MODULE 7:
ACTIVITY 2D: HOW TO TAKE A BLOOD PRESSURE

DIRECTIONS:

1. Deflate the bladder of the cuff and place it around the person's upper arm so it fits snugly, but not too tightly. If you're right-handed, you should hold the bulb/pump in your left hand to inflate the cuff. Hold it in your palm so your fingers can easily reach the valve at the top to open and close the outlet of the air bladder (the part wrapped around your partner's arm).
2. Put the head (flat part) of the stethoscope just under the edge of the cuff, a little above the crease of the person's elbow. Hold it there firmly with your thumb or with a few fingers of your right hand. Put the ear pieces of the stethoscope in your ears; be sure to wipe the ear pieces off with alcohol before you put them in your ears.
3. Inflate the cuff with brisk squeezes of the bulb. Watch the pressure gauge as you do so. For most kids, you shouldn't need to go over 150; for adults, 180. (The markings indicate "pressure" in mm Hg, or mercury).
4. *Slightly* open the valve on the air pump (held in your left hand). This part takes practice! It's important that you don't let the air out too suddenly. Likewise, your partner will be quite irritated with you if you let it out too slowly!
5. Pay attention to what you hear through the stethoscope, as the needle on the pressure gauge falls. You will be listening for a slight "blrrrp" or something that sounds like "prrpshh". The first time you hear this sound; note what the reading was on the pressure gauge. This value represents the **systolic blood pressure**.
6. The sounds should continue and become louder in intensity. Note the pressure reading when you hear the sound for the last time. This value represents the **diastolic blood pressure**.
7. Afterwards, open the air valve completely to release any remaining pressure.
8. Record the first and last sounds heard, for example: 120/80.

In adults, hypertension (high blood pressure) is defined as repeated BP readings greater than 140/90. However, kids should have BP readings lower than the normal values for adults.

BACKGROUND

Blood pressure varies relative to the heart's thumping of blood. The heart should be thought of as a dual pump, with a right and a left side. ***Systole*** represents the active pumping of blood from the **ventricles** into the circulation. The right side of the heart takes venous/returning blood from the body and sends it to the lungs to be oxygenated (***pulmonary circulation***). Measuring blood pressures on the right side of the heart requires very complicated equipment. The left side of the heart takes the oxygenated blood and sends it to the rest of the body. When you take a blood pressure reading, you measure pressures in the ***systemic circulation***.

The highest pressures occur during systole as blood is ejected into the ***aorta*** and subsequent arteries of the body. ***Diastole***, the heart's resting phase, follows systole. During diastole, the ventricles fill with more blood. Systemic pressures fall until more blood is ejected during systole.

THE EFFECT

The blood pressure cuff lets you apply external pressure to a circumferential ring around the upper arm. When the pressure is great enough, it forcibly closes the main artery of the upper arm—the ***brachial artery***. The stethoscope allows you to hear when the underlying artery opens and closes as you release the air in the bladder.

For example, consider a blood pressure reading of 120/80. The first number always represents ***systolic pressure*** (120 mm Hg), and the second number ***diastolic pressure*** (80 mm Hg). When you apply a pressure of 180 mm Hg to the arm, the 120 mm of pressure from the artery cannot overcome your externally applied pressure; the artery stays shut.

As you release the air out of the cuff, the external pressure falls. At 150 mm Hg, the artery is still closed, but at 119 mm Hg, it can open for just the slightest instant as the maximum/systolic pressure exceeds the applied pressure. Once the arterial pressure falls below 119 mm, however, the artery shuts again. This opening and shutting produces the sounds you hear through the stethoscope (Korotkoff sounds). When the applied pressure falls below the diastolic/resting pressure, the artery stays open all the time.