6.15: Glossary

Afterload: The tension that the ventricles must develop to pump blood effectively against the resistance in the vascular system.

Anticoagulant: Any substance that opposes coagulation.

Arrhythmia: A deviation from the normal pattern of impulse conduction and contraction of the heart, which if serious and untreated, can lead to decreased cardiac output and death.

Arteriosclerosis: A condition when compliance in an artery is reduced and pressure and resistance within the vessel increase. This is a leading cause of hypertension and coronary heart disease, as it causes the heart to work harder to generate a pressure great enough to overcome the resistance.

Artery: A blood vessel that carries blood away from the heart (except for pulmonary arteries that carry oxygenated blood from the lungs back to the heart).

Atherosclerosis: A buildup, called plaque, that can narrow arteries enough to impair blood flow.

Blood pressure: A type of hydrostatic pressure, or the force exerted by blood on the walls of the blood vessels or the chambers of the heart.

Capillaries: Smallest arteries where nutrients and wastes are exchanged at the cellular level.

Cardiac Output (CO): To calculate this value, multiply stroke volume (SV), the amount of blood pumped by each ventricle, by heart rate (HR), in contractions per minute (or beats per minute, bpm). It can be represented mathematically by the following equation: \( CO = HR \times SV \).
Cerebrovascular Accident (CVA): Lack of blood flow to the brain that can cause irreversible brain damage, often referred to as a "stroke."

Coagulation: The formation of a blood clot.

Compliance: The ability of any compartment to expand to accommodate increased content. The greater the compliance of an artery, the more effectively it is able to expand to accommodate surges in blood flow without increased resistance or blood pressure. Veins are more compliant than arteries and can expand to hold more blood. When vascular disease causes stiffening of arteries, compliance is reduced and resistance to blood flow is increased.

Contractility: The force of contraction of the heart.

Diastole: The period of relaxation that occurs as the chambers fill with blood.

Edema: The presence of excess tissue fluid around the cells.

Embolus: When a portion of a thrombus breaks free from the vessel wall and enters the circulation. An embolus that is carried through the bloodstream can be large enough to block a vessel critical to a major organ. When it becomes trapped, an embolus is called an embolism. In the heart, brain, or lungs, an embolism may accordingly cause a heart attack, a stroke, or a pulmonary embolism.

Fibrillation: An uncoordinated beating of the heart, which if serious and untreated, can lead to decreased cardiac output and death.

Fibrinolysis: The gradual degradation of a clot.

Hemostasis: The process by which the body temporarily seals a ruptured blood vessel and prevents further loss of blood.

Hyperlipidemia: Elevated cholesterol levels in the blood that increase a patient's risk for heart attack and stroke.

Hypertension: Chronically elevated blood pressure.

Hypervolemia: Excessive fluid volume caused by retention of water and sodium, as seen in patients with heart failure, liver cirrhosis, and some forms of kidney disease.

Hypovolemia: Decreased blood volume that may be caused by bleeding, dehydration, vomiting, severe burns, or by diuretics used to treat hypertension. Treatment typically includes intravenous fluid replacement.

International Normalized Ratio (INR): A blood test used to monitor the effects of warfarin and to achieve therapeutic range, generally between 2.0 and 3.5 based on the indication.

Ischemia: Reduced blood flow to the tissue region “downstream” of the narrowed vessel.

Loop of Henle: A component of the nephron where loop diuretics act to eliminate sodium and water.

Myocardial Infarction (MI): Commonly referred to as a heart attack, resulting from a lack of blood flow (ischemia) and
oxygen to a region of the heart, resulting in death of the cardiac muscle cells.

**Negative Inotropic factors:** Factors that decrease contractility.

**Partial Thromboplastin Time (PTT):** A blood test used to monitor how long it takes for a patient’s blood to clot. PTT is used for patients receiving IV heparin therapy to achieve therapeutic range. Dosage is considered adequate when the activated partial thromboplastin time (APTT) is 1.5 to 2 times the normal or when the whole blood clotting time is elevated approximately 2.5 to 3 times the control value.

**Positive inotropic factors:** Factors that increase contractility.

**Preload:** The amount of blood in the atria just prior to atrial contraction.

**Prothrombin Time (PT):** A blood test that measures how long it takes for a patient’s blood to clot. PT is used to monitor the effects of warfarin in preventing clot formation.

**Renin-Angiotensin-Aldosterone System (RAAS):** Renin converts the plasma protein angiotensinogen into its active form—Angiotensin I. Angiotensin I circulates in the blood and is then converted into angiotensin II in the lungs. This reaction is catalyzed by the angiotensin-converting enzyme (ACE). Angiotensin II is a powerful vasoconstrictor, greatly increasing blood pressure. It also stimulates the release of ADH and aldosterone, a hormone produced by the adrenal cortex. Aldosterone increases the reabsorption of sodium into the blood by the kidneys, causing reabsorption of water and increasing blood volume and raising blood pressure.

**Sinoatrial (SA) node:** Normal cardiac rhythm is established by the sinoatrial (SA) node. The SA node has the highest inherent rate of depolarization and is known as the pacemaker of the heart.

**Sinus rhythm:** Normal electrical pattern followed by contraction of the heart.

**Stroke Volume (SV):** The amount of blood that both ventricles pump during each contraction, normally in the range of 70–80 mL.

**Systole:** The period of contraction that the heart undergoes while it pumps blood into circulation.

**Thrombus:** An aggregation of platelets, erythrocytes, and WBCs trapped within a mass of fibrin strands that adhere to the vessel wall and decrease the flow of blood or totally block the flow of blood.

**Transient Ischemic Attack (TIA):** Occurs when blood flow is interrupted to the brain, even for just a few seconds, resulting in loss of consciousness or temporary loss of neurological function.

**Veins:** Blood vessels that conduct blood toward the heart (except for pulmonary veins that carry deoxygenated blood from the heart to the lungs).

**Venous reserve:** Volume of blood located in venous networks within the liver, bone marrow, and integument.