot.

When used by an experienced dermatologist, this test can improve the accuracy of finding skin cancers early. It can often help tell whether a spot on the skin is likely to be benign (not cancer) without doing a biopsy.

**Skin biopsy**

If the doctor thinks that a suspicious area might be skin cancer, a sample of skin from that area will be removed and looked at under a microscope. This is called a skin biopsy. There are many ways to do a skin biopsy. The doctor will choose one based on the suspected type of skin cancer, where it is on the body, the size of the affected area, and other factors. For more detailed information on skin biopsies, see our documents *Melanoma Skin Cancer* or *Skin Cancer: Basal and Squamous Cell*.

If a spot is found to be cancer or a pre-cancer, your doctor may want to do more tests or treat it. If the spot is small and localized, a more extensive biopsy (to remove more tissue) or some type of surgery may be all that’s needed. For cancers that might be more widespread (especially melanomas), imaging tests might be done to see if the cancer has spread, and treatment such as immunotherapy, targeted therapy, chemotherapy, or radiation might be needed. Again, to learn more, see our skin cancer information.

**Additional resources**

**More information from your American Cancer Society**

Here is more information you might find helpful. You also can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our website, www.cancer.org.

Melanoma Skin Cancer (also in Spanish)

Skin Cancer: Basal and Squamous Cell (also in Spanish)

Ultraviolet (UV) Radiation

Why You Should Know About Melanoma (also in Spanish)
Skin Cancer Image Gallery

A Parent’s Guide to Skin Protection (also in Spanish)

Sun Basics: Skin Protection Made Simple (brochure for children aged 8 to 14)

**National organizations and websites***

Along with the American Cancer Society, other sources of information and support include:

**American Academy of Dermatology (AAD)**
Toll-free number: 1-888-462-3376 (1-888-462-DERM)
Website: www.aad.org
Spot Skin Cancer website: www.aad.org/spot-skin-cancer

For information on melanoma, a skin cancer risk assessment, a locator for free skin cancer screenings, and a dermatologist locator

**Environmental Protection Agency (EPA)**
Website: www.epa.gov/sunwise

Has free sun safety information and a UV Index app that you can check using your zip code

**Melanoma Research Foundation**
Toll-free number: 1-877-673-6460
Website: www.melanoma.org

For more on melanoma and chat rooms, patient stories, and bulletin boards – all to support and educate anyone affected by melanoma

**National Cancer Institute**
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
TTY: 1-800-332-8615
Website: www.cancer.gov

Offers accurate, up-to-date information about cancer to patients, their families, and the general public

**Skin Cancer Foundation**
Toll-free number: 1-800-754-6490 (1-800-SKIN-490)
Website: www.skincancer.org

Has pictures and descriptions of skin cancers, information and educational materials, and newsletters

*Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit www.cancer.org.
References


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What is Physical Activity?

Physical activity simply means movement of the body that uses energy. Walking, gardening, briskly pushing a baby stroller, climbing the stairs, playing soccer, or dancing the night away are all good examples of being active. For health benefits, physical activity should be moderate or vigorous intensity.

**Moderate physical activities include:**
- Walking briskly (about 3 ½ miles per hour)
- Bicycling (less than 10 miles per hour)
- General gardening (raking, trimming shrubs)
- Dancing
- Golf (walking and carrying clubs)
- Water aerobics
- Canoeing
- Tennis (doubles)

**Vigorous physical activities include:**
- Running/jogging (5 miles per hour)
- Walking very fast (4 ½ miles per hour)
- Bicycling (more than 10 miles per hour)
- Heavy yard work, such as chopping wood
- Swimming (freestyle laps)
- Aerobics
- Basketball (competitive)
- Tennis (singles)

You can choose moderate or vigorous intensity activities, or a mix of both each week. Activities can be considered vigorous, moderate, or light in intensity. This depends on the extent to which they make you breathe harder and your heart beat faster.

Only moderate and vigorous intensity activities count toward meeting your physical activity needs. With vigorous activities, you get similar health benefits in half the time it takes you with moderate ones. You can replace some or all of your moderate activity with vigorous activity. Although you are moving, light intensity activities do not increase your heart rate, so you should not count these towards meeting the physical activity recommendations. These activities include walking at a casual pace, such as while grocery shopping, and doing light household chores.
Why Is Physical Activity Important?

Regular physical activity can produce long term health benefits. People of all ages, shapes, sizes, and abilities can benefit from being physically active. The more physical activity you do, the greater the health benefits.

Being physically active can help you:

- Increase your chances of living longer
- Feel better about yourself
- Decrease your chances of becoming depressed
- Sleep well at night
- Move around more easily
- Have stronger muscles and bones
- Stay at or get to a healthy weight
- Be with friends or meet new people
- Enjoy yourself and have fun

When you are not physically active, you are more likely to:

- Get heart disease
- Get type 2 diabetes
- Have high blood pressure
- Have high blood cholesterol
- Have a stroke

Physical activity and nutrition work together for better health. Being active increases the amount of calories burned. As people age their metabolism slows, so maintaining energy balance requires moving more and eating less.

Some types of physical activity are especially beneficial:

- **Aerobic activities** make you breathe harder and make your heart beat faster. Aerobic activities can be moderate or vigorous in their intensity. Vigorous activities take more effort than moderate ones. For **moderate activities**, you can talk while you do them, but you can't sing. For **vigorous activities**, you can only say a few words without stopping to catch your breath.

http://www.choosemyplate.gov/physical-activity/why.html
Muscle-strengthening activities make your muscles stronger. These include activities like push-ups and lifting weights. It is important to work all the different parts of the body - your legs, hips, back, chest, stomach, shoulders, and arms.

Bone-strengthening activities make your bones stronger. Bone strengthening activities, like jumping, are especially important for children and adolescents. These activities produce a force on the bones that promotes bone growth and strength.

Balance and stretching activities enhance physical stability and flexibility, which reduces risk of injuries. Examples are gentle stretching, dancing, yoga, martial arts, and t'ai chi.
How Much Physical Activity is Needed?

Physical activity is important for everyone, but how much you need depends on your age.

**ADULTS**
**(18 to 64 years)**

Adults should do at least 2 hours and 30 minutes each week of aerobic physical activity at a moderate level OR 1 hour and 15 minutes each week of aerobic physical activity at a vigorous level. Being active 5 or more hours each week can provide even more health benefits. Spreading aerobic activity out over at least 3 days a week is best. Also, each activity should be done for at least 10 minutes at a time. Adults should also do strengthening activities, like push-ups, sit-ups and lifting weights, at least 2 days a week.

**CHILDREN AND ADOLESCENTS**
**(6-17 years)**

Children and adolescents should do 60 minutes or more of physical activity each day. Most of the 60 minutes should be either moderate- or vigorous intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week. As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening activities, like climbing, at least 3 days a week and bone-strengthening activities, like jumping, at least 3 days a week. Children and adolescents are often active in short bursts of time rather than for sustained periods of time, and these short bursts can add up to meet physical activity needs. Physical activities for children and adolescents should be developmentally-appropriate, fun, and offer variety.

**YOUNG CHILDREN**
**(2-5 years)**

There is not a specific recommendation for the number of minutes young children should be active each day. Children ages 2-5 years should play actively several times each day. Their activity may happen in short bursts of time and not be all at
once. Physical activities for young children should be developmentally-appropriate, fun, and offer variety.

Physical activity is generally safe for everyone. The health benefits you gain from being active are far greater than the chances of getting hurt. Here are some things you can do to stay safe while you are active:

- If you haven’t been active in a while, start slowly and build up.
- Learn about the types and amounts of activity that are right for you.
- Choose activities that are appropriate for your fitness level.
- Build up the time you spend before switching to activities that take more effort.
- Use the right safety gear and sports equipment.
- Choose a safe place to do your activity.
- See a health care provider if you have a health problem.
Tips for Increasing Physical Activity

Make physical activity a regular part of the day

Choose activities that you enjoy and can do regularly. Fitting activity into a daily routine can be easy — such as taking a brisk 10 minute walk to and from the parking lot, bus stop, or subway station. Or, join an exercise class. Keep it interesting by trying something different on alternate days. Every little bit adds up and doing something is better than doing nothing.

Make sure to do at least 10 minutes of activity at a time, shorter bursts of activity will not have the same health benefits. For example, walking the dog for 10 minutes before and after work or adding a 10 minute walk at lunchtime can add to your weekly goal. Mix it up. Swim, take a yoga class, garden or lift weights. To be ready anytime, keep some comfortable clothes and a pair of walking or running shoes in the car and at the office.

More ways to increase physical activity

At home:

- Join a walking group in the neighborhood or at the local shopping mall. Recruit a partner for support and encouragement.
- Push the baby in a stroller.
- Get the whole family involved — enjoy an afternoon bike ride with your kids.
- Walk up and down the soccer or softball field sidelines while watching the kids play.
- Walk the dog — don't just watch the dog walk.
- Clean the house or wash the car.
- Walk, skate, or cycle more, and drive less.
- Do stretches, exercises, or pedal a stationary bike while watching television.
- Mow the lawn with a push mower.
- Plant and care for a vegetable or flower garden.
- Play with the kids — tumble in the leaves, build a snowman, splash in a puddle, or dance to favorite music.
- Exercise to a workout video.
At work:

- Get off the bus or subway one stop early and walk or skate the rest of the way.
- Replace a coffee break with a brisk 10-minute walk. Ask a friend to go with you.
- Take part in an exercise program at work or a nearby gym.
- Join the office softball team or walking group.

At play:

- Walk, jog, skate, or cycle.
- Swim or do water aerobics.
- Take a class in martial arts, dance, or yoga.
- Golf (pull cart or carry clubs).
- Canoe, row, or kayak.
- Play racquetball, tennis, or squash.
- Ski cross-country or downhill.
- Play basketball, softball, or soccer.
- Hand cycle or play wheelchair sports.
- Take a nature walk.
- Most important — have fun while being active!

http://www.choosemyplate.gov/physical-activity/increase-physical-activity.html