

The Lymphatic System

1. Overview
 1. lymphatic vessels
 1. (figure)
 1. lacteals in intestinal mucosa
 1. creamy chyle contains fats, hence white = lacteals
 2. lymphatic tissues & organs
 1. figure
 2. Problem: interstitial fluid
 1. hydrostatic pressure
 1. pushes blood out of capillaries
 2. osmotic pressure helps reabsorption in veins
 3. lymphatic vessels collect interstitial fluid and return it to circulation
 3. Problem: reabsorption
 1. One-way system
 1. endothelial cells are:
 1. loosely joined, overlap, forming minivalves
 2. anchored: increasing volume separates rather than collapses lymph capillaries
 2. lymph capillaries can open even wider during inflammation
 3. figure
4. Problem: filtering through lymph nodes
 1. cleansing
 1. cell debris
 2. examination by immune system
 1. pathogens
 2. cancer cells
5. lymphatic collecting vessels, trunks, ducts
 1. initially they parallel veins, later they parallel arteries
 2. many anastomoses
6. Transport
 1. vein-like
 1. no pump, rely on muscles & activity
 2. one-way valves
 2. pathology
 1. can be blocked by filarial nematode infections, which lead to elephantiasis
7. Lymphoid Cells, Tissues & Organs
 1. Lymphoid Cells
 1. lymphocytes
 1. B cells- produce plasma cells, secrete antibodies
 2. T cells- manage & direct immune response
 2. macrophages
 3. dendritic & reticular cells
 2. Lymphoid Tissue
 1. reticular connective tissue
 1. housing & proliferation sites for lymphocytes
 2. surveillance point
 3. Lymphoid Organs
 1. Lymph Nodes
 1. one way flow
 2. buboes- swell w/ pain
 3. cancerous- swell w/o pain
 2. Spleen
 1. salvage & store breakdown products of RBC's
 2. fetal RBC production
 3. blood platelet storage
 4. white pulp
 1. fibers with lymphocytes
 2. filtering
 5. red pulp
 1. macrophages
 2. immune monitoring
 3. Thymus
 1. thymosin & thymopoetin
 2. T cells become immunocompetent
 3. active in young
 4. Tonsils
 1. crypts trap & help create immunologic memory
 5. Peyer's patches
 1. "tonsils" in ileum
 2. lymphoid nodules in appendix
 3. function:
 1. destroy bacteria
 2. generate memory lymphocytes
 6. Mucosa-associated lymphatic tissue (MALT)
 1. Peyer's patches
 2. appendix
 3. tonsils
 4. lymphoid nodules in bronchi
 5. figure