

## 8TH-12TH GRADE TOOLKIT

### TIPS FOR PRESENTATION STYLE

- This age group is super tech savvy, so it may be a lost cause trying to appeal to tech heavy presentation style.
- School can be monotonous for this age group, try to use a light approach.
- Ask the teacher (if able) if the students have had any human anatomy or biology discussion of heart anatomy. If so, you may want to review this more quickly and go deeper into hypertension or heart disease.

### INTRODUCING FAMILY MEDICINE (5-10 min)

- ASK!
  - Raise your hand if you know what career you want to have.
  - Raise your hand if you want to help people in your career.
  - Raise your hand if you like solving problems.
  - Raise your hand if you like making friends.
  - Raise your hand if you like playing on a team.
- These are the qualities of a great family doctor!
- What do you think doctors do? What have you seen doctors do?
- Path to medicine isn't a straight line!
  - Tell students about how you decided to do Family Medicine and any bumps in the road. Students want to know that doctors are like them and also have struggles!

### HEART HEALTH (20-30 min)

- Teach! Either draw a basic heart diagram on the board as you speak or [use this blank heart image on presentation](https://www.sciencelearn.org.nz/labelling_interactives/1-label-the-heart) ([https://www.sciencelearn.org.nz/labelling\\_interactives/1-label-the-heart](https://www.sciencelearn.org.nz/labelling_interactives/1-label-the-heart) - also interactive if you want to use the live site)
- [Fun cardiac rap video https://youtu.be/LqhvumUEdOYY](https://youtu.be/LqhvumUEdOYY)
  - Who can name the four parts of the heart?
  - What is the purpose of the heart?
  - The human heart is similar to the hearts of other vertebrates. Mammals and birds (and some reptiles) have what is known as a double-loop circulatory system, where blood leaves the heart, goes to the lungs where it becomes oxygenated and then returns to the heart before delivering the oxygenated blood to the rest of the body.
  - Blood that has traveled through the body supplying nutrients to tissues eventually returns to the heart through the superior vena cava and the inferior vena cava. Blood then enters the right atrium, where a small contraction pushes blood through the tricuspid valve, and into the right ventricle.



- From the right ventricle, blood is pushed out through the pulmonary valve and into the pulmonary trunk. This artery branches into two arteries, the left pulmonary artery and the right pulmonary artery which will deliver the blood to the lungs where it will become oxygenated.
- *Oxygenated blood returns from the lungs through the left and right pulmonary veins which empties into the left atrium.*
- *From the left atrium, blood goes through the mitral valve and enters the most muscular part of the heart, the left ventricle. A powerful contraction of the left ventricle will send blood through the aortic valve and into the largest artery of the body, the aorta.*
- *Blood enters the aorta and will travel to the head and shoulders through three smaller arteries. The aorta forms an arch as blood is routed to the lower part of the body where it oxygenates organs and muscles.*

• Do!

- Let's practice listening to the heart. Ask for volunteers to be the listener and the patient (may be easier with a male to auscultate the mitral valve).
- "We can actually hear the valves in different locations. We check all these locations if we hear a funny heart sound (called a murmur), to try to see which valve the funny sound is coming from."
- We learned a funny mnemonic in medical school to remember the placements - A PeT Monkey!
- Demonstrate Aortic, Pulmonic, Tricuspid, and Mitral locations.
- [Youtube video demonstration](https://youtu.be/K_BWCw7s1Xo) option: [https://youtu.be/K\\_BWCw7s1Xo](https://youtu.be/K_BWCw7s1Xo)
- We can also measure the pulse as a way to see how the heart is beating. Can you find your pulse?
  - Give a tip to feel with first two fingers.
  - Help guide students to find radial pulse, carotid pulse, or even PT or DP pulses.

• Teach!

- Let's talk about what doctors look for when heart problems come up. To do that, we need to talk a little more about how the heart itself is controlled.
- Inside the walls of the heart are the electrical wires of the heart, just like electrical wires in our walls here! This electrical system tells the parts of the heart when to squeeze and when the doors can open and shut.
- The heart is a very strong muscle. And muscles need oxygen and energy molecules (remember ATP?) to contract. The heart is fed through its own arteries (called coronary arteries surrounding the heart muscle from the outside), like roots on a tree.
- [Image of coronary arteries](https://watchlearnlive.heart.org/?moduleSelect=corart): <https://watchlearnlive.heart.org/?moduleSelect=corart>

A basic principle of medicine is "what could go wrong?"

- Does anyone have any guesses of what could go wrong with the heart?
- Heart problems usually fit into these categories: electrical problems, problems with the heart squeezing blood out, or problems with the heart not getting enough blood supply itself.
- We check your pulse to see if the electrical activity is not normal. Electrical problems can cause your heart beat to feel fast (the fancy word for this is tachycardia or palpitations), to skip beats (called arrhythmia), or to beat out of turn (the most common type of this is called atrial fibrillation or afib).

- We won't talk too much about the electrical problems as these are usually related to family history. But that's why your doctor checks your pulse, or an EKG (graph of the electrical activity) and asks about your family's heart history.
- The function of the heart is where most of the heart disease in America comes into play.
  - Is heart disease the number 1, 2, or 3 cause of death in the US? (answer = 1st)
- We run into problems when the coronary arteries and the ventricles don't work properly. Let's explore these.
  - [Cholesterol and coronary artery disease interactive demo:](https://watchlearnlive.heart.org/index.php?moduleSelect=chlcad) <https://watchlearnlive.heart.org/index.php?moduleSelect=chlcad>
  - Cholesterol plaques are related to dietary intake of cholesterol and fats. Sometimes genetics and family history can make your body more likely to hold on to these deposits.
  - [Heart attack interactive anatomy demo:](https://watchlearnlive.heart.org/?moduleSelect=hrtatk) <https://watchlearnlive.heart.org/?moduleSelect=hrtatk>
  - Heart attacks can have lots of symptoms - chest pain, shortness of breath, less ability to exercise than before. This is why we do several tests when adults have chest pain.
  - [Share the Heart failure anatomy interactive demo:](https://watchlearnlive.heart.org/index.php?moduleSelect=highbp) <https://watchlearnlive.heart.org/index.php?moduleSelect=highbp>
  - Heart failure limits adults from doing things they want to do. They become more short of breath, they can't go up stairs as easily as they could before, and their legs often swell up and get uncomfortable. Usually they have to take about 10 pills, often multiple times per day to keep their heart functioning.
- Could consider inserting a short conversation about smoking increasing your risk of heart disease here if time allows.

### EAT SMART, MOVE MORE! (15-20 min)

- Why do doctors care about healthy eating?
  - We see lots and lots of patients every day who have the heart problems we just talked about. And they are sad because they can't do the things they used to be able to, or because their medicines cost a lot, or sometimes make them feel bad. Often we are even sad with family members when they lost someone to heart disease.
  - Our goal is to help patients like you learn how to keep themselves healthy!
- What does eating healthily do to help your body?
  - What does drinking water do for your body?
    - Allow time to answer.
    - Water is necessary for the function of every cell in your body. Also, water helps keep you hydrated, which keeps your heart rate normal and your blood pressure normal. Water keeps your kidneys receiving enough blood, which keeps them functioning well. Not drinking enough water can cause things like headaches, urinary infections, passing out, funny heart rhythms, and more!
    - Doctors like me would like for water to be the main thing you drink! Occasional treat drinks are ok, but we know that sugar and calories that don't add to your nutrition can be harmful.
  - What do vegetables do for your body?
    - Allow time to answer.

Vegetables add lots of vitamins to your diet, which help cells function. Vegetables also add fiber, which helps with digestion and having normal bowel movements.

There are research studies to show that diets high in vegetables can help keep the heart healthy as well.

Some foods can contribute to heart disease. Not that you can never eat these, but we should consider eating them very rarely. Trans fats seem to be the most dangerous. They are actually banned in many European countries! Artificial trans fats (or trans fatty acids) are created in an industrial process that adds hydrogen to liquid vegetable oils to make them more solid. Trans fats are easy to use, inexpensive to produce and last a long time. Trans fats give foods a desirable taste and texture. Many restaurants and fast-food outlets use trans fats to deep-fry foods because oils with trans fats can be used many times in commercial fryers. Trans fats can be found in many foods – including fried foods like doughnuts, and baked goods including cakes, pie crusts, biscuits, frozen pizza, cookies, crackers, and stick margarines and other spreads. You can determine the amount of trans fats in a particular packaged food by looking at the Nutrition Facts panel.

- Consider bringing a snack food with trans fats listed on the label as an example.
- We have medical studies showing the trans fats are associated with heart disease and stroke.

- Move more.

Exercise not only helps keep your heart and lungs healthy, but also has benefits for mood, sexual health, and more.

The American Heart Association recommends Aim for at least [150 minutes of moderate physical activity](#) or 75 minutes of vigorous physical activity (or an equal combination of both) each week.

It's important to find an exercise that you LIKE because that is the best one for you. Every little bit of exercise is great work!