

# Lymphatic System

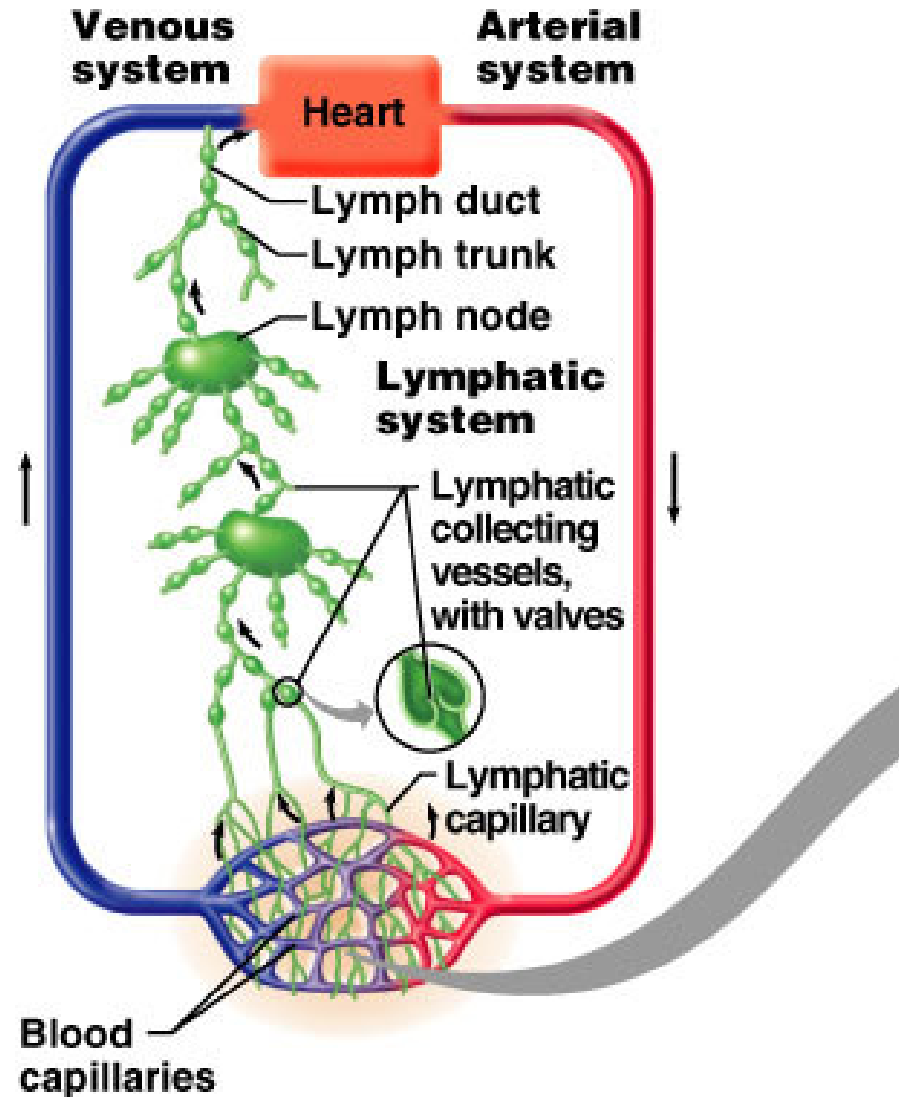
- **Lymphatic System**

- **Made up of:**

- **Lymph**
    - **Lymph vessels**
    - **Lymphocytes**
    - **Lymph nodules**
    - **Lymph nodes**
    - **Tonsils**
    - **Spleen**
    - **Thymus Gland**
    - **Red Bone Marrow**

- **Functions**

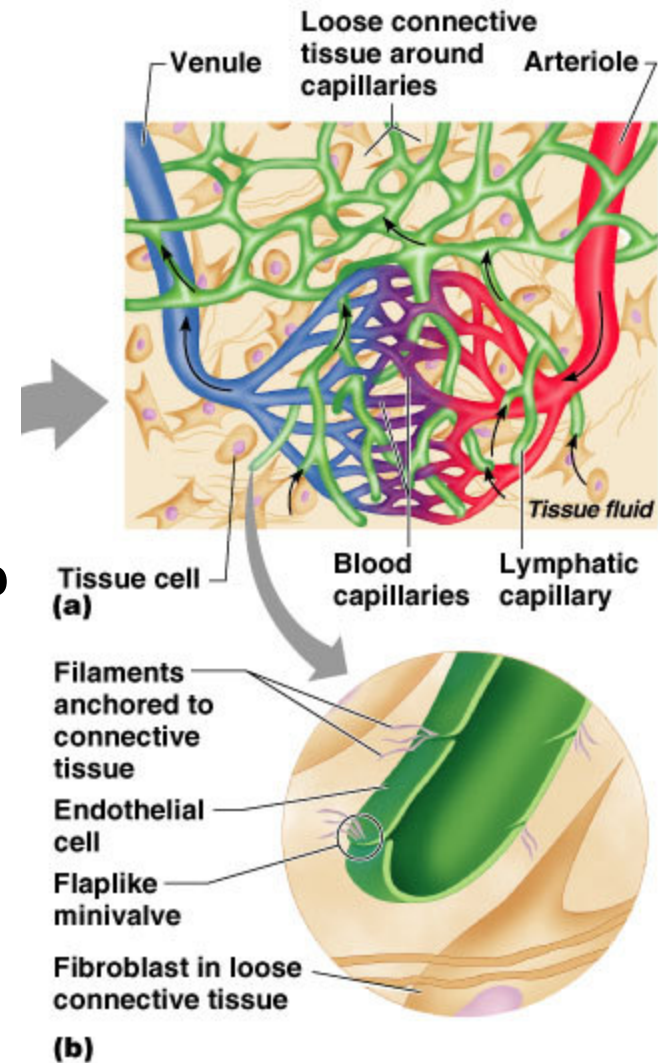
- **Maintains fluid balance in tissues**
    - **Absorbs fats from the small intestine**
    - **Defends against microorganisms and foreign substances**



# Lymphatic System

- **Lymph Capillaries**

- **Lack a basement membrane**
- **Epithelial cells loosely overlap**
- **Lymph Transport**





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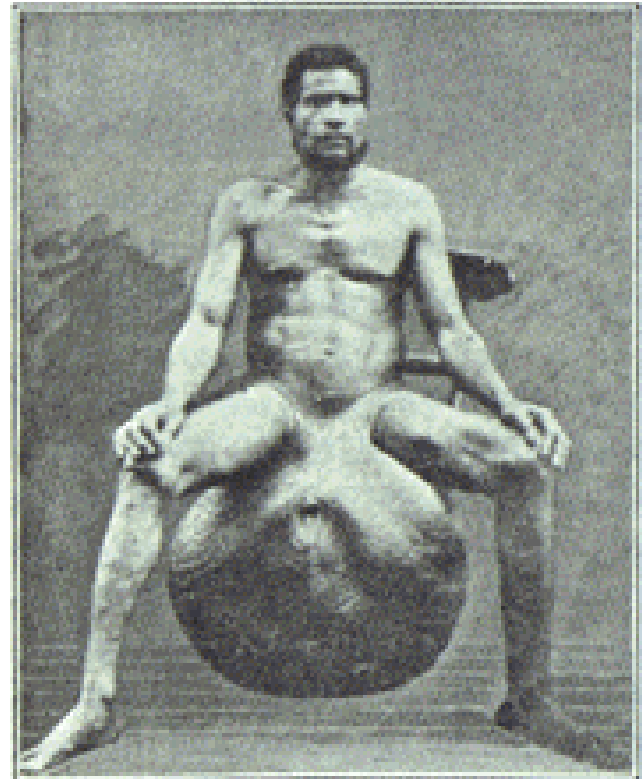
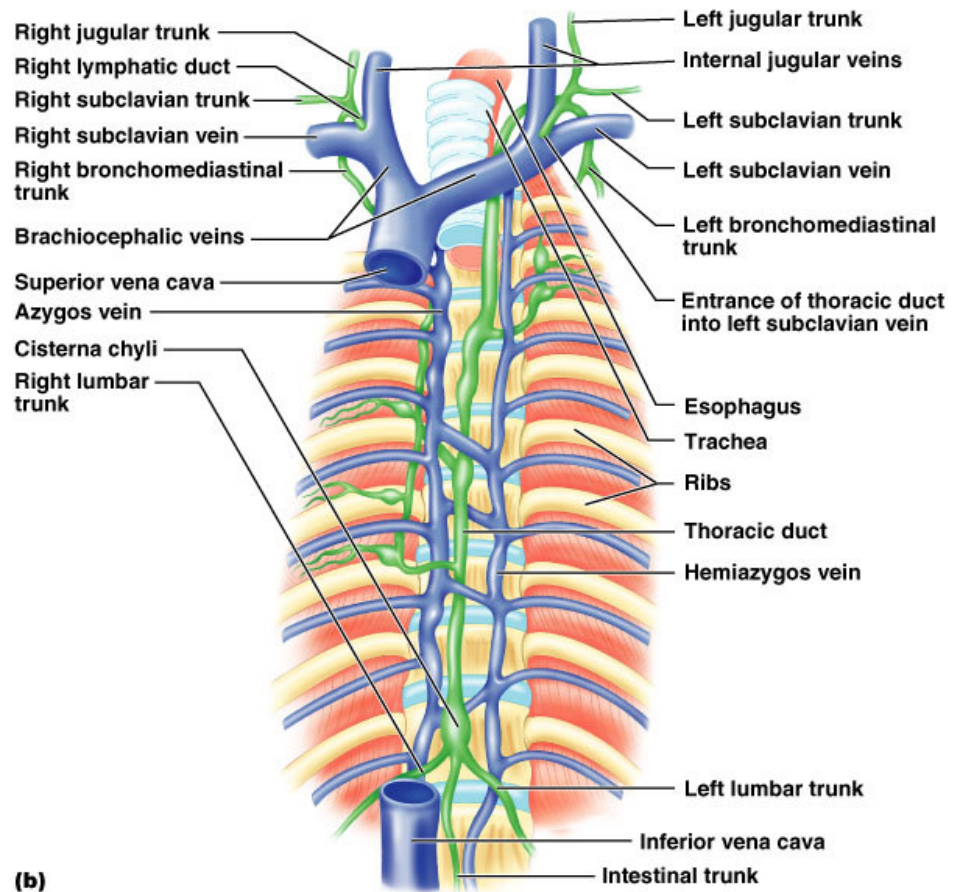
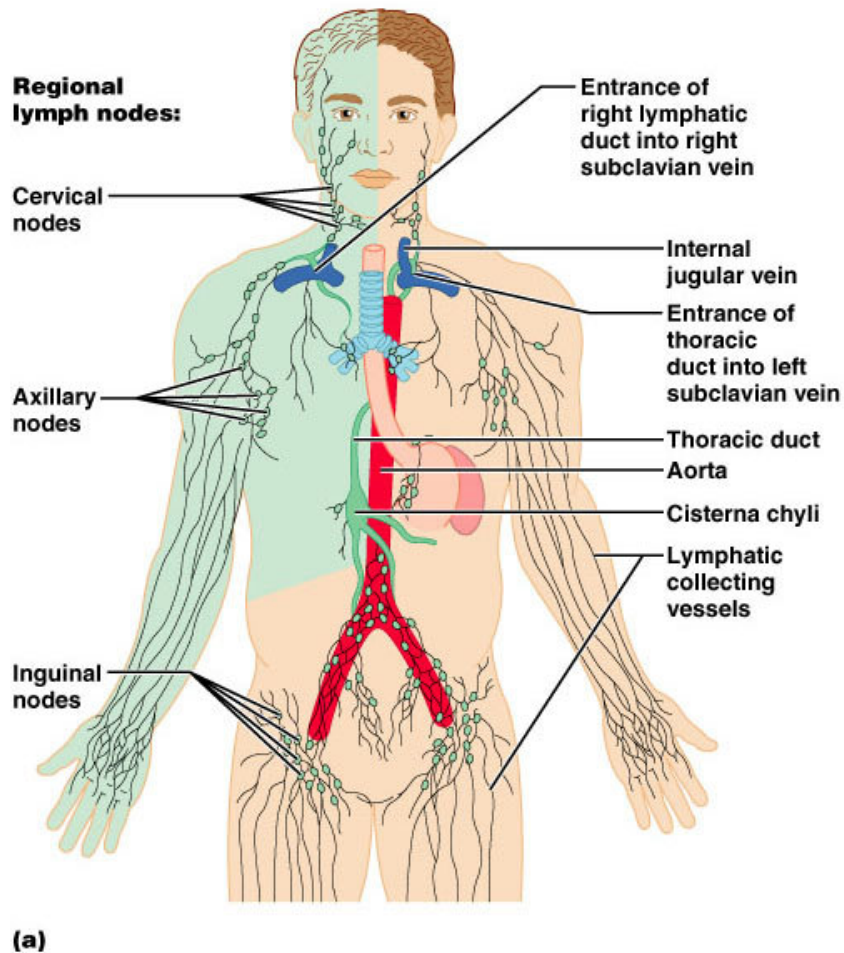


Fig. 281.—Elephantiasis of the scrotum in a native of FIJI



# Lymphatic System

## • Lymph Trunks and Ducts



# Lymphatic System

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- **Lymphoid Cells**

- **Lymphocytes**

- **“Main Warriors”**

- **Produced where?**

- **Protect against antigens**

- **Two major types**

- **T Cells**

- » **Orchestrate the immune response**

- » **Some are direct killers that destroy foreign antigens**

- **B Cells**

- » **Produce plasma cells that in turn produce antibodies**

# **Lymphatic System**

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## **– Lymphoid Macrophages**

- **Eat and destroy foreign antigens**
- **Play a role in activating T Cells**

## **– Dendritic Cells**

- **Function like macrophages**
- **Appear spiny**
- **Found in lymphoid tissues**

## **– Reticular Cells**

- **Produce the fibrous stroma located in lymphoid organs**

# Lymphatic System

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- **Lymphoid Tissues**
  - **Houses lymphocytes**
  - **Provides a “check point” for lymphocytes and macrophages to work**
  - **Composed of several types**
    - **Reticular CT**
      - **Found in all lymphoid organs except the thymus gland**
        - » **Macrophages live on the fibers**
        - » **Lymphocytes live in the spaces between the fibers**

# Lymphatic System

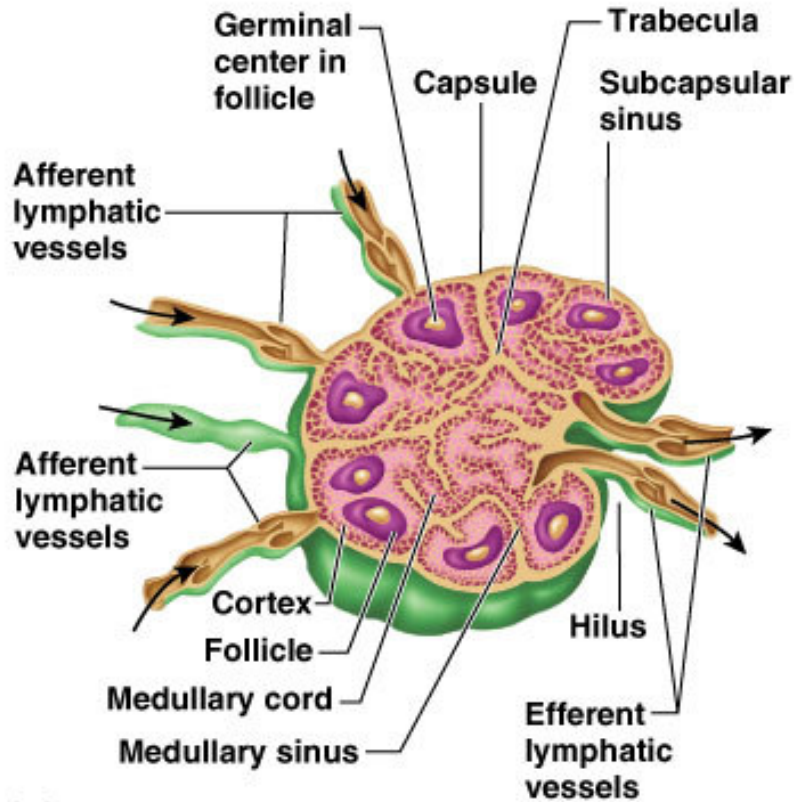
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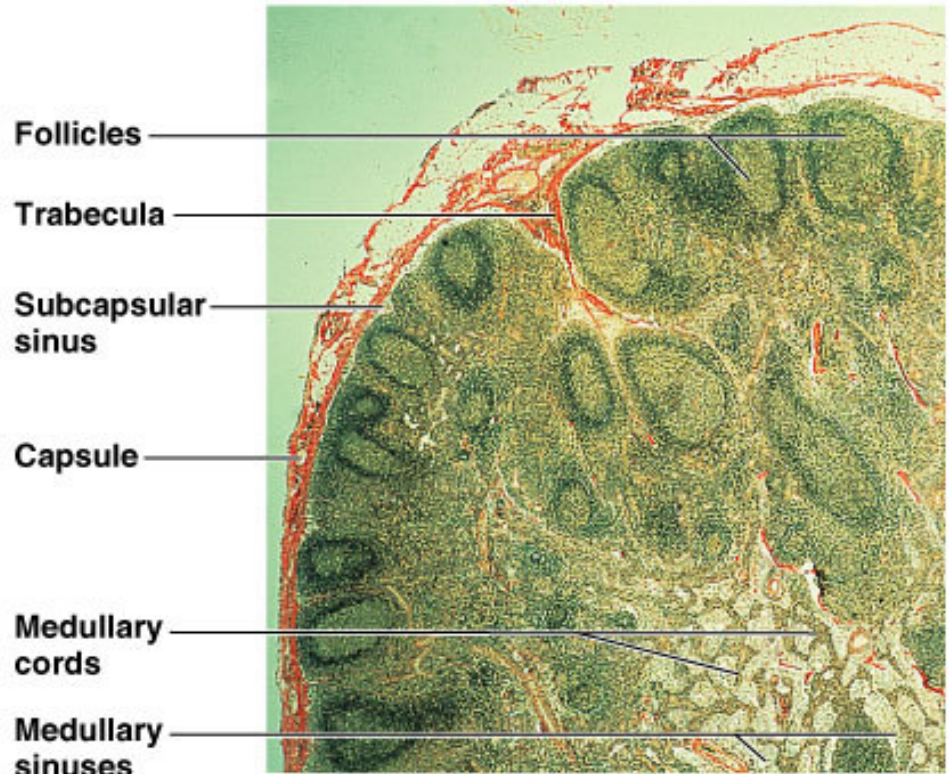
- **Diffuse Lymphatic Tissue**
  - **Scattered reticular tissue elements found in virtually all body organs**
  - **Larger numbers are found in mucous membranes**
- **Lymphoid Follicles (nodules)**
  - **Lack a capsule**
  - **Solid, spherical structures, with tightly packed reticular elements**
  - **Often have light centers (germinal centers) that contain dendritic cells and B Cells**
  - **Good example, Peyer's patches in the intestines and appendix**

# Lymphatic System

- **Lymph Nodes**



(a)



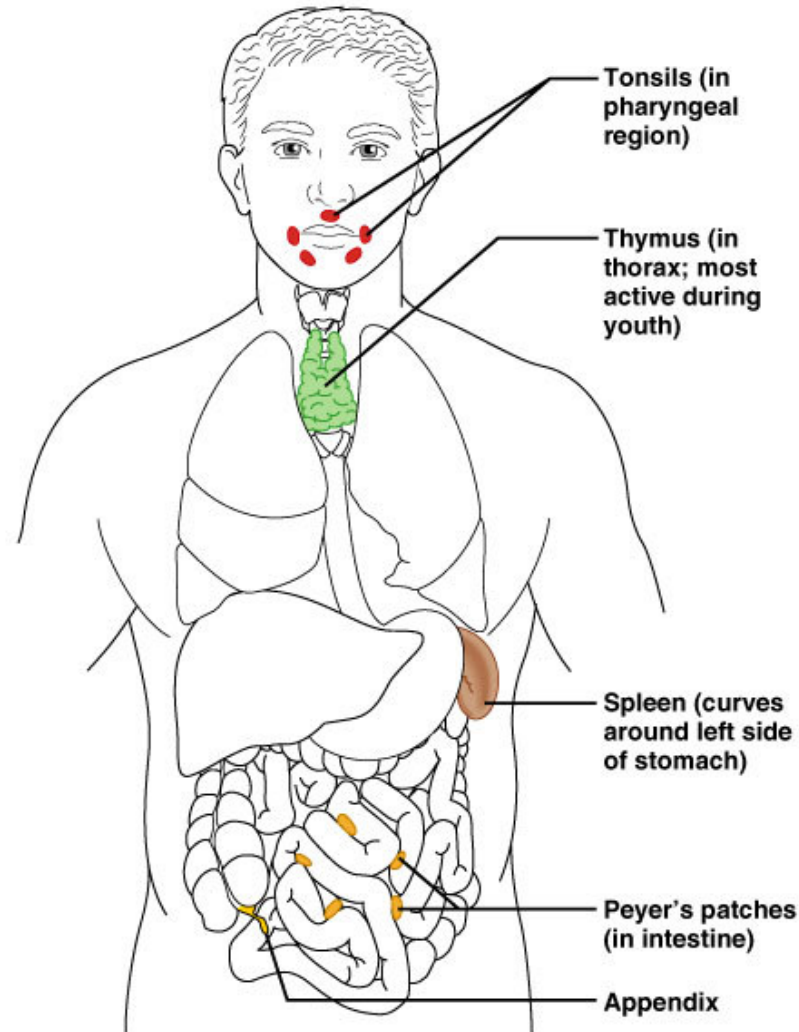
(b)

# Lymphatic System

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- **Other Lymph Organs**



# Lymphatic System

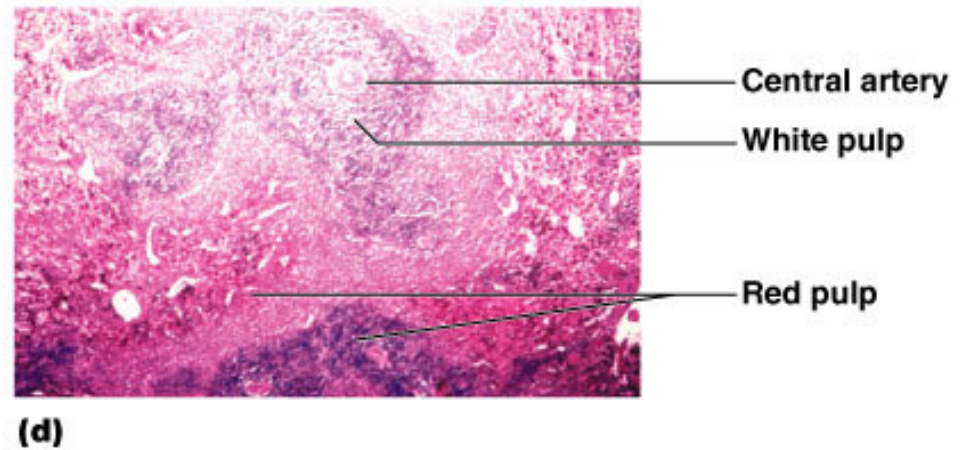
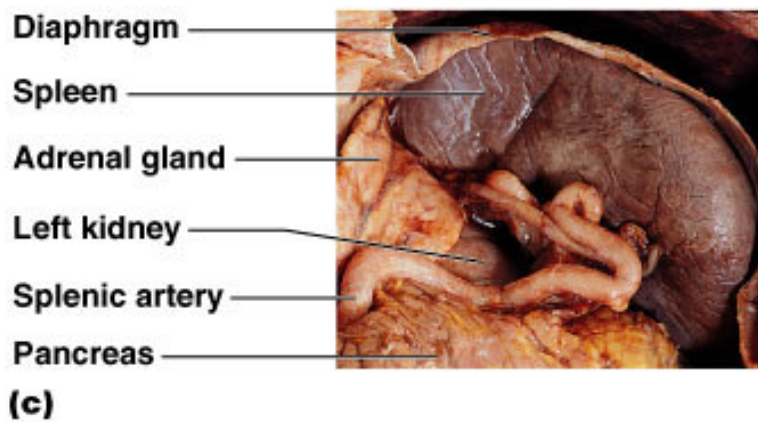
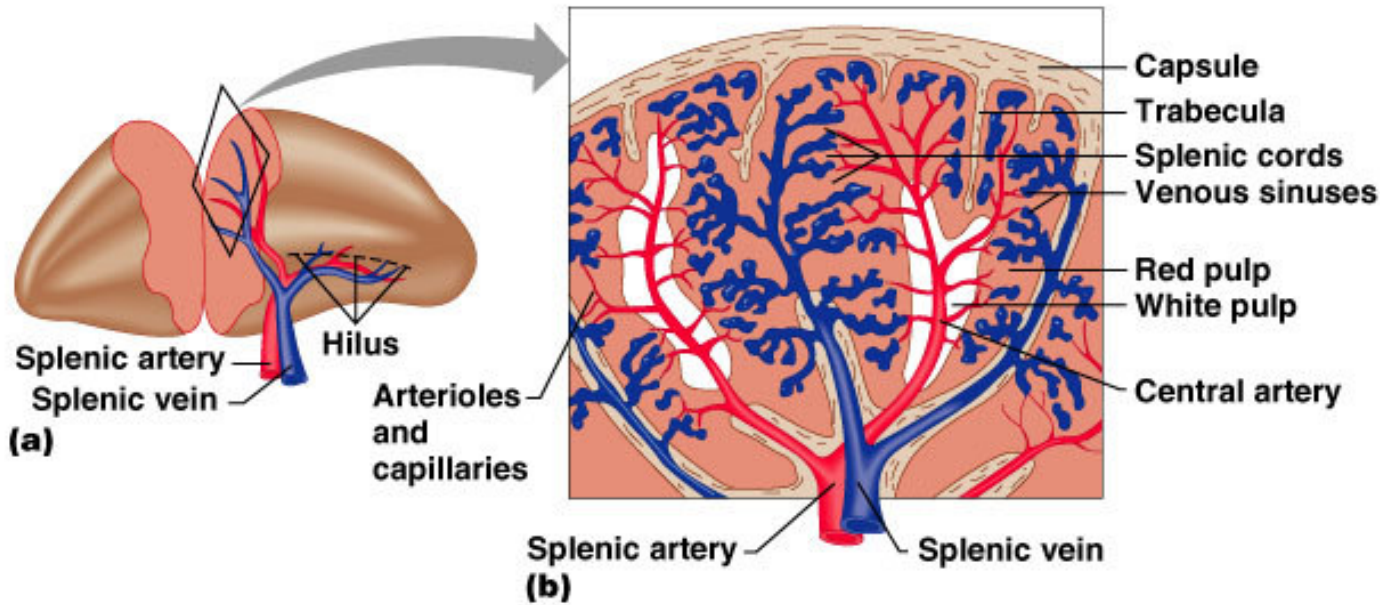
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## - Spleen

- **Site for lymphocytes to proliferate and do their job of surveillance**
- **Cleans the blood (much like lymph nodes clean lymph) - removes old RBC's and platelets**
- **Aids in recycling RBC components**
- **Site of erythropoiesis in the fetus**
- **Stores blood and platelets**

# Lymphatic System



# **Lymphatic System**

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- **Thymus Gland – important in early life**
  - **Secretes two hormones that play an important role in T lymphocytes becoming immunocompetent**
- **Tonsils – named according to location**
  - **Palatine – paired, on either side of the soft palate**
  - **Lingual – paired at the base of the tongue**
  - **Pharyngeal – located in the posterior portion of the nasopharynx**

# **Lymphatic System**

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- **Aggregates of Lymphoid Follicles**
  - **Protect both the respiratory and digestive tracts**
  - **Part of a collection of lymphoid tissues called mucosa-associated lymphatic tissue; MALT**