



Body Defense

The Lymphatic System

What Composes the Lymphatic System?

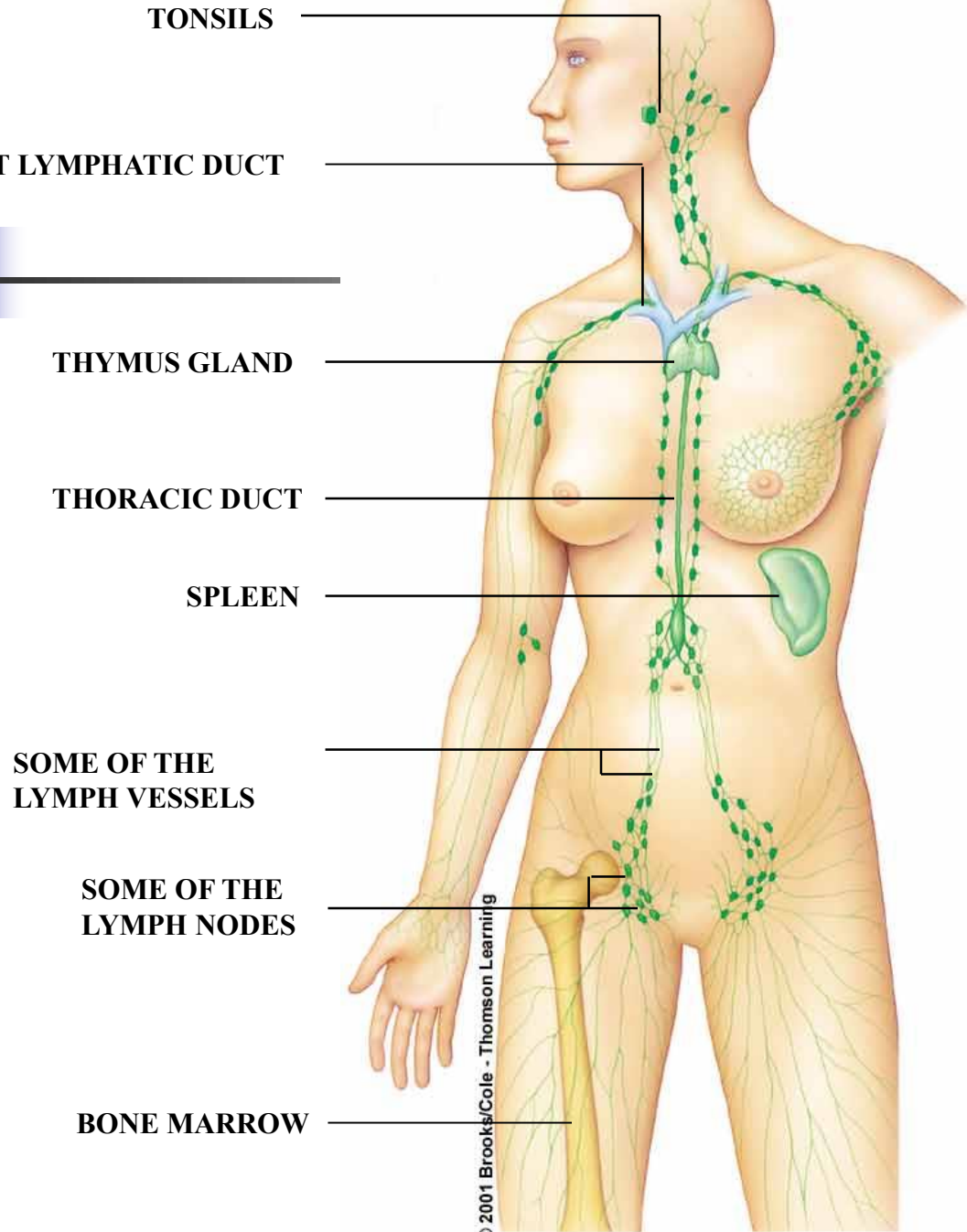
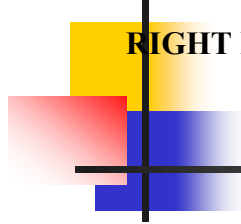




The Lymphatic system is

Composed of...

1. Lymph, a fluid
2. A network of vessels
3. Special cells called lymphocytes
4. A net of special lymphoid tissue & organs



TONSILS

RIGHT LYMPHATIC DUCT

THYMUS GLAND

THORACIC DUCT

SPLEEN

**SOME OF THE
LYMPH VESSELS**

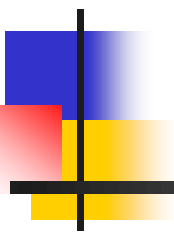
**SOME OF THE
LYMPH NODES**

BONE MARROW

© 2001 Brooks/Cole - Thomson Learning

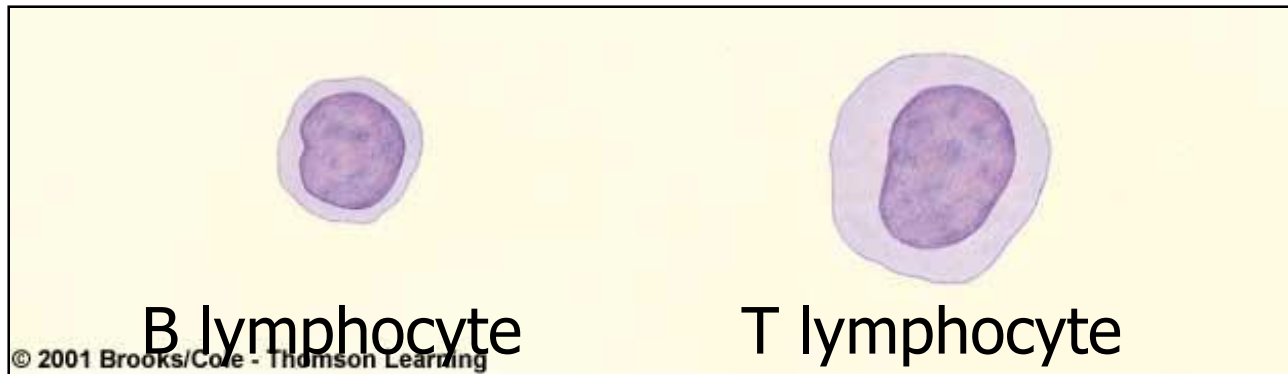
Fig. 39.26, p. 685

What is the primary cell of the lymphatic system?



The Lymphocyte; they respond to...

1. invading bacteria & viruses
2. Abnormal cells
3. Foreign proteins (toxins)



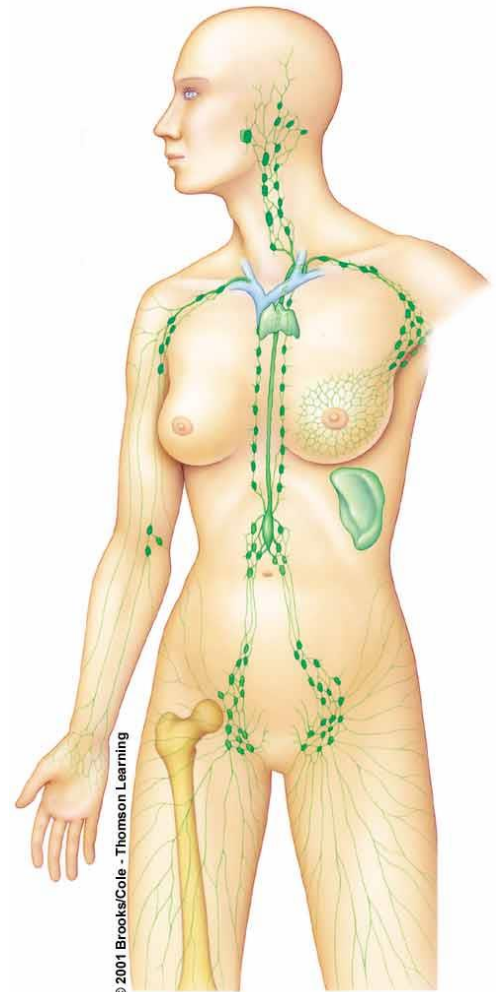


3 Main Functions...

1. Drainage channel for water and plasma proteins that have leaked from capillaries – send them back to the blood
2. Takes up fats digested from the intestines – send to the blood
3. Sends pathogens to lymph nodes

Starts at capillary beds

- Lymph capillaries have flap-like, one-way valves
- The capillaries become lymph vessels
- These vessels converge and drain into the veins in the lower neck



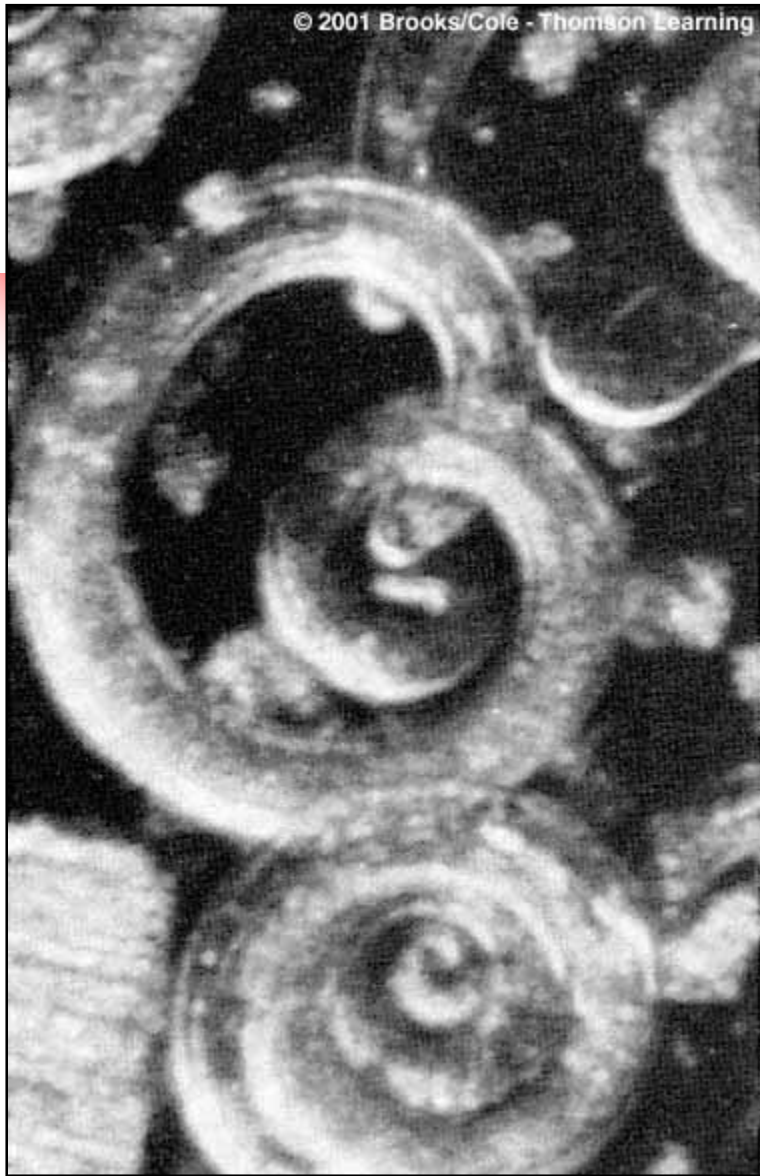


Fig. 26.21, p. 435

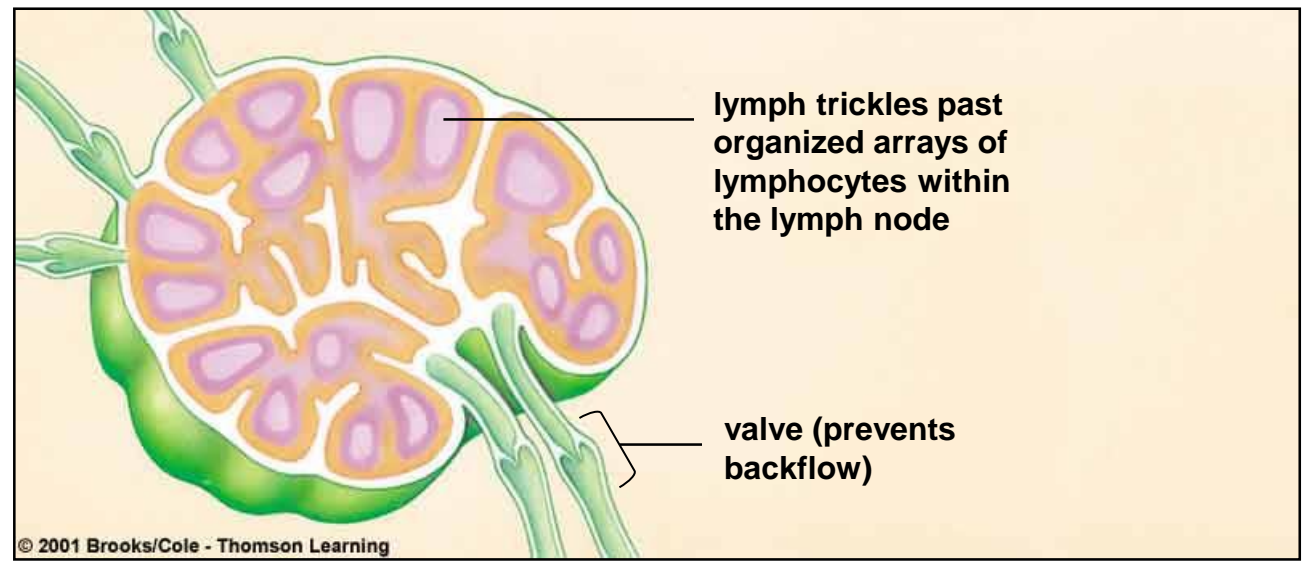
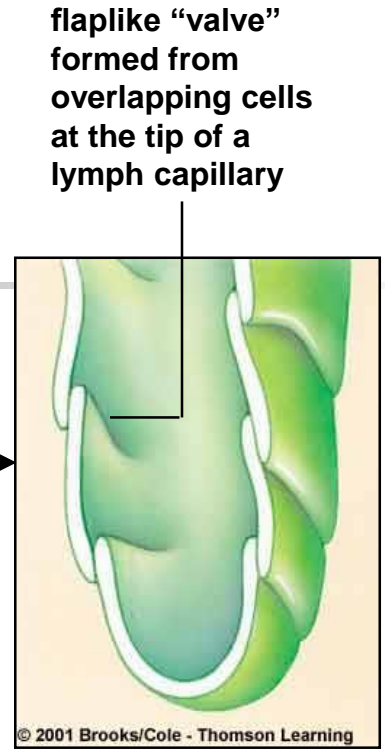
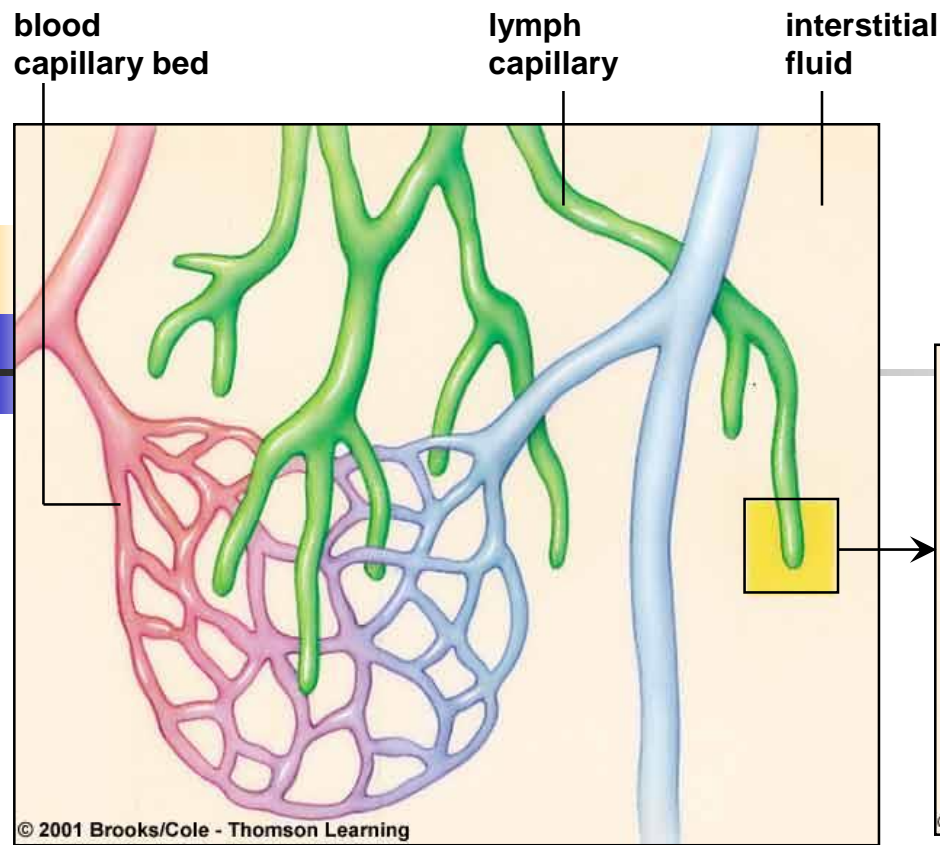
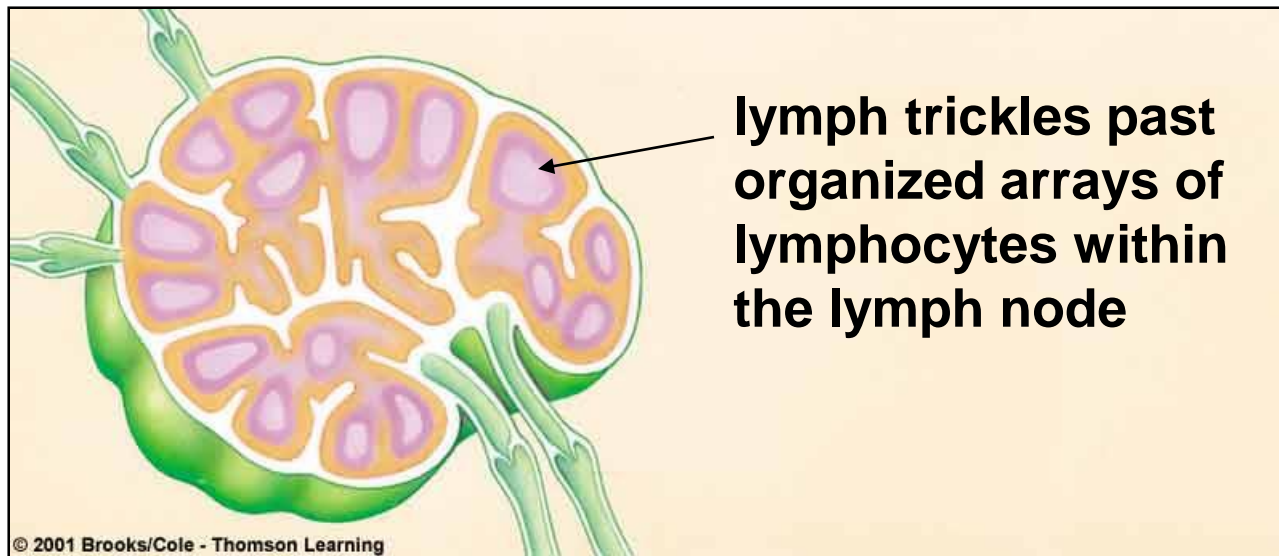


Fig. 39.25, p. 684

Lymphoid Organs & Tissues

- Lymph nodes: Little chambers located at intervals along lymph vessels





Lymphoid Organs & Tissues

- The spleen: the largest lymphoid organ. It filters pathogens & used-up blood cells from the blood.
- Has two parts; the red pulp (stores rbc's) and the white pulp (masses of lymphocytes)



Lymphoid Organs & Tissues

- The Thymus Gland: produces hormones that allow young lymphocytes to change to recognize and attack specific pathogens



Types of Lymphocytes

1. T cells (from the thymus)
2. B cells (from the bone marrow)
3. NK (natural killer cells)



T Cells...a lot of different types

1. Cytotoxic T cells: attack foreign cells or virus infected cells
2. Helper T cells: activate other T and B cells
3. Suppressor T cells: shut down other T and B cells
4. And many others (80% of lymphocytes)



B Cells

- 10-15% of lymphocytes
- B cells can become plasma cells; these make antibodies (proteins that attack pathogens)



NK Cells

- 5-10% of lymphocytes
- They attack foreign cells, normal cells invaded w/ viruses, and cancer cells
- They constantly patrol in a process called **immunological surveillance**.