Circulation
Discovery Cart
Instructional Guide

Revised by Consultant 5/3/2013
Quick Start Guide to Presenting a Discovery Cart

Working a Discovery Cart allows our guests to receive information in a fun and interactive setting while learning from a future health care professional!

Please welcome our guests by engaging them using a question. Below you will find a suggested format for engaging visitors at your cart for about 3-5 minutes.

Feel free to tell them more about your experience in school, studying science, and working hard to become a doctor, nurse, or physician's assistant.

**Recommendations: The 5 E's**

**Engage** - Engage your audience by asking a question.

**Extract** - Find out what your audience already knows! Quiz them with questions to make your cart more interactive.

**Experiment** - Use the models and/or experiments to teach your audience something new.

**Explain** - Meet your audience at their level of knowledge. Explain science in a way that is interesting and exciting to them. (For example: You would explain the circulatory system very different to a 7 year-old child than to your professor.)

**Ending Idea** - Make sure your audience walks away with at least one take home point that will encourage them to make more healthy life choices.

Refer to the next page for an Overview of the Circulation Discovery Cart
Engage
Circulatory Questions to Ask

- What is the heart's function?
- What gas is carried by your blood to your body? away from your body?
- Do you know how big your heart is?

Visitor responses will guide what areas of the cart you wish to highlight.

Extract
Quiz to Promote Interaction

1. Do you know the most common cause of death in America? A: Heart disease
   (Refer to Section 14)

2. How many chambers or “rooms” does the heart contain?
   A: Four chambers: two atria + two ventricles
   (Refer to Section 1)

3. What is happening when you listen to your heart? A: lub-DUB, lub-DUB, lub-DUB. Sound familiar? If you listen to your heart beat, you’ll hear two sounds. These “lub” and “DUB” sounds are made by the heart valves as they open and close. (Refer to Section 9)

4. What is the difference between arteries and veins? A: Arteries carry blood AWAY from the heart and contain oxygenated blood. Arteries also contain more layers of smooth muscle than veins. Veins carry blood INTO the heart and contain deoxygenated blood. (Refer to Section 3)

Experiment & Explain
Teaching Tools

1. The Human Heart
   Explain the location, structure, and function of the human heart and how blood flows to/from the heart. Demonstrate with the jumbo heart model.

2. Sheep & Human Heart Specimens
   Explain the structure and function of the heart. Demonstrate with organ specimens.

3. Arteries & Veins
   Explain arteriosclerosis, atherosclerosis, and the function of arteries and veins. Demonstrate with specimens.

4. Fat vs. Muscle
   Explain why more muscle is better than too much fat. Demonstrate with “fat belt” to mimic 5 extra pounds of weight.

5. Plaque Build-Up
   Explain how plaque builds up in arteries. Demonstrate with “Death of an Artery” poster.

6. Occluded Arteries
   Explain how plaque slows down blood flow. Demonstrate with Occluded Artery model.

7. Tainted Blood
   Explain how smoking causes damage in the bloodstream. Demonstrate with “Tainted Blood” poster.

8. The Skinny on Fat
   Explain the different types of dietary fats. Demonstrate amount of fat found in typical foods using the fat vials and food models.

9. Heart Sounds
   Explain location of the heart and the different sounds it makes. Demonstrate with stethoscope, allowing visitors to listen to their own heartbeat.

10. Find Your Pulse
    Explain how to locate a pulse point. Demonstrate by guiding visitors in locating their own pulse.

11. Blood Pressure
    Explain blood pressure. Demonstrate with the Digital Blood Pressure Monitor.

12. Heart Rate
    Explain resting and target heart rates. Demonstrate with the Heart Rate Monitor.

13. Fitness Dice
    Get visitors moving with a Fitness Dice demonstration to help increase their heart rate.

14. Bonus Material: Tips for Heart Health

Ending Ideas
Take Home Points

Use the Self-Prescription Questions and Facts about the Heart on the next page.
The average human body contains 5 liters of blood. 
Demonstrate with the 5 liters of red water in the two-liter bottles.

The average 2 year-old has two liters of blood in his/her body.

The heart is about the size of your clenched fist.

The heart is a muscle.

The heart pumps 40,000 gallons of blood each day.

The “heartbeat” is really the sound of the valves in the heart closing as they push blood through the chambers.

Strung together end-to-end, your blood vessels could circle the globe 2 1/2 times.

Your heart beats about 30 million times a year.

The aorta, the largest artery in the body, is almost the diameter of a garden hose. Capillaries, on the other hand, are so small that it takes ten of them to equal the thickness of a human hair.

There are multiple types of blood cells. 
Red blood cells carry oxygen.
White blood cells are part of the immune system and help fight infections by killing germs and bacteria. 
Platelets help the body repair itself after injury by forming a thrombus or blood clot.

For more information on heart health, visit the American Heart Association’s Web site at: www.heart.org
Experiment & Explain
Section 1: The Human Heart

Overview
- Explain the location, structure, and function of the human heart.
- Explain how blood flows to/from the heart.
- Demonstrate with the jumbo heart model.

Heart Model

The Location, Structure, and Function of the Human Heart

Put your hand on your heart. Did you place your hand on the left side of your chest? Many people do, but the heart is actually located almost in the center of the chest, between the lungs. It’s tipped slightly so that a part of it sticks out and taps against the left side of the chest, which is what makes it seem as though it is located there.

- Your heart is approximately the size of your fist; it may be the size of your fist with your other hand wrapped around it (heart grows as our body grows)
- 4 chambers (rooms) - allow blood to enter the heart at the same time it is being pumped out.
  - Upper chambers = atria
  - Lower chambers = ventricles
• Right side of heart is deoxygenated blood coming to the heart from the body, which then travels to the lungs.
• Left side of heart is oxygenated blood coming back from the lungs to be distributed to the body via the aorta.
• Tricuspid valve is on the right side of heart; bicuspid (or mitral) valve is on the left.
• Think of the valves as one-way exit. The blood cannot seep back into the atrium unless you have “leaky valves”, which can be determined by a doctor listening to your heartbeat with a stethoscope.
• Analogy to use is that the 4 chambers of the heart are rooms, and the blood must move through the “doors” (valves) to get to the next room on the same side of the heart.
• The septum is a muscle wall within the heart that separates the heart into the right and left halves. A fetus has a hole in this portion of the heart to allow the blood to circulate through the heart and body without exiting to leave the lungs since they are breathing amniotic fluid until birth. This hole typically closes itself shortly after birth.
• The heart is composed of cardiac muscle, not skeletal or smooth (refer to diagram below).

The heart’s primary function is to pump blood to all parts of the body, bringing nutrients and oxygen to the tissues and removing waste products.
How Blood Flows in the Heart

Inside the Heart

Superior vena cava

Pulmonary artery

Left atrium

Right atrium

Right ventricle

Left ventricle

Image: 3DScience.com
Text: LiveScience
Experiment & Explain
Section 2: Sheep & Human Heart Specimens

Overview
- Explain the structure and function of the heart.
  {Refer to Section 1 of this guide and “Take it to Heart” dissection guide}
- Demonstrate with organ specimens.
  {Refer to “Heart to Heart” and “Take it to Heart” dissection guides}

Description
Using the “Take it to Heart” dissection guide, you can perform a demonstration featuring a sheep’s heart specimen to help visitors identify the different parts of the heart and the role each one plays in keeping blood flowing throughout the body. The three different muscle types are compared to one another as well.

Using both the “Heart to Heart” and “Take it to Heart” dissection guides, you can introduce visitors to basic anatomy of the heart using sheep heart and human heart specimens. The flow of blood through the heart’s chambers, valves, and blood vessels is demonstrated using the sheep’s heart and the human heart.

IMPORTANT NOTES TO VOLUNTEER

Please refer to the “Heart to Heart” and “Take it to Heart” dissection guides provided on the cart for more information about the REAL animal organ specimens.

Gloves are provided for YOUR use only; visitors are NOT allowed to handle or touch the specimens. Please return the organs to their proper containers so that they remain “fresh” and don’t dry out!
Overview

• Explain arteriosclerosis, atherosclerosis, and the function of arteries and veins.
• Demonstrate with specimens.

Normal and Advanced Arteriosclerosis & Atherosclerosis

The normal artery in this specimen shows what a healthy, normal human artery looks like (both views of each artery are interior views of the vessel). Notice the large diameter for good blood flow through the vessel, as well as the smooth texture inside the artery.

In the artery with advanced arteriosclerosis there is calcium build up on the inside the vessel. This build up of calcium decreases the amount of blood permitted to flow through the vessel and effectively distribute the proper volume of oxygenated blood. (Note: Calcium does not necessarily build up in all types of arteriosclerosis.)

Arteriosclerosis encompasses all types of thickening and loss of elasticity of artery walls. Atherosclerosis is one type of arteriosclerosis. It is a gradual process that starts with injury to the thin layer of cells lining blood vessels. Things like high blood pressure or high LDL ("bad cholesterol) can cause this. When the injury happens, there is inflammation and fat is deposited, which builds up over time.

The aorta is the largest artery in the body. This vessel is responsible for distributing the oxygenated blood to the rest of the body via other arteries and capillaries.

Veins carry oxygen-poor blood to the heart (located closer to the skin surface). Arteries carry oxygenated blood from the heart (located deeper in the body tissues so they are more protected).
Experiment & Explain
Section 4: Fat vs. Muscle

This information is also included in the Nutrition Discovery Guide, Section 2

Overview
- Explain why more muscle is better than too much fat.
- Demonstrate with "fat belt" to mimic 5 extra pounds of weight.

- Muscle is more favorable than fat because it’s more dense and therefore takes up less space
  (Image at right shows one pound of muscle vs. one pound of fat)
- Building lean muscle mass helps burn fat.
- Having less body fat can lead to less fatigue, less strain to heart
  - your heart doesn’t have to work as hard!
- Fat cannot become muscle and muscle can not become fat.
- Body fat can only be reduced by making dietary changes—especially eating less saturated fat—and by burning more calories through physical activity.
- You cannot choose where you lose fat or gain fat. Fat cells decide where they go! It’s better to focus on building lean body mass, i.e. muscle.
- Weight training is the easiest way to control and monitor the changes in your muscle.
- Unlike fat, each muscle can be specifically targeted, so you can choose the specific area you would like to improve. With that said, realize that while you can work your abdominal muscles, for example, you may not see the enhanced shape and form if you have a thick layer of fat covering them up.
Experiment & Explain
Section 5: Plaque Build-up

Overview
• Explain how plaque builds up in arteries.
• Demonstrate with poster.

{Refer to poster for content/bullet points}

Death of an Artery Poster

• Displays the slow progression of plaque buildup in the arteries over time
• Process can be slowed/prevented with a healthy diet and regular physical activity.
• Give a more realistic example of this model by showing the artery specimens in Section 3 or demonstrate with the model in Section 6.
Experiment & Explain
Section 6: Occluded Arteries

Overview:
• Explain how plaque slows down blood flow.
• Demonstrate with Occluded Artery model.

Occluded Artery Model

This 10-times-larger-than-life, see-through artery model shows a constructed passage clogged with plaque.

When the model is turned over, lifelike red blood cells pack tightly around the small opening, just as they would in an artery restricted by atherosclerosis.
Experiment & Explain
Section 7: Tainted Blood

This information is also included in the Respiratory Discovery Cart Guide, Section 4

Overview:
• Explain how smoking causes damage in the bloodstream.
• Demonstrate with Tainted Blood poster.

Tainted Blood Poster

This unique model looks like a cigarette on the outside but the inside is a representation of an artery where carbon monoxide is keeping oxygen from flowing to the body’s organs and muscles. The display also shows plaque buildup caused by smoking and poisons from cigarette smoke traveling through the bloodstream.

Refer to the tent card that explains the model in detail and provides additional information about smoking hazards.
Experiment & Explain
Section 8: The Skinny on Fat
This information is also included in the Nutrition Discovery Cart Guide, Section 3

Overview:
• Explain the different types of dietary fats.
• Demonstrate amount of fat found in typical foods using the fat vials and food models. Note that each vial is labeled with its content.

The Skinny on Fat
• Fat sometimes gets a bad wrap but is actually essential to give our bodies energy and promote growth of cells.
• Fats help your body absorb certain vitamins and make hormones your body needs to regulate different bodily functions.
• Our bodies need fat - but not as much as some people may be eating.

What are the different types of dietary fats?
• The major types of fats we eat are:
  o Saturated and Trans fats aka "bad fats"
  o Monounsaturated and Polyunsaturated fats aka "better fats"
  o Saturated fats are carbon atoms saturated with hydrogen atoms and are solid at room temperature.
  o Foods high in saturated fat (fatty meat, bacon, sausage, poultry skin, lard, cream, butter) can increase your risk for heart disease because they can increase your LDL = "bad cholesterol" which clogs your arteries and causes plaque formation.
  o Trans fats are also solid at room temperature. They're created during a chemical process when hydrogen atoms are added to liquid vegetable oils.
  o Foods high in trans fat (stick margarine, shortening, fried foods, hydrogenated oils) can increase your LDL = "bad cholesterol" and may also lower your HDL = "good cholesterol."
  o Monounsaturated fats have one double-bonded/unsaturated carbon atom. These fats are liquid at room temperature and when refrigerated.
  o Foods rich in monounsaturated fat include: vegetable oils, avocados, olives, nuts, and seeds.
- **Polyunsaturated fats** have more than one double-bonded/unsaturated carbon atom. These fats are also liquid at room temperature and when refrigerated.
- Foods rich in polyunsaturated fat include: vegetable oils, nuts, seeds, and fatty fish like salmon and tuna.
- Both poly- and monounsaturated fats can help lower risk for heart disease by helping to lower “bad” cholesterol levels in the body.

### A Day’s Worth of Fat

- Creates awareness about the dangers of a high-fat diet.

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The heart-shaped bottle (pictured at left) contains simulated blood and ~98g of "fat."

The bottle illustrates the estimated amount of fat a person consumes with a 2,200-calorie diet if eating 40% of calories from fat.

Everyone’s nutritional needs are different but in general, a healthy diet for adults consists of 20% to 35% of calories from dietary fat with an emphasis on “good” fats (monounsaturated and polyunsaturated) and less than 10% of total calories from “bad” (saturated) fat.

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Sources: Academy of Nutrition and Dietetics; American Heart Association
Experiment & Explain
Section 9: Heart Sounds

Overview:

• Explain location of the heart and the different sounds heard with demonstration.
• Demonstrate with stethoscope, allowing visitors to listen to their own heartbeat. NOTE: Stethoscopes must be cleaned after each use with the alcohol wipes provided.

Location and Sounds of the Heart

The heart is located on the left side of the chest, with the bottom of the heart tilted a little more to the left. Encourage visitors to listen in this area, not on the right side of their chest or anywhere else.

The general placement of the heart can be determined by placing 2 fingers to the left of your sternum (bone running down the center of your chest) and placing your fist to the left of those 2 fingers—this is roughly where your heart is located.

The sound that you hear through the stethoscope is actually the sound of the valves closing in the heart as the blood is pumped through them.

There are 4 valves in the heart. 2 valves close at almost the same time, and the other 2 close at almost the exact same time.

Please ensure that each visitor cleans their stethoscope (the circular diaphragm that they place on their chest as well as the earpieces) before hanging the stethoscopes back on the cart.
Experiment & Explain
Section 10: Find Your Pulse

Overview:
- Explain how to locate a pulse point.
- Demonstrate by guiding visitors in locating their own pulse.

What is the pulse?
A normal heart receives oxygenated blood, denoted in red (right), entering via the left and right pulmonary veins. Upon contraction, blood is forced out of the left ventricle through the aortic valve and out to the rest of the body. Blood that does not contain oxygen is forced out of the right ventricle through the pulmonic valve and into the lungs.

How to Find Your Pulse
Feel your pulse by placing two fingers at pulse points on your neck or wrists. The pulse you feel is blood stopping and starting as it moves through your arteries. A pulse is felt because of the flaring of the aorta as the ventricle of the heart contracts.

Obtaining a pulse rate is important in determining how hard the heart is working and if a blood flow to a specific limb or body region is normal. As a kid, your resting pulse might range from 90 to 120 beats per minute. As an adult, your pulse rate slows to an average of 72 beats per minute.
Experiment & Explain
Section 11: Blood Pressure

Overview:
• Explain blood pressure and the ranges between normal and hypertension/high blood pressure.
• Demonstrate with the Digital Blood Pressure Monitor.

What is blood pressure?

Blood pressure is the pressure of the blood against the walls of the arteries. Blood pressure results from two forces: one is created by the heart as it pumps blood into the arteries and through the circulatory system; the other is the force of the arteries as they resist the blood flow.

What do blood pressure numbers indicate?

• The higher number (systolic) represents the pressure while the heart contracts to pump blood to the body.
• The lower number (diastolic) represents the pressure when the heart relaxes between beats.

The systolic pressure is always stated first. For example: 118/76 (118 over 76); systolic = 118, diastolic = 76.

<table>
<thead>
<tr>
<th>Status</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Less than 120</td>
<td>Less than 80</td>
</tr>
<tr>
<td>Pre-hypertension</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Watch carefully</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Blood Pressure Stage 1</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>See your doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Blood Pressure Stage 2</td>
<td>160 and above</td>
<td>100 and above</td>
</tr>
<tr>
<td>See your doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension Crisis</td>
<td>180 and above</td>
<td>110 and above</td>
</tr>
<tr>
<td>Seek emergency care immediately</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: American Heart Association
How can I tell if I have high blood pressure?

**High blood pressure usually has no symptoms.** In fact, many people have high blood pressure for years without knowing it. That's why it's called the "silent killer." **Hypertension** is the medical term for high blood pressure. It doesn't refer to being tense, nervous or hyperactive. You can be a calm, relaxed person and still have high blood pressure.

A single elevated blood pressure reading doesn’t mean you have high blood pressure, but it’s a sign that further observation is required. Ask your doctor how often to check it or have it checked. Certain diseases, such as kidney disease, can cause high blood pressure. In 90 to 95 percent of cases, the cause of high blood pressure is unknown.

The only way to find out if you have high blood pressure is to have your blood pressure checked. Your doctor or other qualified health professional should check your blood pressure at least once every two years, or more often if necessary.

**Optimal blood pressure with respect to cardiovascular risk is less than 120/80.** However, unusually low readings should be evaluated to rule out medical causes.
The Medical Consequences of Hypertension – The Silent Killer

Heart
Increased pressure over time stretches out the heart muscle, making it more difficult to contract and can lead to heart failure. Atherosclerosis is caused by high blood pressure and leads to heart attacks.

Brain
Stroke! Uncontrolled high blood pressure used to cause most strokes, killing many people instantly through blood vessels bursting. Strokes caused by a burst vessel are difficult to treat and are likely to reoccur.

Kidneys
Elevated blood pressure (hypertension) damages the kidneys over time. Hypertension is the second most common cause of kidney failure, which can only be treated by dialysis or a transplant.

Eyes
The vessels of the eye cannot withstand high pressures, which leads to fluid leaking out, blurred vision, hemorrhage, and blindness.
EFFECT OF SALT INTAKE ON BLOOD PRESSURE

Note to volunteer: Information below also included in Nutrition Discovery Cart.

• Sodium is an important mineral that our body needs, but only in small amounts. Too much sodium (salt) in the diet causes fluid build up that can lead to high blood pressure, stroke, heart failure, kidney disease, blindness and other health problems.

• High blood pressure is dangerous because it makes your heart work too hard, hardens the walls of your arteries, and can cause the brain to hemorrhage.

• Most people consume twice as much sodium as potassium. For good health, what is desired is a ratio closer to five times more potassium than sodium. This can be accomplished by eating a variety of vegetables and fruits – these are rich sources of potassium.

• The minerals potassium and magnesium both play a role in blood pressure regulation: potassium is an electrolyte that helps regulate blood pressure and fluid balance by aiding in heart and kidney function while magnesium dilates arteries for better blood flow.

• For more information about dietary guidelines and ways to cut sodium, visit the Museum’s Nutrition Discovery Cart.

Sources: American Heart Association; Academy of Nutrition and Dietetics; Escott-Stum 2012
Experiment & Explain
Section 12: Heart Rate

Overview:
- Explain resting heart rate and target heart rate.
- Demonstrate with the Heart Rate Monitor.

Heart Rate Monitor

This innovative heart rate monitor uses patented technology to measure heart rate precisely with the simple touch of the hands.

Simply grasp the Insta-Pulse with both hands; it turns on automatically and instantly displays your heart rate on a four beat average with ± one beat accuracy. Release one hand and it’s off!

What is resting heart rate?

Resting heart rate is a person’s heart rate at rest. The best time to find out your resting heart rate is in the morning, after a good night’s sleep, and before you get out of bed.

The heart beats about 60 to 80 times a minute when we’re at rest. Resting heart rate usually rises with age, and it’s generally lower in physically fit people—as you become more fit, your heart rate decreases. Resting heart rate is used to determine one’s training target heart rate. Athletes sometimes measure their resting heart rate as one way to find out if they’re “over trained” or fatigued.

The heart rate adapts to changes in the body’s need for oxygen, such as during exercise or sleep. Your hydration status also affects your heart rate. Heart rate rises and you become dehydrated which is especially important for athletic performance.
Target Heart Rates and Physical Activity

Health professionals know the importance of proper pacing during physical activity. To receive the benefits of physical activity, it's important not to tire too quickly. Pacing yourself is especially important if you've been inactive.

Target heart rates let you measure your initial fitness level and monitor your progress in a fitness program. This approach requires measuring your pulse periodically as you exercise and staying within 50 to 85 percent of your maximum heart rate. This range is called your target heart rate. Many fitness classes or certain types of fitness equipment have target ranges for heart health and fat burning.

What is an alternative to target heart rates?
Some people can't measure their pulse or don't want to take their pulse when exercising. If this is true for you, try using a "conversational pace" to monitor your activity level during moderate activities like light walking. If you can walk and talk or sing comfortably at the same time, you may not be working hard enough for health benefits. If you find yourself out of breath quickly, you may be working too hard — especially if you have to stop to catch your breath.

When should I use the target heart rate?
If you participate in more vigorous activities like brisk walking and jogging, the "conversational pace" approach may not work. Instead, try using the target heart rate. It works for many people, and it's a good way for health professionals to monitor your progress.

The table on the following page shows estimated target heart rates for different ages. Look for the closest age category then read across to find the target heart rate.
<table>
<thead>
<tr>
<th>Age</th>
<th>Target HR Zone 50-85%</th>
<th>Average Maximum Heart Rate 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>100-170 beats per minute</td>
<td>200 beats per minute</td>
</tr>
<tr>
<td>30 years</td>
<td>95-162 beats per minute</td>
<td>190 beats per minute</td>
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<tr>
<td>35 years</td>
<td>93-157 beats per minute</td>
<td>185 beats per minute</td>
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<tr>
<td>40 years</td>
<td>90-153 beats per minute</td>
<td>180 beats per minute</td>
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<tr>
<td>45 years</td>
<td>88-149 beats per minute</td>
<td>175 beats per minute</td>
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<td>50 years</td>
<td>85-145 beats per minute</td>
<td>170 beats per minute</td>
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<tr>
<td>55 years</td>
<td>83-140 beats per minute</td>
<td>165 beats per minute</td>
</tr>
<tr>
<td>60 years</td>
<td>80-136 beats per minute</td>
<td>160 beats per minute</td>
</tr>
<tr>
<td>65 years</td>
<td>78-132 beats per minute</td>
<td>155 beats per minute</td>
</tr>
<tr>
<td>70 years</td>
<td>75-128 beats per minute</td>
<td>150 beats per minute</td>
</tr>
</tbody>
</table>

Your maximum heart rate is about 220 minus your age.
The figures above are averages, so use them as general guidelines.

Note: A few high blood pressure medications lower the maximum heart rate and thus the target zone rate. If you’re taking such medicine, call your physician to find out if you need to use a lower target heart rate.

How should I pace myself?

When starting a physical activity program, aim at the lowest part of your target zone (50 percent) during the first few weeks. Gradually build up to the higher part of your target zone (75 percent). After six months or more of regular activity, you may be able to stay active comfortably at up to 85 percent of your maximum heart rate. However, you don’t have to exercise that hard to stay in shape.
Experiment & Explain
Section 13: Fitness Dice

Overview:
• Get visitors moving by asking them to participate in simple exercises that will help increase their heart rate.
• Demonstrate with the Fitness Dice.

Fitness Dice

1. Measure the visitor’s heart rate.

2. Roll the Fitness Dice to determine the number of repetitions and type of activity. Example at left: 2 Jumping Jacks

3. Measure the visitor’s heart rate after the activity is completed and compare results.
Heart (cardiovascular) disease is the Number 1 killer in the United States. If you want your heart to be healthy, follow these guidelines established by the American Heart Association’s “Life’s Simple 7”:

1. Don’t smoke.
2. Maintain a healthy weight.
3. Engage in regular physical activity.
4. Eat a healthy diet.
5. Manage blood pressure.
6. Take charge of cholesterol.
7. Keep blood sugar (glucose) at healthy levels.

Adults need AT LEAST 30 minutes of moderate to vigorous level activity most days of the week; children need AT LEAST 60 minutes of activity EVERY DAY.

Ways to Work More Physical Activity into Your Day
If you’re not convinced about the need to develop an activity program for your life, you can at least try following some of these tips in your everyday routine. Take advantage of any opportunity to be more active. Try these tips:

• Take the stairs instead of an elevator or escalator at school, work, or the mall. Just start with one flight. Soon, you’ll be ready for two or more.
• When you feel safe doing so, park your car at the far end of the parking lot. The walk to and from the store or school helps your heart.
• If you ride a bus or subway, get off a stop before your destination and walk the rest of the way.
• If you can, spend a few minutes of your lunch break taking a brisk walk around the campus grounds. This can help you stay more alert after the rest of the day.
• Think of housework as an extra chance to add activity minutes to your day. Vacuuming briskly or mowing the lawn can be a real workout.
• If you have a dog, think of the dog as an exercise machine with fur! A brisk walk with the dog is good for both of your hearts. Make it a part of your daily routine.
Heart-Healthy Eating
The American Heart Association recommends eating a wide variety of nutritious foods. As part of a healthy diet, adults should aim for:

• 4 to 5 cups of fruits and vegetables daily
• 6 ounces of fish (oily fish such as salmon) weekly
• 3 ounces of fiber-rich whole grains
• Less than 1,500mg of sodium daily = less than \( \frac{1}{2} \) teaspoon!
• No more than 450 calories (36 ounces) of sugar-sweetened beverages (sodas, juices, etc.) weekly
• 4 servings of nuts, legumes and seeds weekly
• No more than 2 servings of processed meats weekly
• Less than 7% of total energy intake from saturated fat daily

Be a Heart Saver—Recognize Heart Attack Warning Signs
If you’re with someone who seems to be having an attack, act immediately by calling 911. Don’t wait more than five minutes before calling for help. If you’re the one having symptoms, get to a hospital right away but don’t drive yourself unless there is no other option.

Heart Attack Warning Signs
• Chest discomfort (pressure, squeezing in the center of the chest) that lasts more than a few minutes or comes and goes
• Discomfort in other parts of the upper body—arms, back, neck, jaw, stomach
• Shortness of breath
• Breaking into a cold sweat
• Nausea
• Lightheadedness

In both men and women, the most common heart attack symptom is chest pain but women are more likely to experience the other symptoms listed above.

Source: American Heart Association