Cardiac output

Cardiac output is the quantity of blood pumped into the aorta each minute by the heart and the quantity of blood that flows through the circulation.

Cardiac output is one of the most important factors that we have to consider in relation to the circulation because it is the sum of the blood flows to all of the tissues of the body.

For young, healthy men, resting cardiac output averages about 5.6 L/min. For women, this value is about 4.9 L/min.

Venous return

Venous return is the quantity of blood flowing from the veins into the right atrium each minute. The venous return and the cardiac output must equal each other except for a few heartbeats at a time when blood is temporarily stored in or removed from the heart and lungs.

Cardiac Index

Cardiac output is frequently stated in terms of the cardiac index, which is the cardiac output per square meter of body surface area. The normal human being weighing 70 kilograms has a body surface area of about 1.7 square meters, which means that the normal average cardiac index for adults is about 3 L/min/m2 of body surface area.

Factors affecting Cardiac Output

The following factors, among others, directly affect cardiac output:

(1) the basic level of body metabolism,

(2) whether the person is exercising,

(3) the person's age, and

(4) size of the body.

Regulation of Cardiac Output

The venous return to the heart is the sum of all the local blood flows through all the individual tissue segments of the peripheral circulation. Therefore, it follows that cardiac output regulation is the sum of all the local blood flow regulations. In most tissues, blood flow increases mainly in proportion to each tissue's metabolism. At each increasing level of work output during exercise, the oxygen consumption and the cardiac output increase in parallel to each other. To summarize, cardiac output is determined by the sum of all the various factors throughout the body that control local blood flow. All the local blood flows summate to form the venous return,

and the heart automatically pumps this returning blood back into the arteries to flow around the system again.