***Immune System:*** protects the body’s internal environment, maintains homeostasis by removing damaged cells, and destroying the growth of abnormal cells.

***Immunocompetence:*** the immune system’s ability to mobilize and use its antibodies and other responses to stimulation by an antigen (ie: when the symptoms of the common cold disappear in 1 day)

***Inappropriate Immune Responses*** are broken down into 4 categories:

* ***Allergies:*** hyperactive responses against environmental allergens
* ***Immunodeficiency disorders:*** HIV/AIDS, chemotherapy, long term radiation or immunosuppressants (puts them at high risk for infection)
* ***Autoimmune:*** the body attacks parts of itself by the B and T cells producing ***autoantibodies*** (Lupus, Rheumatoid Arthritis, Glomerulonephritis, Thrombocytopenic Purpura, etc.)
* ***Attacks on Beneficial Foreign Tissue:*** organ transplant rejections and blood transfusion reactions

|  |  |  |  |
| --- | --- | --- | --- |
| Innate Immunity (Natural) | Adaptive Immunity (Acquired) | Humoral Immunity | Cell Mediated Immunity |
| The body’s FIRST line of defense.  Skin, Mucous Membranes, Tears, Saliva, Natural Intestinal and Vaginal Flora, Stomach Acid | The body’s SECOND line of defense.  Provides ***specific*** reactions to ***specific*** antigens.  Includes ***humoral*** and ***cell mediated*** immunity. | The body’s response to an antigen by production of antibodies by B cells and Helper T cells activate phagocytosis | Acquired immunity from T cells. |
| These organs, tissues, and secretions provide ***nonspecific*** immunity. | T & B cells  T cells release ***lymphokine*** to attack an inflammation.  Whan antigen and antibody react the ***complement*** system is activated which attracts phagocytes. | B cell proliferation is dependent on antigen stimulation.  They form antibodies once introduced to an antigen. | Works similarly to the B cells but the sensitized T cells remain in the blood and tissues indefinitely. Once the antigen is introduced they attach to it and destroy it. |
| Phagocytic cells migrate through the bloodstream and engulf (eat) the microorganisms that get past the initial barriers. | EXAMPLE: immunity from measles either from ***having*** measles (active natural) or being ***vaccinated*** against measles (active artificial). | EXAMPLE: patient gets chicken pox but is then immune to exposure in the future.  Patient gets the chicken pox vaccine and is then immune. | This works well for invaders that need to get inside the body’s cells to survive and reproduce. |
| EXAMPLE: bacteria tries to enter the body through the airways. Cilia, mucous, mucus membranes, saliva all work together to kill the offending bacteria. |  |  | Rejection of ***Allograft,*** hypersensitivity reactions and autoimmune diseases are malfunctions of this system. |
| Older adults have decreased innate immunity, so they are more at risk for infections such as gastrointestinal infections. | Older adults show deficiencies in B cell activity |  | Older adults have decreased cell mediated immunity, so it is important for them to get all vaccines (especially pneumonia) |

|  |  |
| --- | --- |
| Active | Passive |
| Natural: results from exposure to the infectious agent | Natural: results from the passage of maternal antibodies from mother to child |
| Artificial: results from an immunization or vaccination with an antigen | Artificial: results from the injection of antibodies from other sources (Tetanus Vaccination as it already ***HAS*** the antibodies in it) |

Leukocytes=White Blood Cells

Allograft: transplantation of tissue from the same species ie: organ transplantation

Isograft: transfer of tissue from genetically identical individual (twin)

Autologous: transfusion of one’s OWN tissue (blood)

Immunization: process of immunity through a controlled exposure to an attenuated organism to stimulate production of antibodies.

Hypersensitivity Reaction (AKA allergic reaction): most common is to penicillin.

Latex allergies: may also develop allergies to avocados, bananas, tomatoes, potatoes and get contact dermatitis (facilities have reduced the incidence of serious latex allergies by using only powder free gloves)

Plasmapheresis: removes pathologic substances present in the plasma (used in autoimmune disease)

IMORTANT: monitor for hypotension

* Removal of whole blood in one arm
* Circulation of blood through cell separator
* Separation of plasma and its cellular components
* Removal of undesirable components
* Infuse Lactated Ringers to replace volume
* Remainder of plasma returned through vein in opposite arm

PHYSIOLOGIC RESPONSE OF AN ALLERGIC ASTHMA ATTACK

* Exposure to allergen
* Activation of Mast Cells
* Release of histamine
* Vasodilation
* Edema
* Bronchospasm (epinephrine will cause bronchodilation)

BLOOD TRANSFUSIONS:

* Blood must be transfused within 4 hours of coming out of the fridge.
* Symptoms of a transfusion reaction include
* Chills
* Itching
* Shortness of breath
* Orthopnea (dyspnea while lying flat) EARLY SIGNS!!!!!!!!
* Immediately STOP the transfusion and infuse normal saline
* Provide oxygen through a nonrebreather mask (also for anaphylaxis)

DESENSITIZATION:

* Patient is injected with increased amounts of the antigen every 6 weeks in cycles
* Make sure to observe the patient for at least 20 minutes after injection
* If a reaction occurs immediately give subcutaneous epinephrine

ANTIHISTAMINES:

* Benadryl: causes drowsiness
* Allegra, Zyrtec, etc: do NOT cause drowsiness

