

## The Cardiovascular System

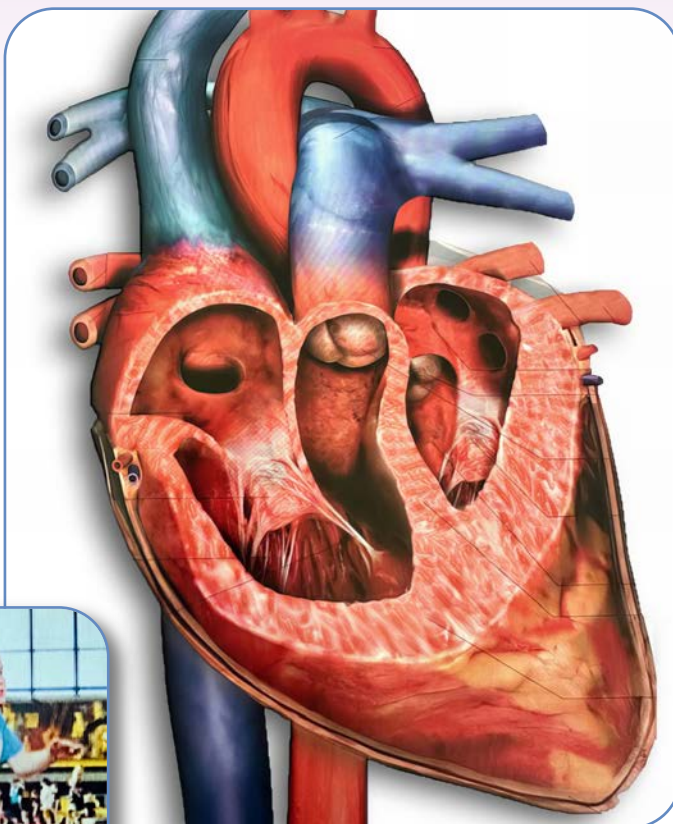
**W**e have 12 bodily systems. They are all essential to our multi-decade well-being. We inherited them, via DNA and our family tree, from the Tree of Life. All animals, without exception, have hearts and blood vessels, i.e. cardiovascular (CV) systems. Nature has worked out the assembly, maintenance, and functional controls so that cardiovascular systems are very accurate and reliable. The cardiovascular system has a very important function: getting oxygen and nutrients to all the cells in the body, and removing waste products. The components of your CV system are heart, blood vessels, and blood.

The heart is a marvelous, muscular pump. It works non-stop, life-long! Its rhythmic contractions send blood through our large arteries, branching to smaller arteries, eventually to microscopic size. The microvessels between arteries and veins are capillaries. They are small enough to let oxygen molecules, glucose molecules, and other micronutrients diffuse to the intercellular fluid, and into all the cells.

Waste products, like CO<sub>2</sub> and urea, diffuse back into capillaries, that lead to the venous system (our veins) and back to the heart. Oxygen-rich blood is bright red. Venous blood is dark maroon in color.

Venous blood enters the right side of the heart and gets sent to the lungs through pulmonary arteries. Oxygenated blood returns to the heart via pulmonary veins. It enters the left chambers of the heart, and gets pumped all around the body. Waste products reach the lungs, kidneys, and liver, and get excreted.

On average, our heart beats about 100,000 times a day. The amount of blood pumped per day is approximately 2,000 gallons, the size of a large tanker truck! About 10% of the heart's production goes to the lungs. The heart pumps blood to itself through the coronary arteries. Important valves exist, inside of and at the exiting arteries, to keep blood flowing in the right direction. An electrical



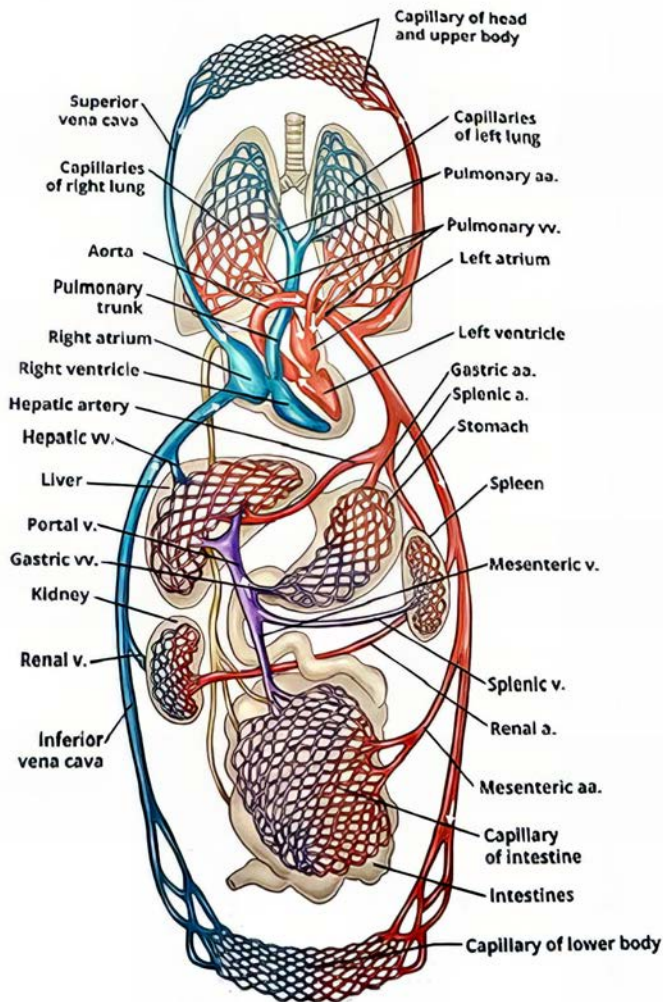
system is present, with a biologic pacemaker that works incessantly!

In all the world's cultures, the heart is associated with love, compassion, courage, and resilience. Did you know the word *courage* stands for "the coming

of age of the heart"? We are thankful for the most important things "from the bottom of our heart." We do our most important tasks "wholeheartedly." Our "hearts go out" to people who have borne great difficulties to help others. Coping well under difficult circumstances says you have "heart." The strength of one's mettle is a measure of one's "heart." People who are generous and give of themselves are "good-hearted." Being generous and kind can be seen as "paying it forward," i.e. related to gratitude. The things we are most grateful for, and most uplifted by, are felt as "heartening." The Hindu expression "Namaste" might be interpreted as: "My heart goes out to your heart."

All of these expressions show a great basis of gratitude for all the awesome things that our heart

# Systemic Circulation



should be 30 minutes or more per day, 5-to-7 days a week.

- If you are over 50 and have not exercised very much, it is advisable to get a Treadmill Test, with an expert interpretation, before embarking on an exercise program.

In conclusion, the cardiovascular system is a wonder of DNA and evolution. It is a marvel of self-regulation. It will give us a lifetime of

good service if we give it love and respect and live a pro-wellness lifestyle. ■

— *Namaste!*

and blood vessels do. We need their good work every minute and every second. All our activities and sensing and thinking rely on good circulation.

How can we take care of our awesome CV system?

1. Give it enough water/fluids and the nutrients of a heart-healthy diet.
2. A heart-healthy diet is high in fruits and vegetables and whole grains, and low in saturated fats and trans-fats. The diet most consistent with heart health is the Mediterranean Diet.
3. Give it regular exercise. Moderate aerobic exercise

*Dr. Shapiro is a career clinic physician who has utilized relaxation techniques with many of his patients. His YouTube channel is:*

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