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Anatomy and Physiology

Cardiovascular Unit, Create a catheter lab

Cardiovascular System

Building a Catheter

ESSENTIAL QUESTION

How to deliver a product to the heart without opening the thoracic cage.

ABSTRACT- After watching videos of Medtronic products, and with prior knowledge of the structures of the Cardiovascular system, students will use commonplace items to create a catheter and deliver material into a ventricle of the heart. This activity is based off standard 4 and SIS2 and SIS3 of the Massachusetts Biology High School Standards.

OBJECTIVES

Students will be able to demonstrate their knowledge of the anatomy of the cardiovascular system by designing a delivery system made of commonplace items to transport a product of their choice into either the right or left ventricle.

Students will design their product to attach to the muscle wall of their chosen chamber

Students will determine their level of success upon completion of the heart dissection and analyze their created product as a success or failure, and write a “product evaluation” of how to improve on their design.

ASSESSMENT

Students will be informally assessed on the grounds of teamwork, and time management,

Students will be formally assessed on the success of their product and the coinciding product evaluation

VOCABULARY

Artery- vessel leading away from heart

Vein- vessel returning to heart

Capillary- exchange vessel connecting artery and vein

Ventricle- pumping area of heart

Atrium- receiving area of heart

Aorta

Inferior Vena Cava

Pulmonary- lungs

Catheter- Tube used for medical functions

LESSON

Day 1

As a Capstone to our chapter on the cardiovascular system students will connect the structures and functions of the cardiovascular system to products built by the local medical company Medtronic. This activity will be introduced by a basic company introduction to Medtronic and a description of how the catheters built in the Danvers Site allow doctors worldwide to perform internal tests and procedures on their patients with less invasive products resulting in less time for recovery and fewer side effects. The students will be shown the video of the internal pacemaker released by Medtronic.

At this point students will be grouped into their dissecting groups. With their groups, students will be asked to come up with a way to set a product of their choice into either the Right Ventricle through the inferior Vena Cava through the Right Atrium or into the Left Ventricle through the Aorta, around the Aortic arch. Students will be creating their catheters with household products. Students will get their hearts to take dimensions and angles.

Day 2

Students will build their products and catheters the next day in class. They will assemble a materials list and a basic build guide.

Day 3 Dissection Day

Students will use their Catheter and deliver their products into their heart at the beginning of their dissection. The students will then preform the dissection to see if their product remained in the Myocardium throughout the dissection. Students will open the chamber of the heart their product is in in front of the class to guarantee their results accurately. Students will complete the dissection. For homework students will complete a product evaluation on what went right and what went wrong with their product. They will recommend how their product could be improved.