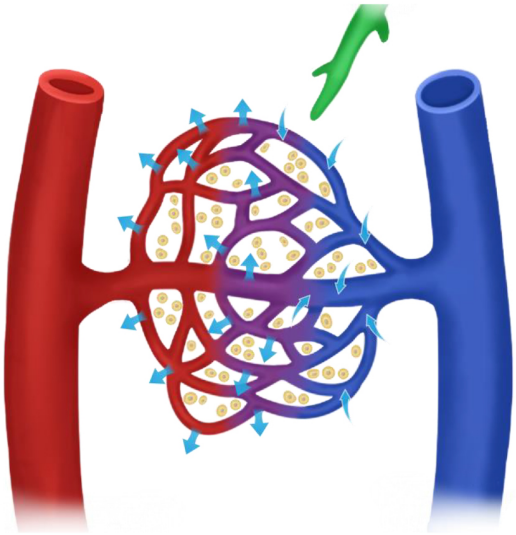
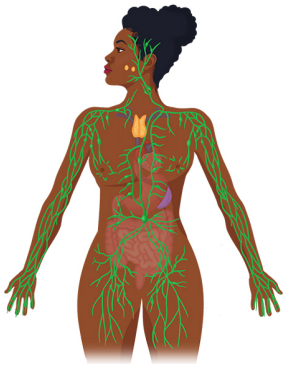
TOPIC: INTRODUCTION TO THE LYMPHATIC SYSTEM

Why Do We Need It?

- The cardiovascular system has a few inherent *limitations*:
  - High pressure forces some fluids/proteins to _____ out of blood capillaries.
  - High speed transport does _____ facilitate direct interactions between immune cells & pathogens.
  - Not effective at absorbing _____ macromolecules/substances.



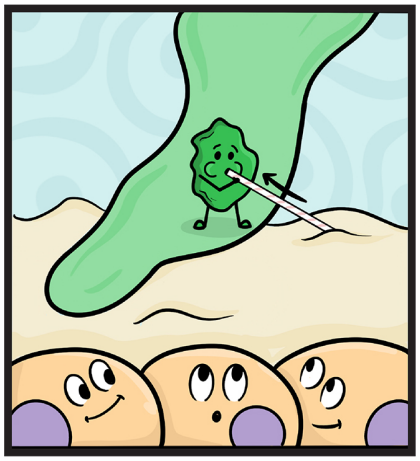
The _____ System functions to address many of these limitations.

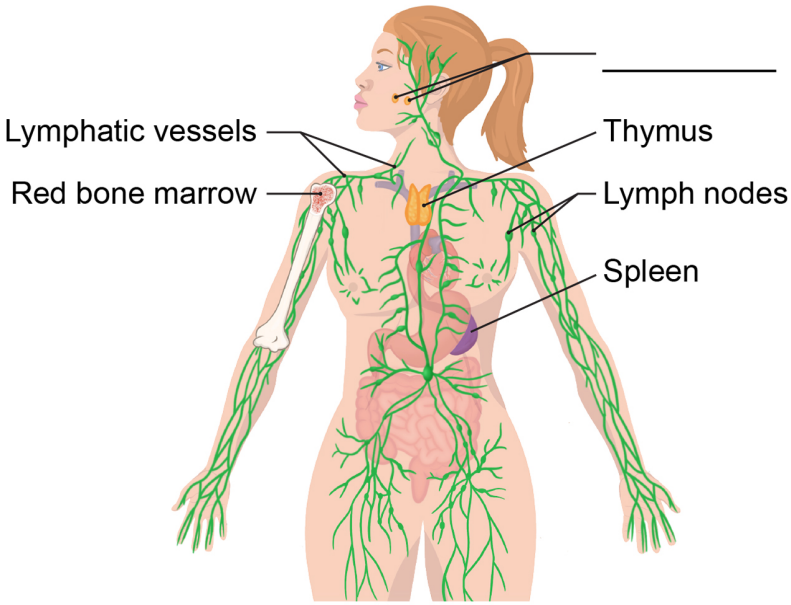


What Is It?

- **Lymphatic System:** network that _____ fluid balance, aids _____ & absorbs fat. It includes:
  1. **Lymph:** _____, colorless fluid formed when interstitial fluid enters lymphatic vessels.
  2. **Lymphatic Vessels:** tubes carrying lymph to veins near heart (_____ leaked fluids back to blood).
  3. **Lymphoid Tissues & Organs:** includes Lymph _____, Bone marrow, Thymus, Spleen, Tonsils, MALT.

Interstitial Fluid vs Lymph





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EXAMPLE

Which of the following is a limitation of the cardiovascular system that is solved by the lymphatic system?

a) The cardiovascular system cannot pump enough blood to skeletal muscle during intense exercise.

b) The cardiovascular system cannot absorb extremely small molecules.

c) Erythrocytes leak out of capillaries to deliver O_2 to tissues and not all of them re-enter.

d) Plasma leaks out of capillaries and not all of it re-enters.

PRACTICE

Which of the following is the difference between interstitial fluid and lymph?

a) Lymph originates in lymphatic vessels, while interstitial fluid originates in arterioles.

b) Lymph is the term given to interstitial fluid once it has entered the lymphatic vessels.

c) Lymph contains erythrocytes, while interstitial fluid does not contain erythrocytes.

d) Lymph contains leukocytes, while interstitial fluid does not contain leukocytes.

PRACTICE

One of the major functions of the lymphatic system is:

a) Elimination of carbon dioxide gas & nitrogenous wastes.

b) Hemostasis.

c) Maintaining fluid balance in the body by returning lost fluid back to the cardiovascular system.

d) Aiding in the delivery of O_2 to the tissues.

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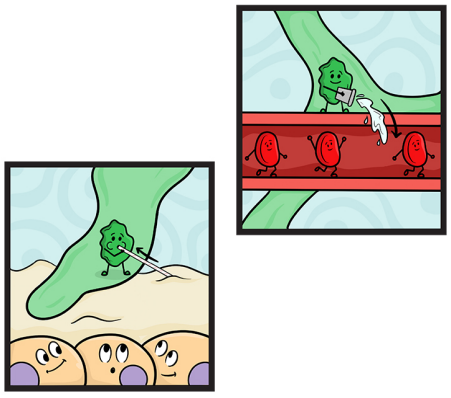
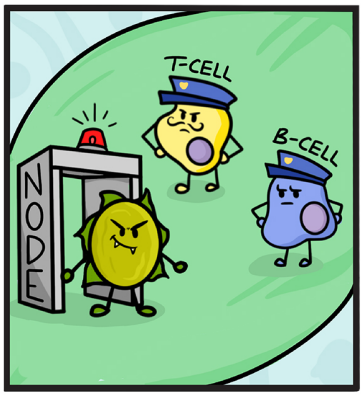
Functions of the Lymphatic System

◆ Lymphatic system has _____ primary functions:

1. Maintains fluid balance by _____ "lost" fluid & proteins back to cardiovascular system.
2. Produces, maintains, distributes, & supports _____ to aid immunity.
3. Absorbs _____ substances that cannot enter blood capillaries (ex. lacteals).

1 Maintains Fluid Balance	2 Aids Immune Function	3 Absorbs "Large" Substances (ex. Fat)
		

EXAMPLE

A patient comes to your office complaining of persistent & excessive swelling in their ankles. Which of the following is the most likely reason that they're experiencing this?

a) Impaired lymphatic drainage in their legs.

b) Excessive production of red blood cells.

c) Respiratory tract infection.

d) Lacteals not absorbing fat.

PRACTICE

The lymphatic _____ return fluid to the cardiovascular system, the lymphoid organs primarily aid _____ function, and _____ absorb fats that are too large to fit into capillaries.

a) Organs; immune; lacteals.

b) Vessels; immune; lymphatic vessels.

c) Vessels; fluid balance; lymphatic organs.

d) Vessels; immune; lacteals.