

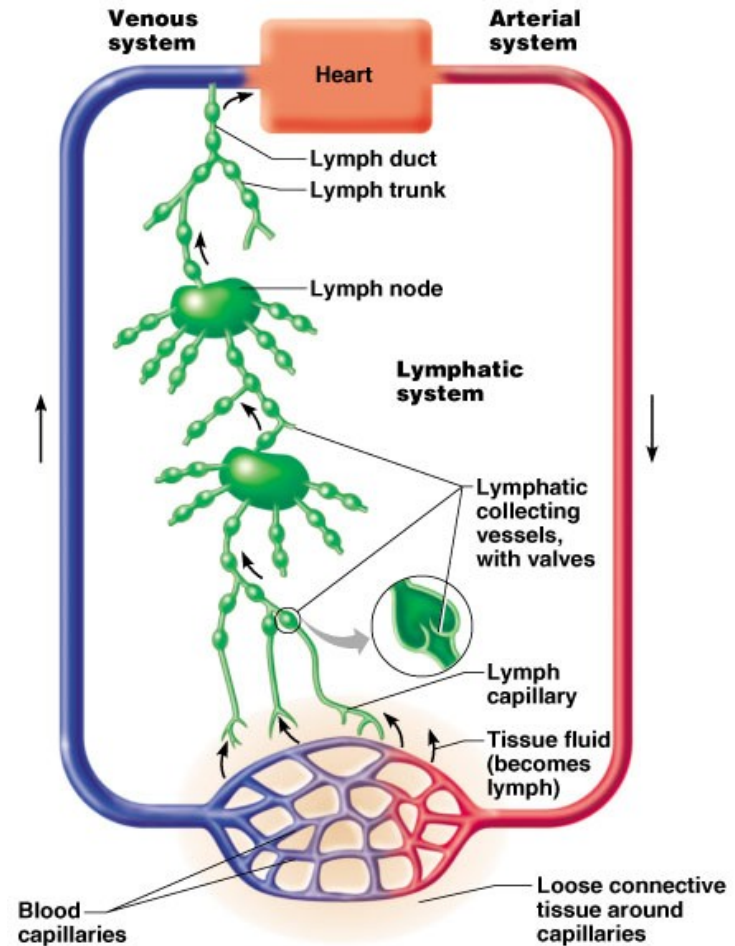
Anatomy & Physiology II

The Lymphatic System

Mr. Hildebrandt

The Lymphatic System

- Lymphatic system functions:
 - Transport clean fluids back to the blood
 - Drains excess fluids from tissues
 - Removes “debris” from cells of body
 - Transports fats from digestive system



When things go wrong.....

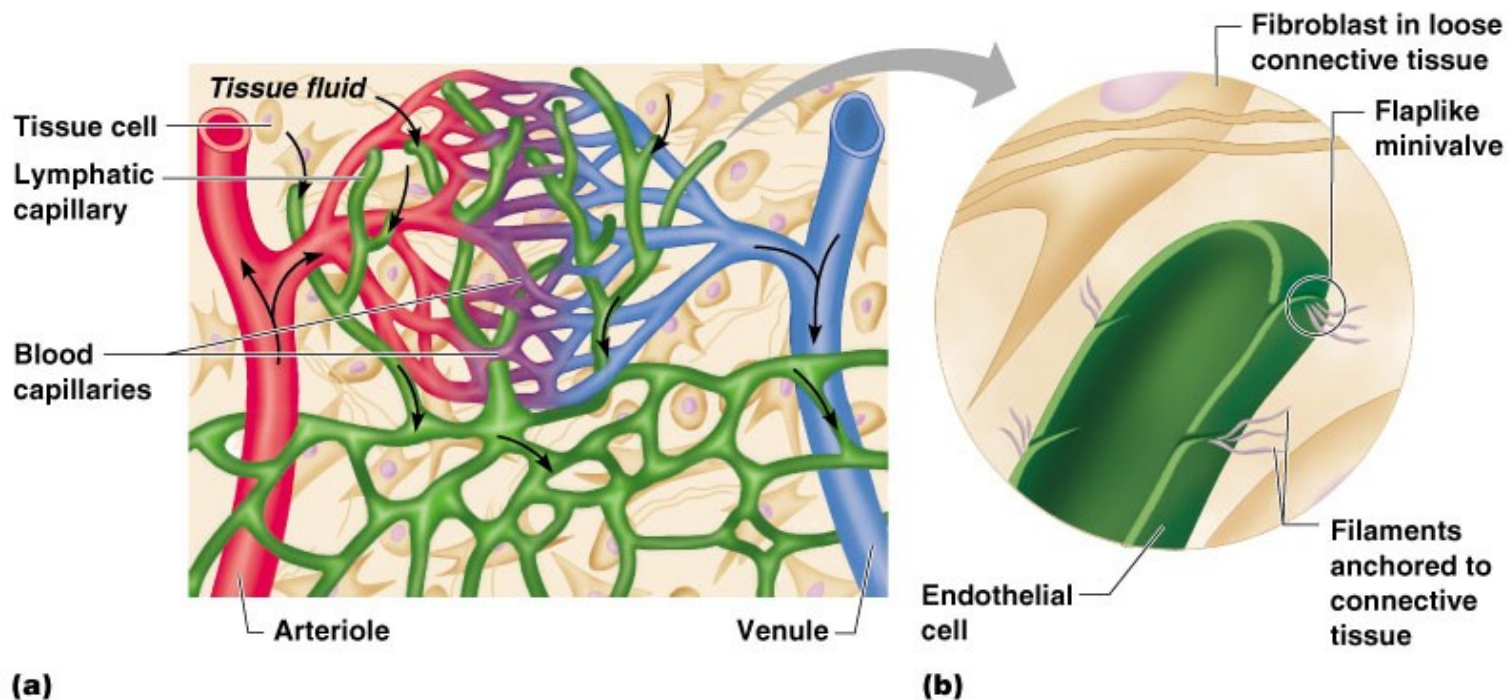


Lymphatic Characteristics

- Lymph – excess tissue fluid carried by lymphatic vessels
- It's a passive system:
 - One way system toward the heart
 - No pump
 - Lymph moves toward the heart
 - Milking action of skeletal muscle
 - Rhythmic contraction of smooth muscle in vessel walls
 - Gravity effects movement

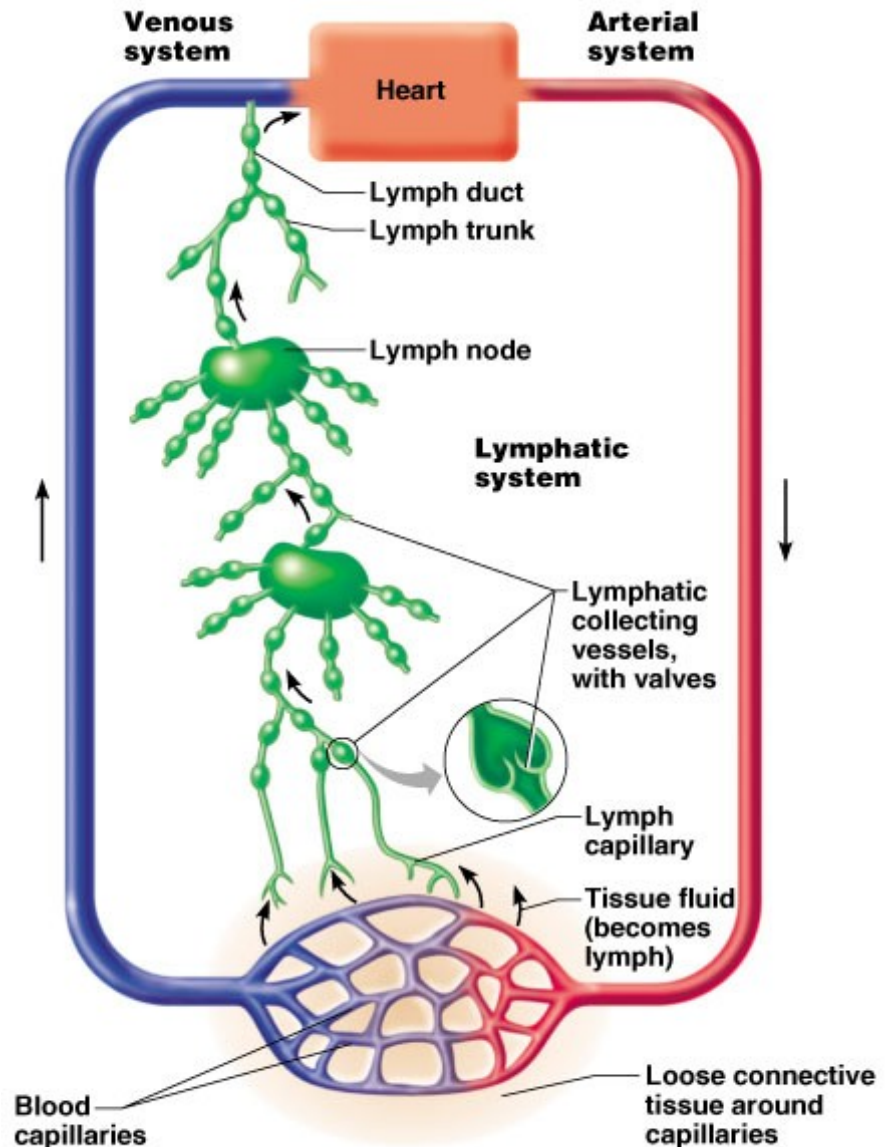
Lymphatic Capillaries

- Fluid leaks through mini-valves into lymph capillaries
- Higher pressure on the inside closes mini-valves



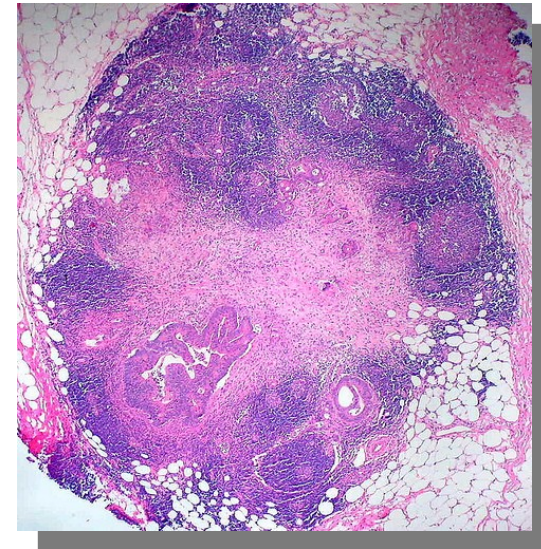
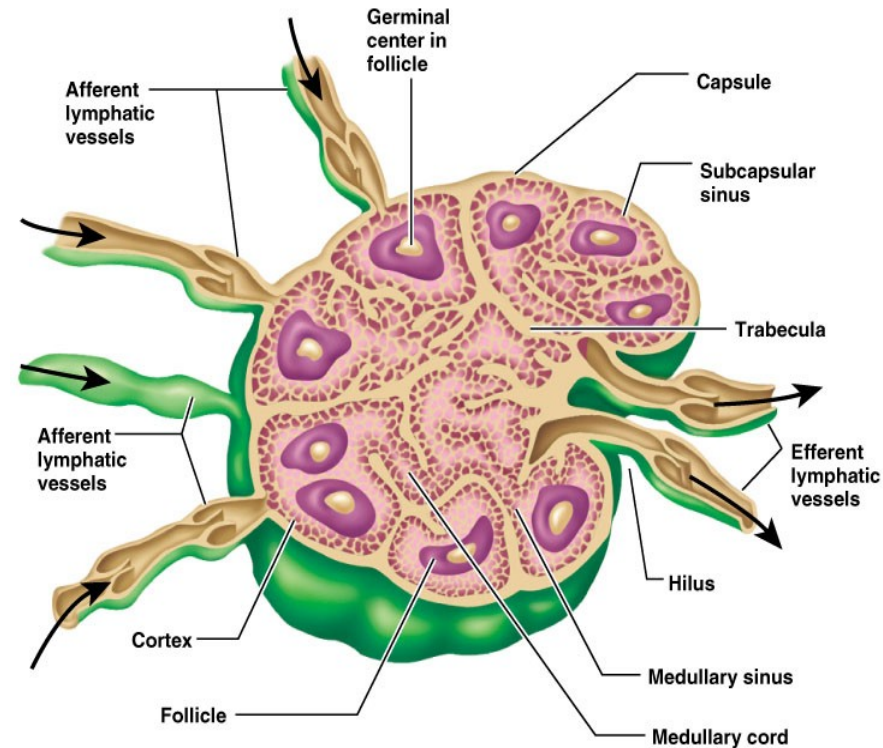
Lymphatic Vessels

- Collects lymph from lymph capillaries
- Delivers lymph to lymph nodes
- Returns fluid to circulatory veins near the heart
 - Right lymphatic duct
 - Thoracic duct



Lymph Nodes

- Filter lymph before it is returned to the blood
- Defense cells in nodes:
 - Medulla houses **macrophages** which engulf and destroy foreign substances
 - Cortex nurtures **lymphocytes** which provide immune response to antigens (cortex)



Flow of Lymph Through Nodes

- Lymph enters the convex side through afferent lymphatic vessels
- Lymph flows through a number of sinuses inside the node
- Lymph exits through efferent lymphatic vessels
- Fewer efferent than afferent vessels causes flow to be slowed

Lymphoid Organs

- Several other organs contribute to lymphatic function
 - Spleen
 - Thymus
 - Tonsils
 - Peyer's patches

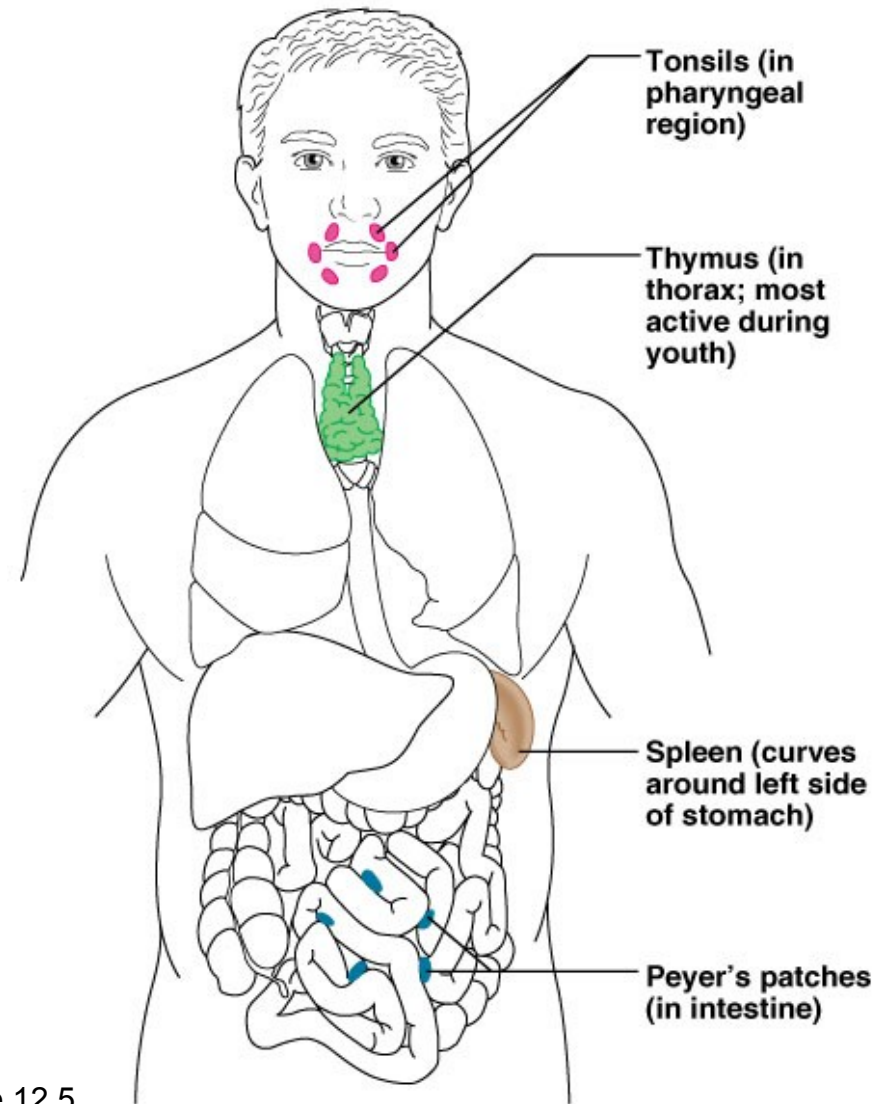
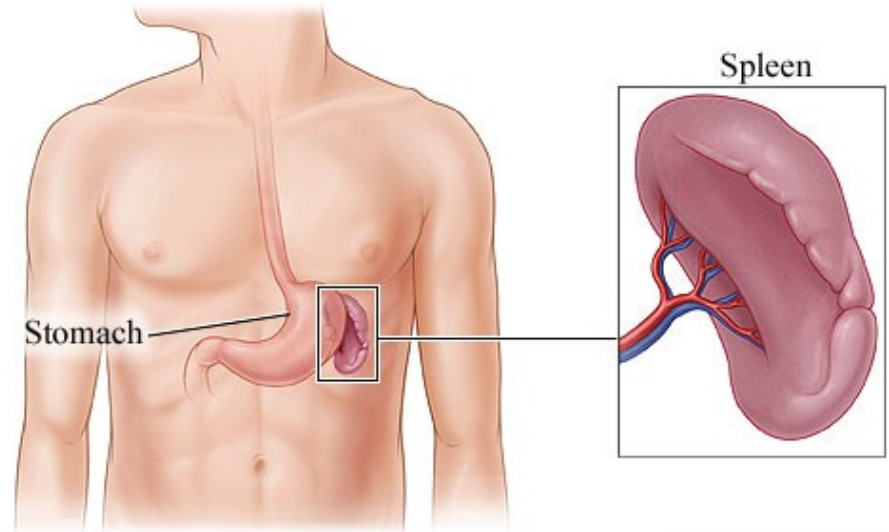


Figure 12.5

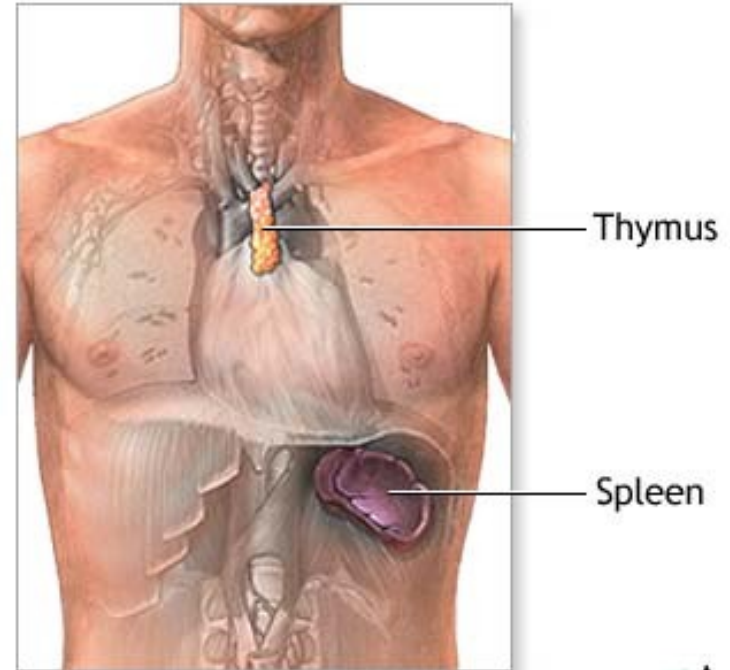
The Spleen

- Filters blood
- Destroys worn out blood cells
- Forms blood cells in the fetus
- Acts as a blood reservoir

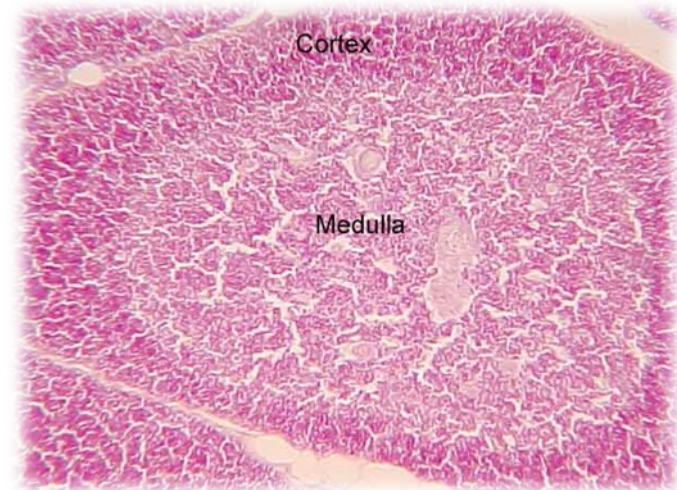


The Thymus

- Functions at peak levels only during childhood
- Produces hormones (like thymosin) to program lymphocytes

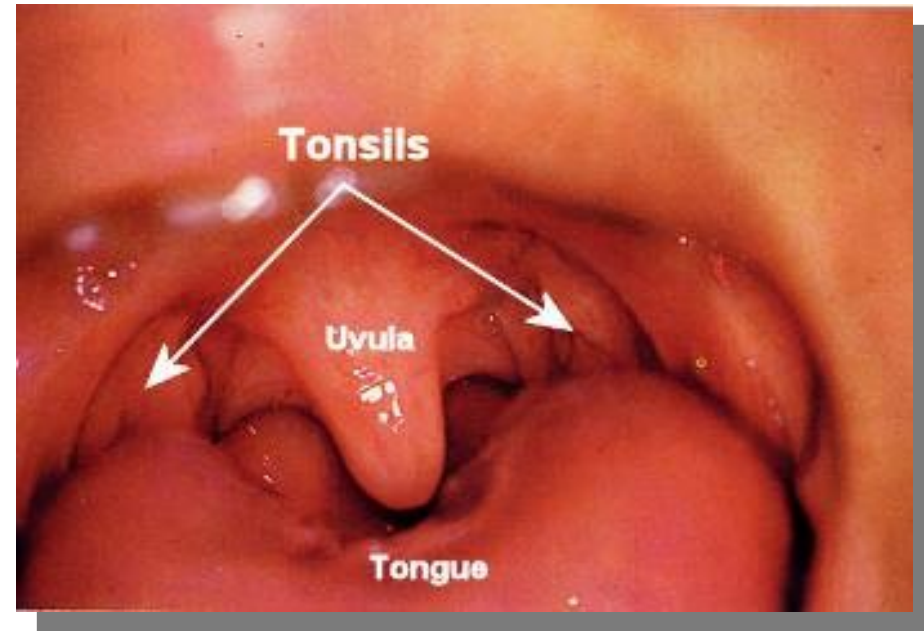


ADAM.



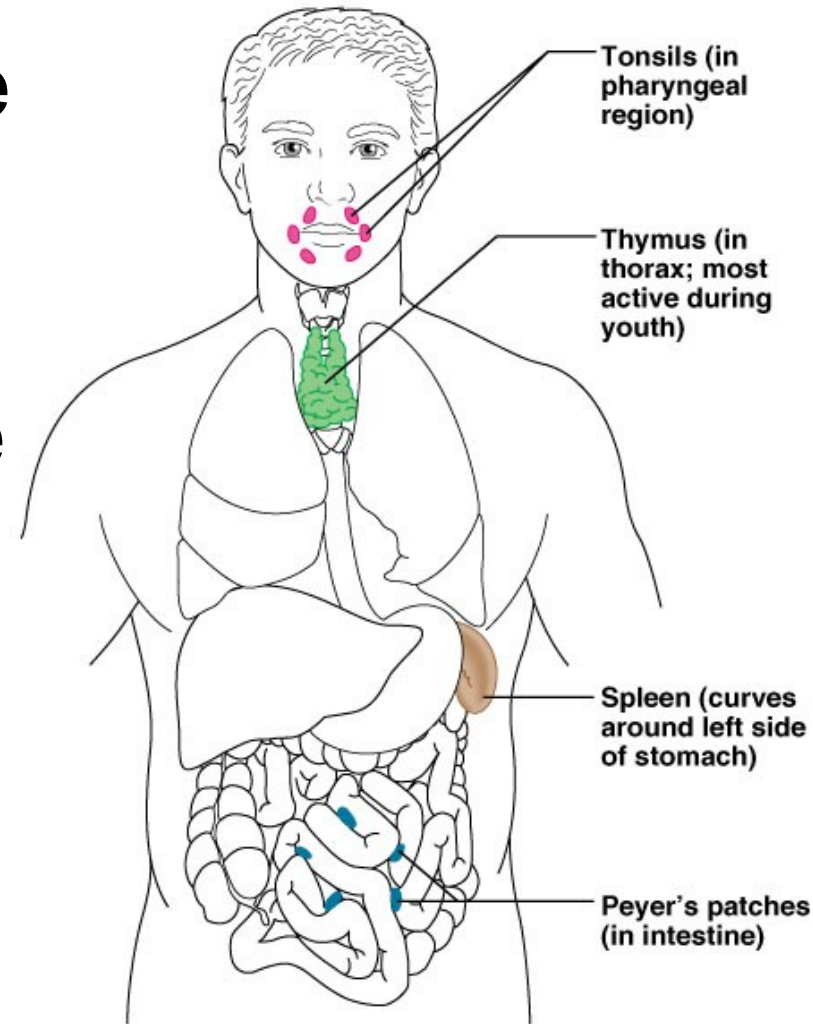
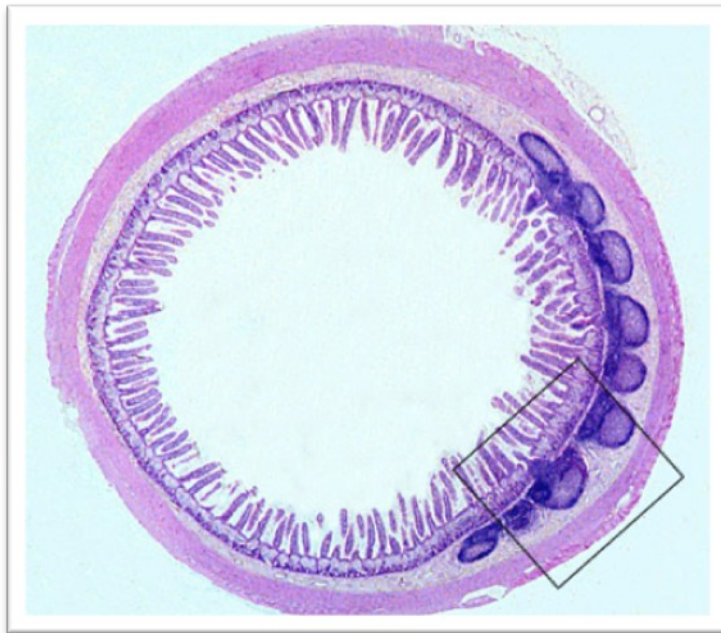
Tonsils

- Small 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 “Tonsils of the intestine”

- Found in the wall of the small intestine
- Capture and destroy bacteria in the intestine



Mucosa-Associated Lymphatic Tissue (MALT)

- Includes:
 - Peyer's patches
 - Tonsils
 - Other small accumulations of lymphoid tissue
- Acts as a sentinel to protect respiratory and digestive tracts