

Key Concepts: Aging of the Internal Organ Systems I: Cardiovascular and Respiratory Systems

Welcome to Aging of the Internal Organ Systems I! In this module, we will learn about the basic anatomy and physiology of the cardiovascular and respiratory systems and age-related changes in and diseases of these two systems.

(Taken from Aldwin et al (2017). *Health, illness and Optimal Aging*. New York, NY: Springer and the PPT for this module).

Key Concept 1: Basic anatomy and physiology of the cardiovascular system (Aldwin, et .al., 2017):

- Consists of the heart and blood vessels and circulates blood throughout the body. Please carefully review the basic anatomy and physiology of the cardiovascular system in the text and PPT.

Key Concept 2: Age-related changes in the cardiovascular system (Aldwin, et .al., 2017):

- Loss of heart's pacemaker cells leading to slowing of electrical activity in heart
- Enlarged heart mass due to increased size of heart muscle cells.
- Arteriosclerosis in large arteries
- Decreased efficiency of heart function

These changes can be alleviated to a degree through regular exercise.

Key Concept 3: Cardiovascular System-Related Diseases (Aldwin, et .al., 2017):

- **Blood pressure measurement:** consists of measuring the systolic pressure (pressure of the blood traveling through the arteries during a heart beat or when the heart pumps blood) and diastolic pressure (pressure of the blood traveling through the arteries when the heart is at rest or in between heart beats).
- **Hypertension:** BP that is consistently elevated above 140 mm Hg systolic pressure and 90 mm Hg diastolic pressure. Hypertension can be dangerous since it is asymptomatic and has serious health consequences if left untreated. Treatment consists of low-sodium diet, exercise, and if necessary antihypertensive medications are prescribed.
- **Atherosclerosis:** Build-up of fat deposits/cholesterol in the arteries causing damage to inner lining of artery possibly leading to blood clots or hemorrhaging in the artery.
- **Coronary heart disease:** Due to atherosclerosis in the coronary arteries which lie on and provide the heart with oxygenated blood. Leading cause of heart disease. One hallmark symptom is angina pectoris or chest pain which indicates the flow of blood to the heart is impeded. Can lead to myocardial infarction or heart attack and damage the heart muscle, eventually leading to heart failure.
- **Heart failure:** Due to damage of the heart muscle, the heart is not able to effectively and efficiently pump blood to the rest of the body.

- **Peripheral vascular disease:** Partial or complete blockage of the flow of blood due to atherosclerosis in the legs and feet. Often due to smoking. Treatment is exercise and smoking cessation.

Key Concept 4: Promoting Optimal Aging of the Cardiovascular System (Aldwin, et .al., 2017):

- Heart healthy diet such as the Mediterranean diet with very little if any red meat, lots of fruits and vegetables, heart healthy oils such as polyunsaturated vegetable oil or monounsaturated olive or canola oil, fish, nuts, and whole grains. Also, aerobic exercise and no smoking are important.

Reference

Aldwin, et al (2017). *Health, illness, and optimal aging*. New York, NY: Springer.