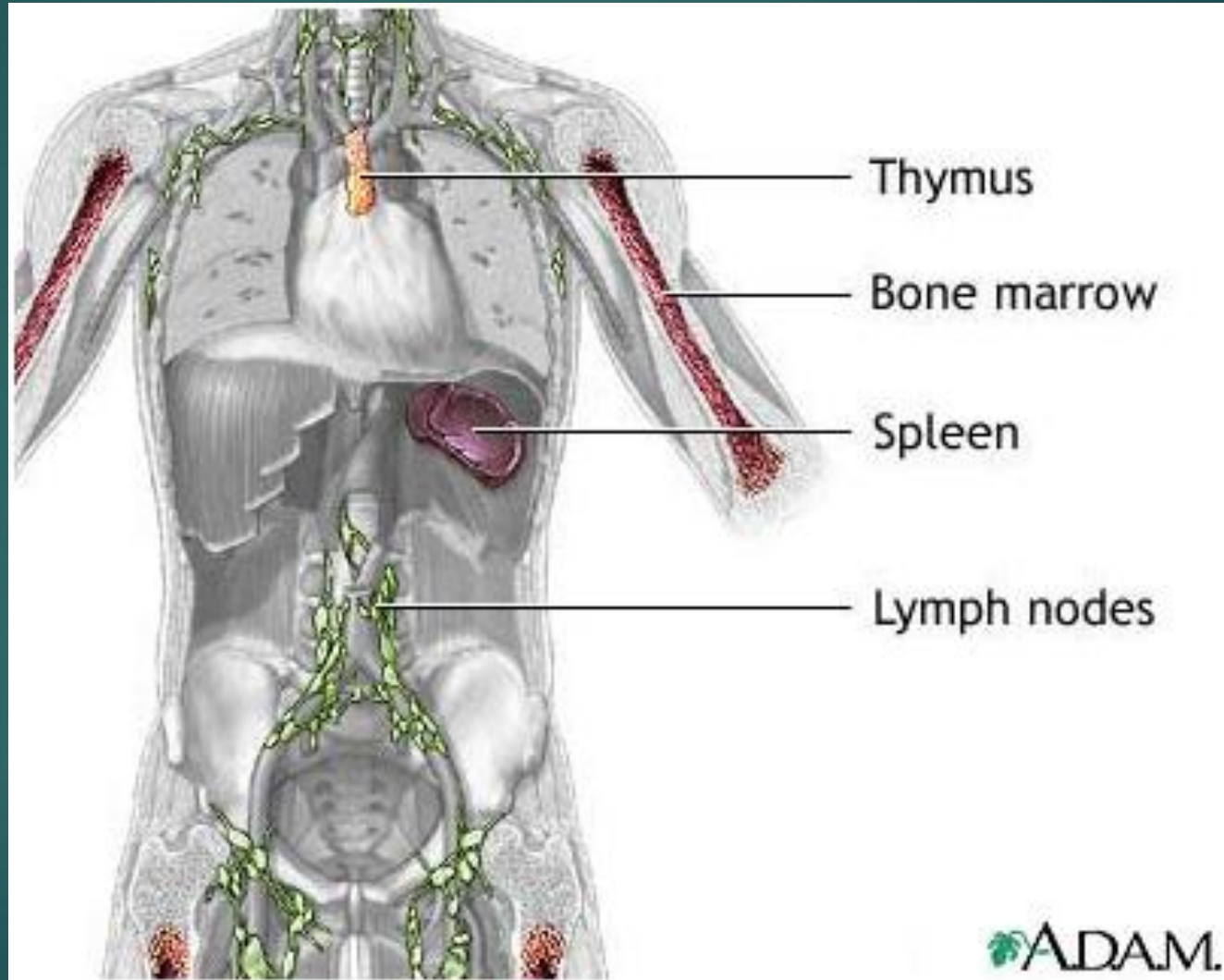


Anatomy of Immune System

Dr. Ahmed Hasan

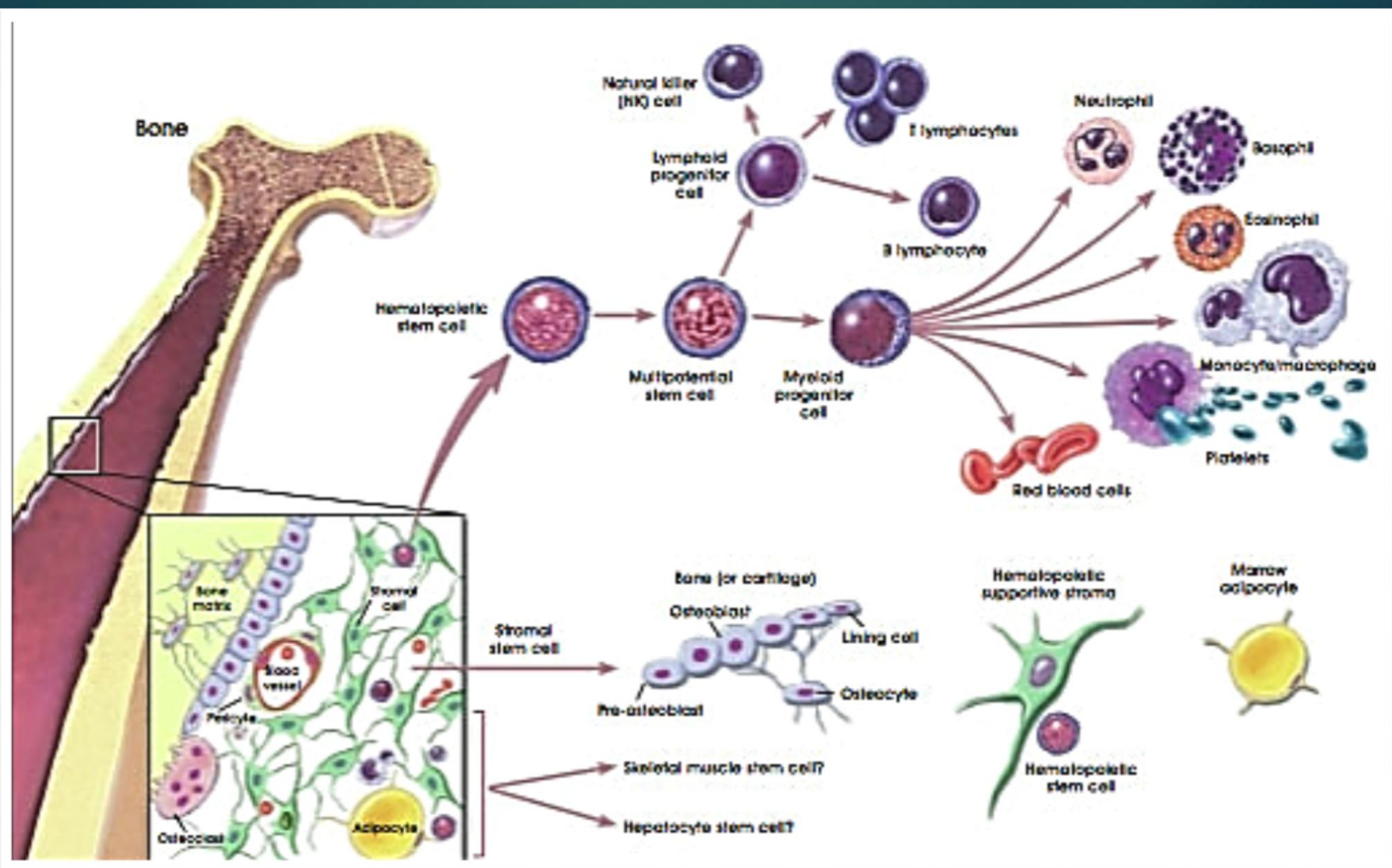
Introduction

- ▶ The immune system operates throughout the body. There are, however, certain sites where the cells of the immune system are organized into specific structures. These are classified as central lymphoid tissue (bone marrow and thymus) and peripheral lymphoid tissue (lymph nodes, spleen and mucosa-associated lymphoid tissue).



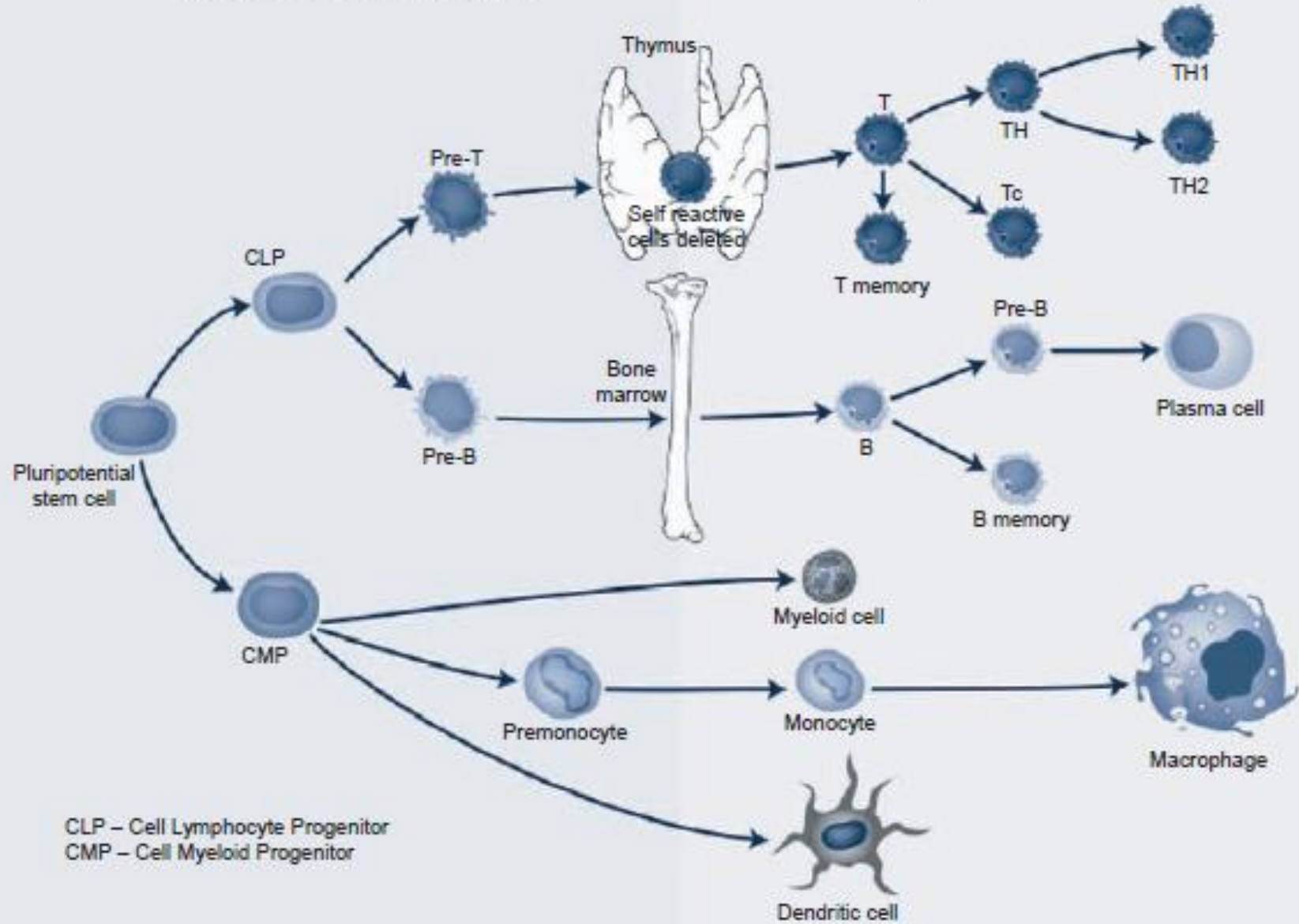
Bone marrow

- ▶ All the cells of the immune system are derived from stem cells in the bone marrow. The bone marrow is the site of origin of red blood cells, white cells (including lymphocytes and macrophages) and platelets.



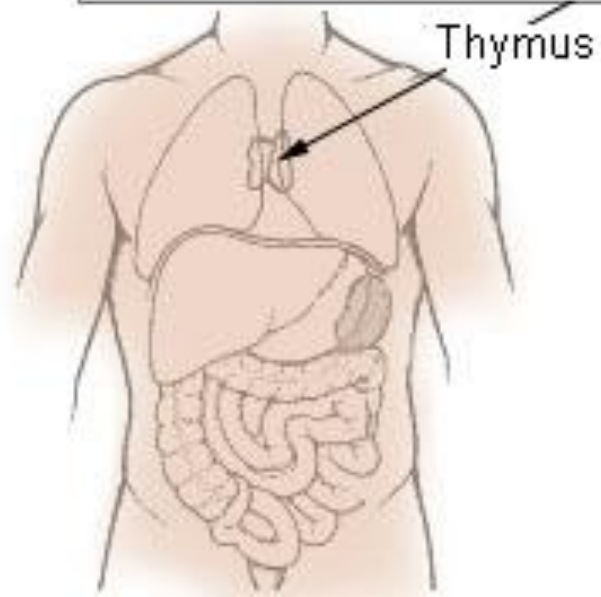
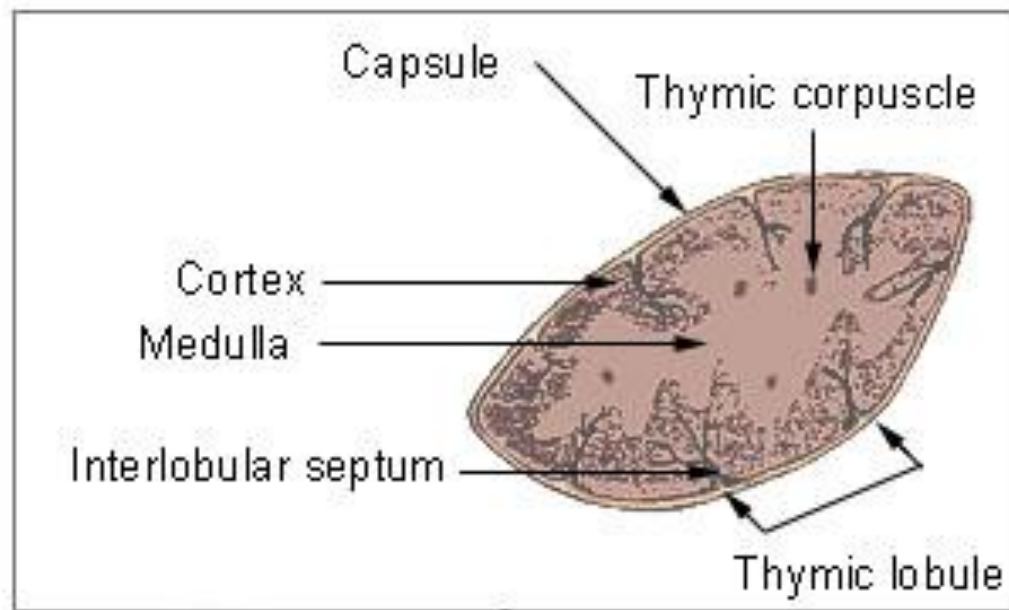
Lymphocyte Development

Peripheral Effector Cells



Thymus

- ▶ In the thymus gland lymphoid cells undergo a process of maturation and education prior to release into the circulation. This process allows T cells to develop the important attribute known as self tolerance.
- ▶ The thymus gland is arranged into an outer, more cellular, cortex and an inner, less cellular, medulla. Immature lymphoid cells enter the cortex proliferate, mature and pass on to the medulla. From the medulla mature T lymphocytes enter the circulation

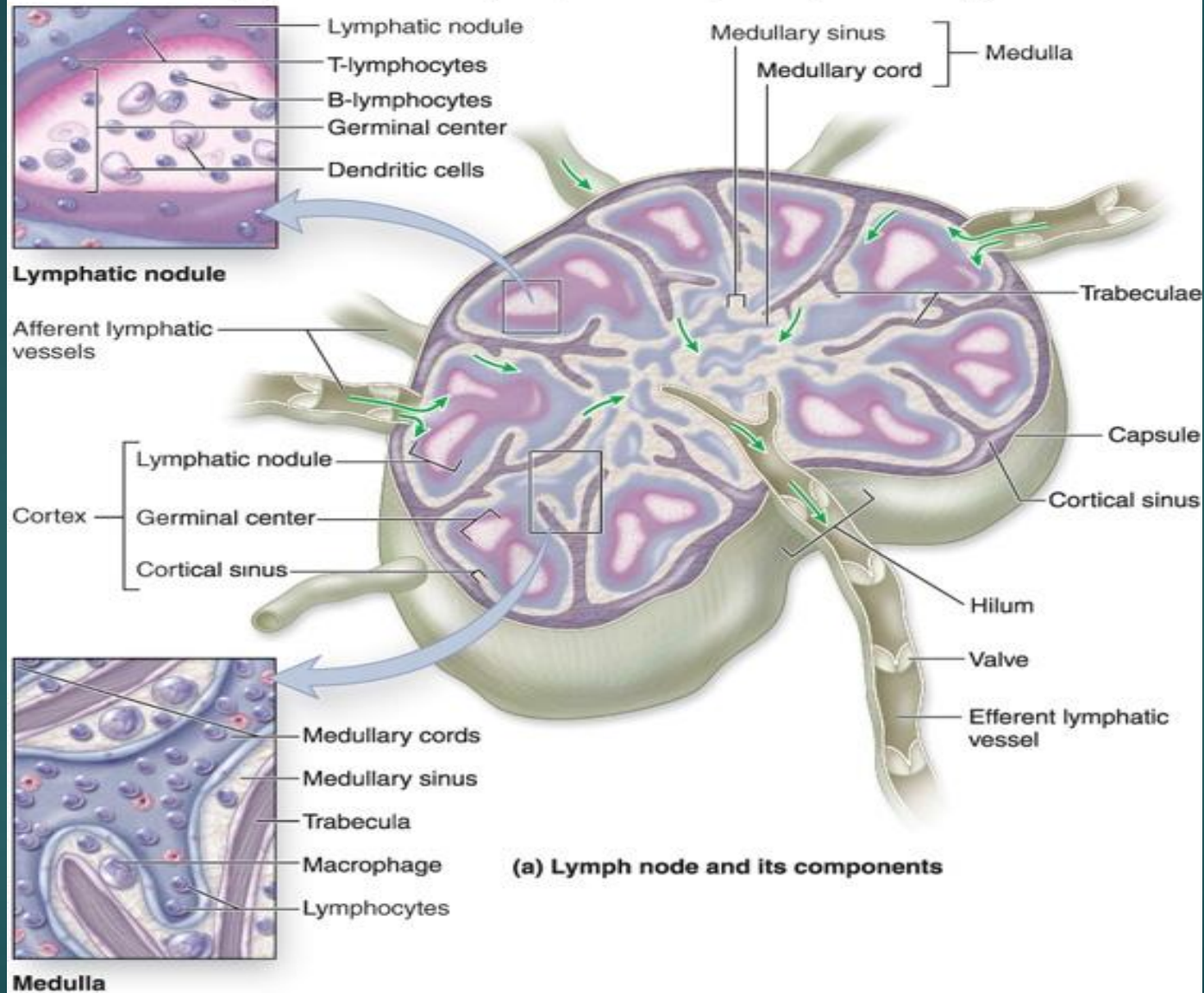


Thymus

Lymph nodes

- ▶ Lymph nodes are small bean shaped structures lying along the course of lymphatics. They are aggregated in particular sites such as the neck, axillae, groins and para-aortic region. Knowledge of the sites of lymph nodes is important in physical examination of patients.
Lymph nodes have two main functions
 1. phagocytic cells act as filters for particulate matter and micro-organisms
 2. antigen is presented to the immune system
- ▶ The node is made up of three components:
 1. lymphatic sinuses
 2. blood vessels
 3. parenchyma (cortex, paracortex, medulla)

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

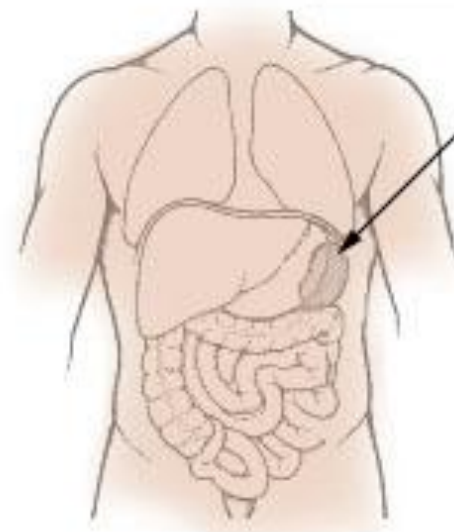
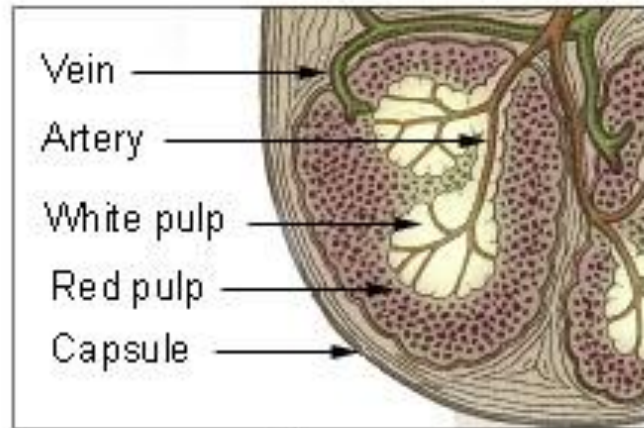


Spleen

- ▶ The spleen is located in the upper left quadrant of the abdomen. It has two main functions acting as part of the immune system and as a filter.
- ▶ The spleen has a thin connective tissue capsule from which short septa extend inwards. These septa are, in turn, connected to a complex reticulin framework.

There are two distinct components of the spleen, the red pulp and the white pulp. The red pulp consists of large numbers of sinuses and sinusoids filled with blood and is responsible for the filtration function of the spleen. The white pulp consists of aggregates of lymphoid tissue and is responsible for the immunological function of the spleen.

Spleen



Spleen