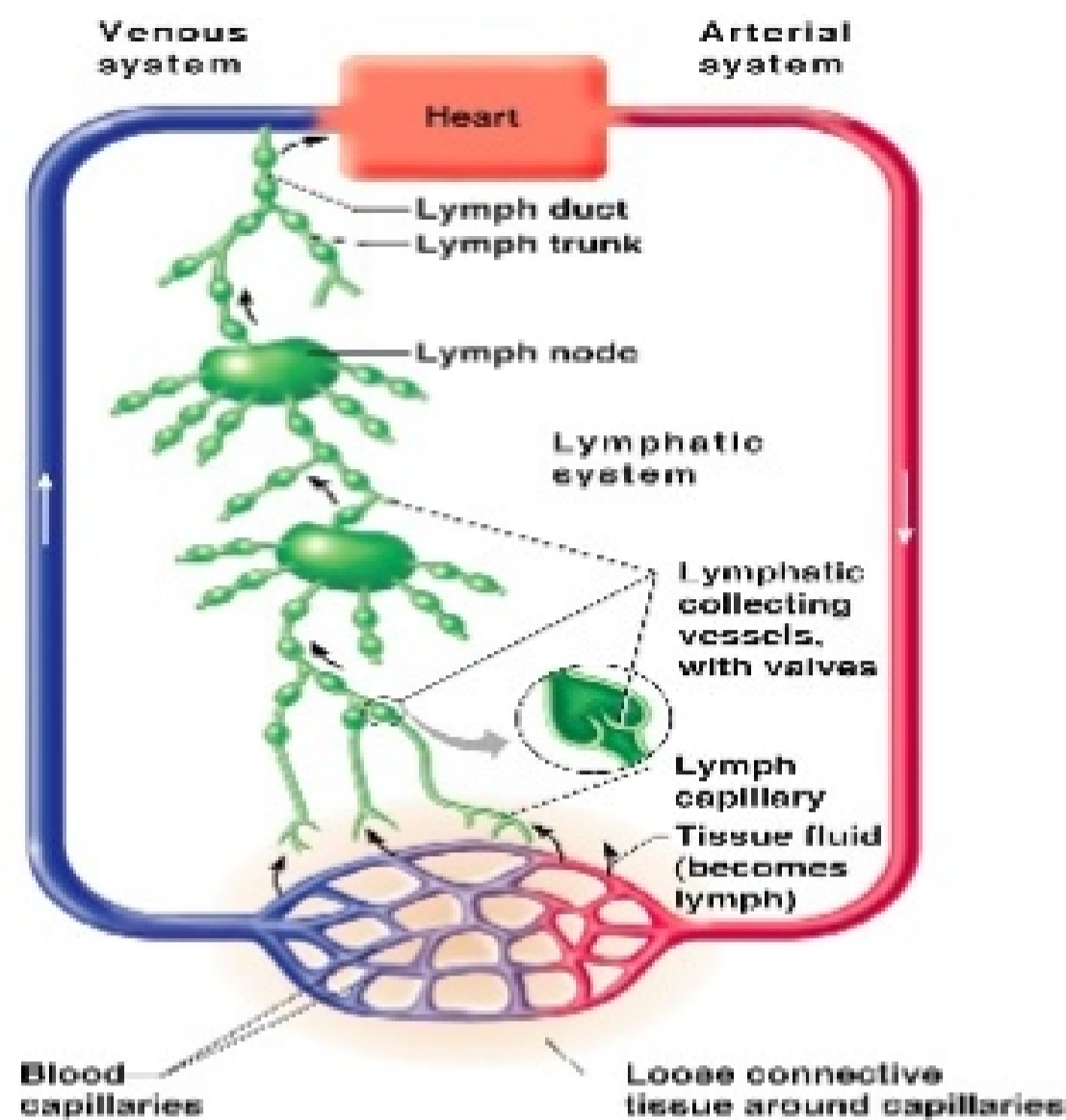


Chapter Summary

- One of the least recognized of the body systems, the lymphatic system has been gaining ground in recognition and understanding over the past two decades, largely due to research into AIDS, cancer, and autoimmune disorders. It is very important in fighting disease and maintaining healthy homeostatic balance within nearly all body system. Although at first unfamiliar to most, this system quickly piques their interest as a lifesaving system that deserves their attention.
- The two semi-independent parts of the lymphatic system are presented first, beginning with the lymphatic vessels and followed by the lymphoid tissues and organs. Next is a full description of body defenses, beginning with an explanation of the nonspecific defenses such as fever and the inflammatory response, which hinder the entry and spread of pathogens. Specific defenses then follow with special focus on the antigen-antibody response. Under immune system regulation, they destroy foreign cells. The cells of the immune system are also outlined and explained.
- The next section of the chapter discusses the two types of immune response. Humoral (antibody-mediated) immunity is described first, highlighting the various roles of B cells and explaining the differences between active and passive types of humoral immunity. Cellular (cell-mediated) immunity is presented next, along with a description of the role T cells play in this type of immune response.
- The final section of this chapter discusses homeostatic imbalances of the immune system. Organ transplantation and its associated risk of rejection are explained, along with allergies, immunodeficiencies, and autoimmune disorders. Finally, in discussing the developmental aspects of the lymphatic system, there is an explanation that our immune system begins to wane in later life, making us more susceptible to cancer, as well as autoimmune and immunodeficiency diseases.

The Lymphatic System:

- Consists of two parts
 - Lymphatic vessels
 - Lymphoid tissues and organs
- Lymphatic system functions
 - Transports escaped fluids back to the blood
 - Plays essential roles in body defense and ***** to disease
 - Also has a role in digestion



Developmental Aspects of the Lymphatic System and Body defenses:

- Except for the thymus and spleen, the lymphatic organs are poorly developed before birth
- A newborn has no functioning lymphocytes at birth, only passive immunity from the mother
- If lymphatic's are removed or lost, severe edema results, but vessels MAY grow back in time

Central Lymphoid Tissue:

Bone Marrow + Thymus = Central Lymphoid Tissue

- Bone Marrow
 - o Hematopoietic stem cells: precursor for all blood cells
 - o Leukocytes except T lymphocytes fully develop here
- Thymus
 - o T lymphocytes migrate from bone marrow to thymus
 - o Develop maturity in thymus

Peripheral Lymphoid Tissue

- ⊗ Spleen, lymph nodes, tonsils, adenoid, appendix, Peyer's patches
- ⊗ Collections of B cells, T cells, and macrophages
- ⊗ Function to trap microorganisms and foreign particles
- ⊗ Works to expose them to leukocytes in high concentrations
- ⊗ Spleen and lymph nodes filter blood and lymph

Lymphoid Organs That Contribute to Lymphatic Function

SPLEEN

- Located on the left side of the abdomen
- Filters blood and destroys worn out blood cells
- Forms blood cells in the fetus
- Acts as a blood reservoir

THYMUS

- Located low in the throat, overlying the heart
- Functions at peak levels only during childhood
- Produces hormones (like thymosin) to program lymphocytes

TONSILS

- Masses of lymphoid tissue around the pharynx
- Trap and remove bacteria and other foreign materials
- Tonsillitis is caused by congestion with bacteria

PEYER'S PATCHES

- Found in the wall of the small intestine & capture and destroy bacteria in the intestine

Lymph Nodes

- Filters lymph (fluid) before it is returned to the BLOOD
- Defense cells within lymph nodes
 - Macrophages engulf and destroy foreign substances
 - Lymphocytes provide immune response to antigens □

Some harmful materials that may enter lymph vessels:

- Bacteria
- Viruses