A figure like Figure 21.3 Inflammation: flowchart of events provides an excellent overview of several aspects of the innate immune system which includes what we have learned before (clotting) to other responses to tissue damage.

Table 21.2 provides an awesome summary of innate defenses and should help you keep these straight as well as provide a great reminder of the system while studying for the test. The table generalizes protective mechanisms; the text provides supporting detail.

Understanding antigen-antigen receptor interactions can be difficult. Add to that the fact that the adaptive system typically requires self-antigen recognition at the same time as non-self recognition takes place.

Figures 21.11 and 21.16 do an awesome job summarizing B and T-cell responses to antigens. Note that T-cells must have antigens presented to them while B-cells may activate from direct contact with free antigen.

Figure 21.20 then combines humoral (B-cell) and cellular (T-cell) responses and depicts interactions between the two systems. An excellent figure.

Lastly, Table 21.7 provides a summary of cells and molecules of the adaptive immune system.

Vocabulary is needed to understand and explain concepts. Sample vocabulary includes:

- innate defense
- adaptive defense
- keratin
- mucous membrane
- gastric
- lacrimal
- pathogen
- sebum
- lysozyme
- phagocyte
- natural killer cell
- interferon
- complement
- pyrogen
- free macrophage
- fixed macrophage
- phagolysosome
- defensin
- peptide
- opsonins, opsonization

- major histocompatibility complex
- apoptosis
- inflammation
- toll-like receptors
- histamine
- kinin
- prostaglandins
- cytokines
- humoral
- antigen
- antigenic determinants
- hapten
- naive
- dendritic cells
- antigen presenting cells
- proliferation
- plasma cell
- clone
- memory cell

- effector cell
- apoptosis
- inflammation
- toll-like receptors
- histamine
- kinin
- prostaglandins
- cytokines
- humoral
- antigen
- antigenic determinants
- hapten
- naive
- dendritic cells
- antigen presenting cells
- proliferation
- plasma cell
- clone
- memory cell

- vaccine
- immunoglobulins
- gamma globulin
- antigen binding site
- agglutination
- complement fixation
- neutralization
- precipitation
- lysis
- helper T cells
- regulatory T cells
- CD4
- CD8
- cytotoxic T cells
- endogenous
- exogenous
- perforin
- granzyme
- respiratory burst

Major concepts that you must remember and understand include:

- General organization of the immune system.
- General organization of the innate defenses.
- General organization of the adaptive defenses.
- Basic groups of infectious agents.
- General locations where innate and adaptive defenses are present in the body.
- Direct association between lymph vessels, nodes, primary and secondary lymphoid tissues, blood, and immune cells.
- Defense mechanisms of the skin.
- Defense mechanisms of mucous membranes.
- Function of NK cells, dendritic cells, macrophages, neutrophils.
- Stimulation of, process of, and effects of inflammation.
- Mechanism of antigen recognition.
- Differentiation between interferon proteins and complement proteins.
- How interferons contribute to immunity.
- Activation of macrophages by chemical messengers.
- How complement assembles and contribute to immunity.
Contribution of fever to immunity.
Differentiating between humoral and cellular immune responses and actions.
The role of MHC in immune response.
Examples of common antigens and their characteristics.
Basics of B and T-cell maturation in primary lymphoid tissues.
Activation of naive B and T-cells.
Understanding of human antigenic receptors; diversity, genetic basis.
Presentation of antigens to lymphocytes by antigen presenting cells.
Primary response of B-cells to antigens.
Primary response of T-cells to antigens.
Interconnections between B and T-cell responses.
Importance of memory cells in subsequent infections.
Importance of helper cells in controlling aspects of innate and adaptive immunity.
How vaccines and gamma-globulin injections stimulate or supplement the immune system.
Basics of antibody structure and function. Defenses mediated by antibodies.
How cytotoxic T cells kill.
Unique responses of CD8 and CD4 lymphocytes to antigen activation.

Concepts you should learn on your own:
Immunoglobulin classes – various shapes of antibodies

Concepts you can skip:
Developmental aspects of the immune system
Homeostatic imbalances of immunity – optional reading but very interesting
Organ transplants and prevention of rejection – as above, interesting and may be something you read if you are going into medicine