

Human Circulation Chapter

Experiments

Basic Level Difficulty Rating: Can Be Done With:

HC-1: Blood Pressure, Peripheral Circulation and Body Position

HC-2: Blood Pressure, Peripheral Circulation and Imposed Conditions

Advanced Level Difficulty Rating: Can Be Done With:

HC-3: Pulse Wave Velocity

HC-4: Pulse Contour Analysis

Extra Circulation Labs

HC-5: Body Position, Exercise and Cardiac Output

HC-6: Effects of Temperature on Peripheral Oxygen Saturation

Overview

In a normal human heart, the right ventricle creates pressure to propel the blood through the pulmonary arteries to the lungs. Once the blood is oxygenated by the lungs and returns to the heart, the left ventricle creates a greater pressure that propels the blood through the aorta and the systemic arteries to the organs and muscles of the body ([Figure HC-0-II](#)).

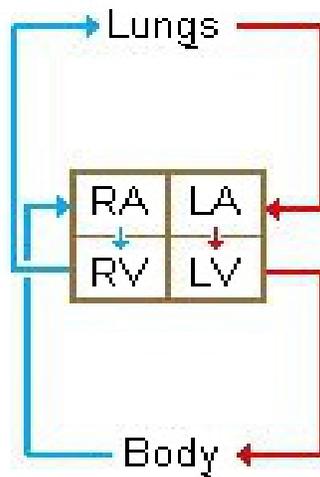


Figure HC-0-II: A diagram to show the circulation of blood around the human body and its association with the heart, composed of a right atrium (RA), a left atrium (LA), a right ventricle (RV), and a left ventricle (LV).

The composition of the walls of the large arteries give them the ability to distend and dampens the dramatic pressure changes created when the ventricle ejects blood into the arteries. Arteries close to the heart distend with each ventricular contraction, they cushion the circulatory system from the large pressure waves generated by the ventricle. Elastin, one of the fibrous molecules that composes the arterial walls, stretches easily and uniformly distributes the pressure created by the ventricle across the artery wall. As the pressure in the artery and the diameter of the artery increase, the force inside the artery is gradually transferred to the more rigid collagen fibers that are also components of the arterial walls.

When the large arteries are expanded and the pressure inside the arteries is stored in the arterial walls, the arteries function as pressure reservoirs that are ready to release pressure for moving blood when the arterial walls recoil (Figure HC-0-12). The recoil of the arteries releases pressure which propels the blood from the large arteries and into the smaller arteries. Even though the large pressure waves generated by the ventricle are reduced by the distension of the aorta and other large arteries, the pulsatile recoil of the large arteries still causes the pulsatile flow of blood still occurs in smaller arteries and arterioles. Blood flow smooths to continuous laminar flow when the blood reaches the capillary beds.

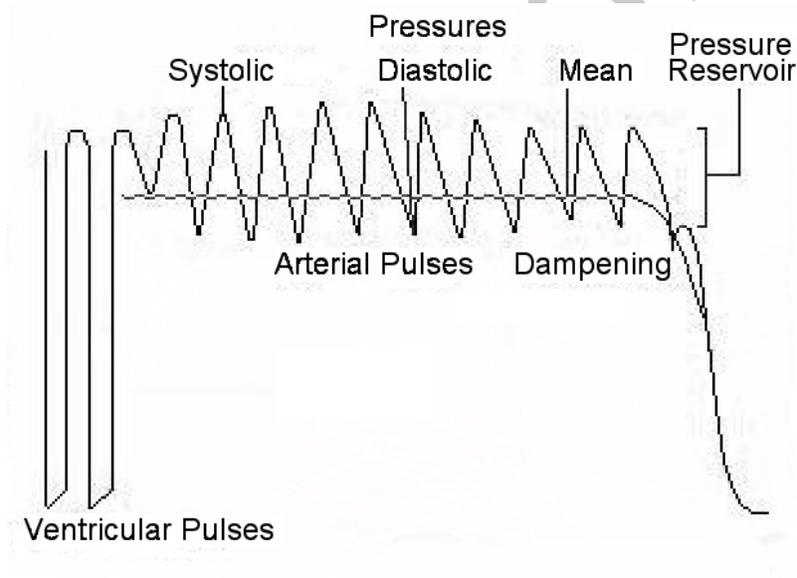


Figure HC-0-12: Dampening effect of aorta and large arteries on ventricular pressures due to the elasticity of these vessels.