The Immune System and The Important Role of Bone Marrow

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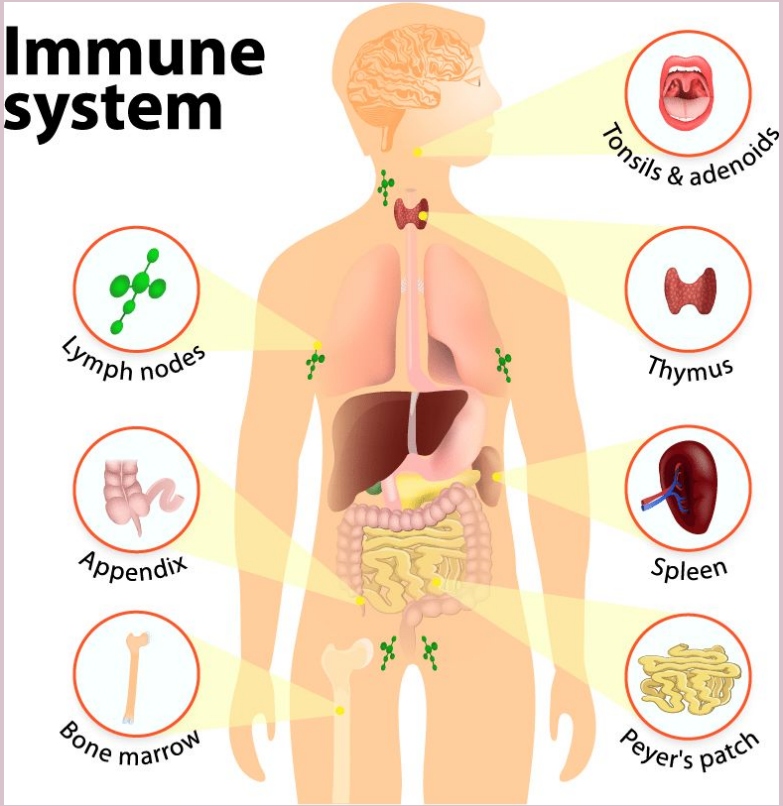
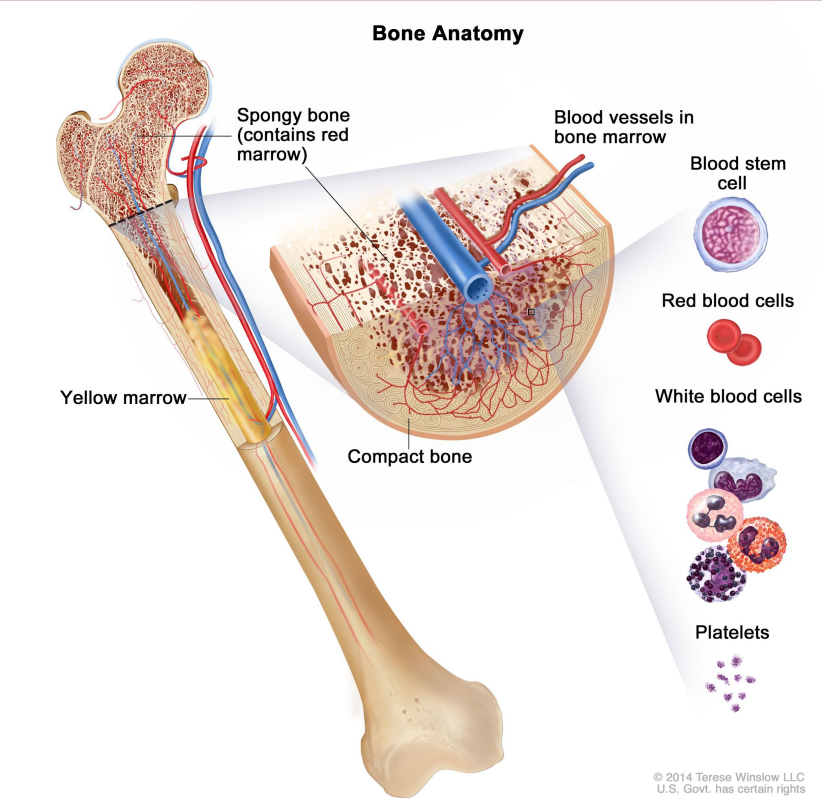
What does the Immune System do?

- Destroys and neutralizes pathogens
- Works along side with the lymphatic system
- Lymphatic system helps with filtering through pathogens



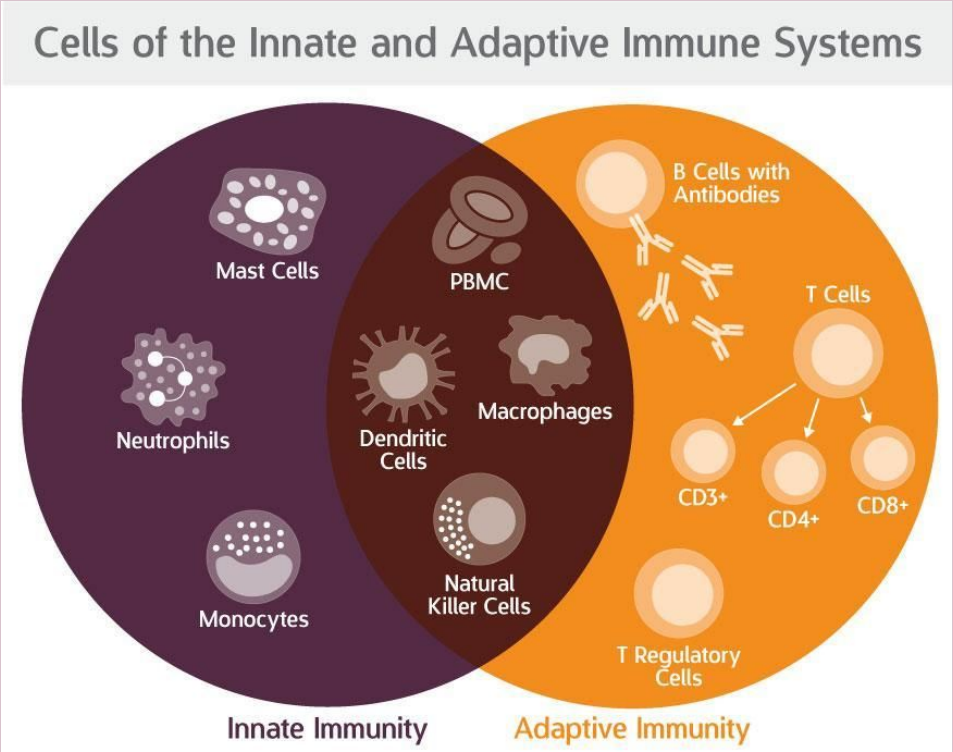
The Bone Marrow



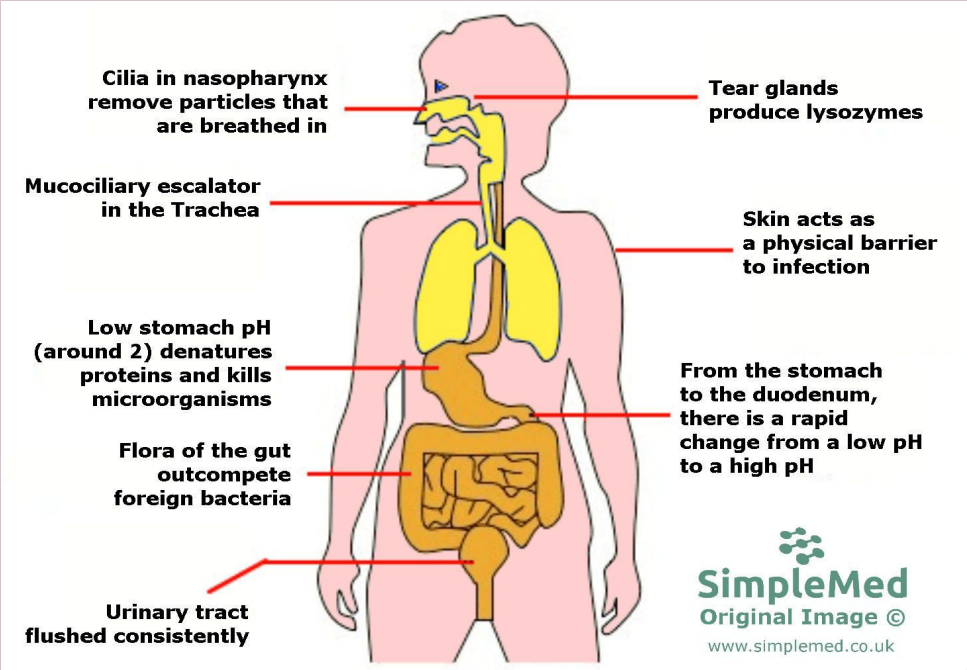
- Primary lymphoid/hematopoietic organ
- Immune regulatory organ
- Produces important blood cells:
    - B cells
    - T cells

Immune Responses

- How the body recognizes and defends itself against antigens
- Our body has a few different types of immunity reactions:
  - Innate Immunity
  - Acquired/active Immunity
  - Passive Immunity



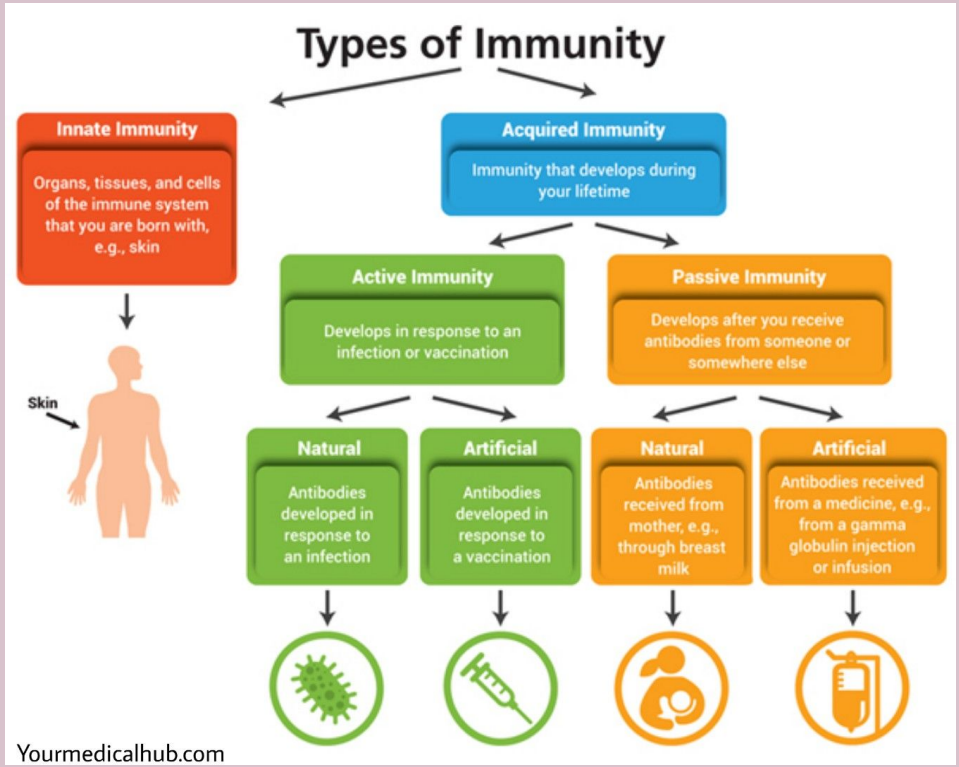
Innate Immunity



- Born with this defense mechanism
- Protects against all antigens
- Barriers are key for protection

Acquired/Active Immunity

- Immune system will build its defense this way
- Also known as adaptive immune system

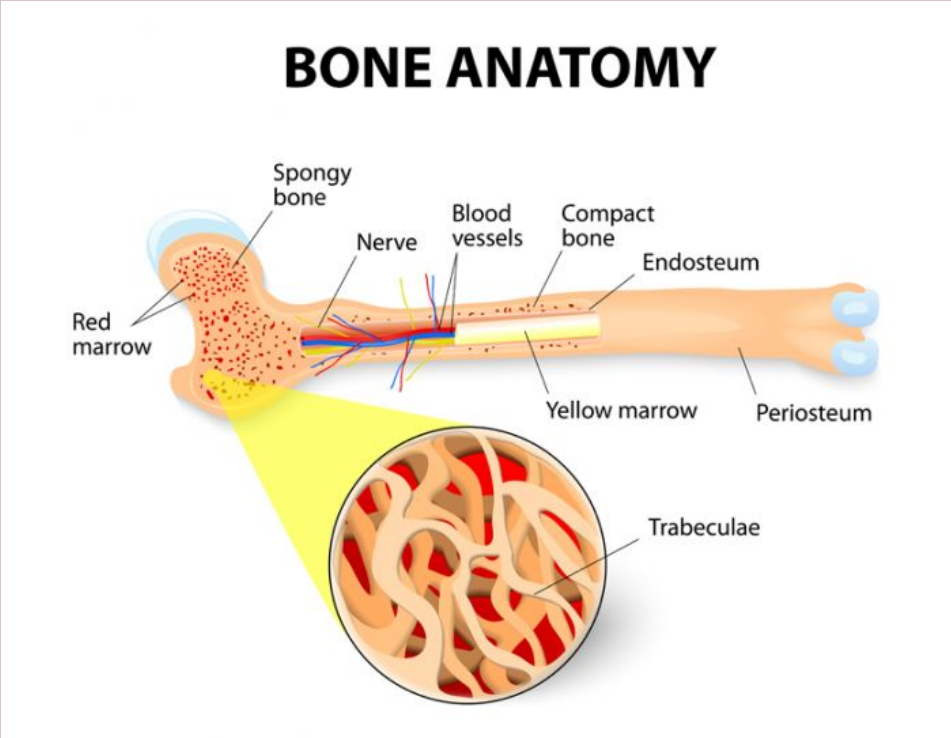


Passive Immunity

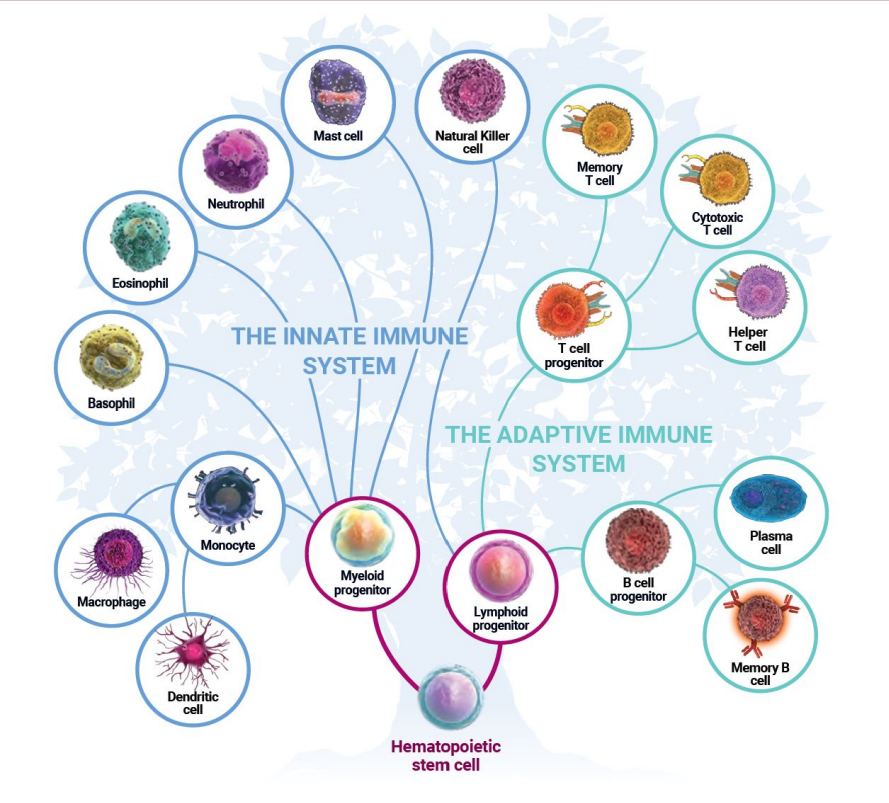
- Antibodies produced in another body and then transferred over
- Antibodies that are given by mothers disappears between the ages 6 to 12 months
- Passive immunization

Where is Bone Marrow Found?

- Bone marrow is located in the center and the epiphyses of the bone
- There are two types of bone marrow:
    - Red bone marrow
    - Yellow bone marrow



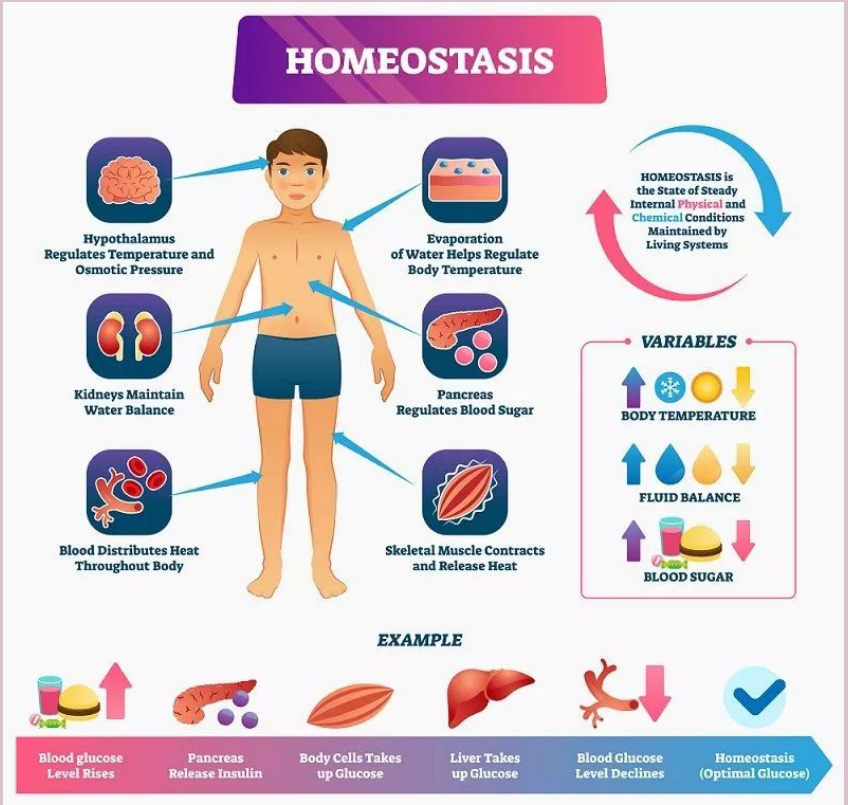
The Cells That Do Work



- B cells are apart of the adaptive immune system
    - Activation of the B cell must occur to produce antibodies
- T cells are also apart of the adaptive immune system and are responsible for fighting off antigens
    - T cells are activated when helper T cells give them a secondary signal

Maintaining Homeostasis

- The immune system is important for maintaining homeostasis
- The immune system responds to the external environment
- Bone marrow can also aid in homeostasis with the help of the skeletal system

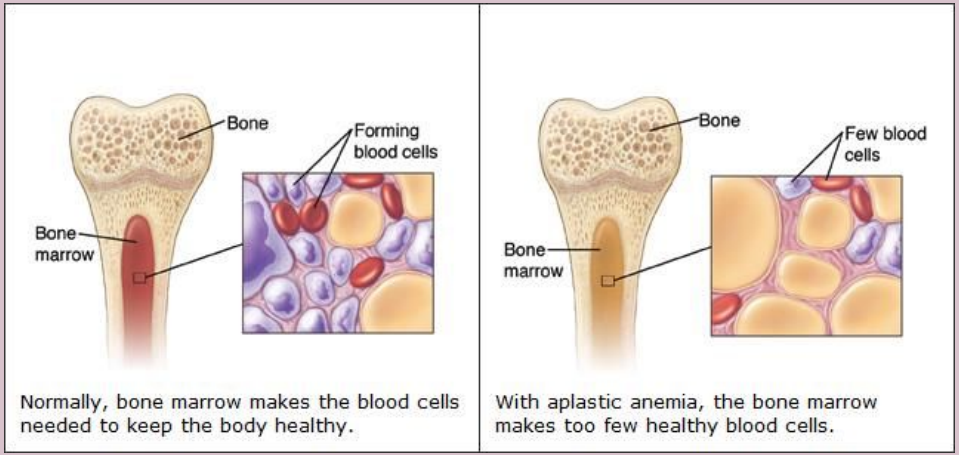


What Would Happen If The Immune System Wasn't Working?

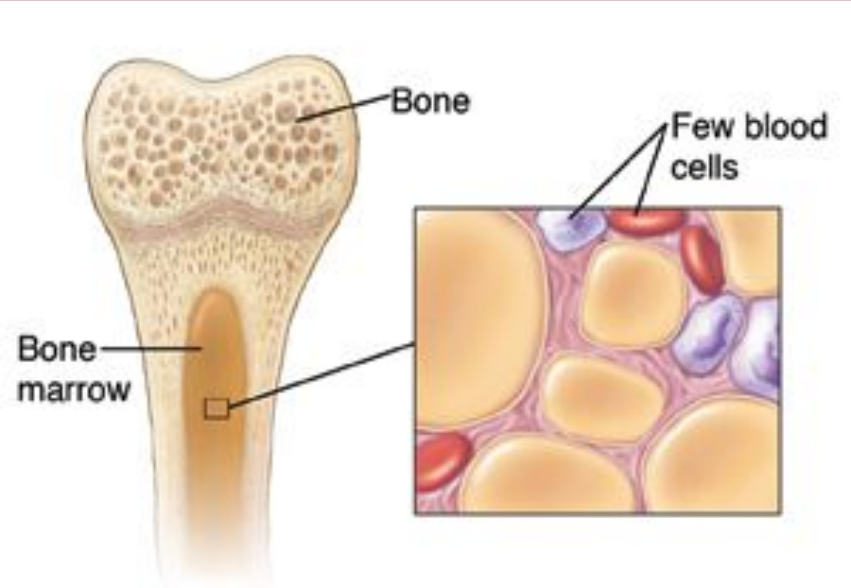
- Without the bone marrow functioning properly, the immune system will get affected as well
- Can't fight of infections
- Increased risks of diseases and illnesses
- Organ failure
- Death

Bone Marrow Disorder: Aplastic Anemia

- This is a disorder of the bone marrow that causing it to not be able to produce red blood cells
- Rare and can be life-threatening
    - Connections with other rare disorders
- The common cause for this rare disorder is the immune system attacking the stem cells in the bone marrow



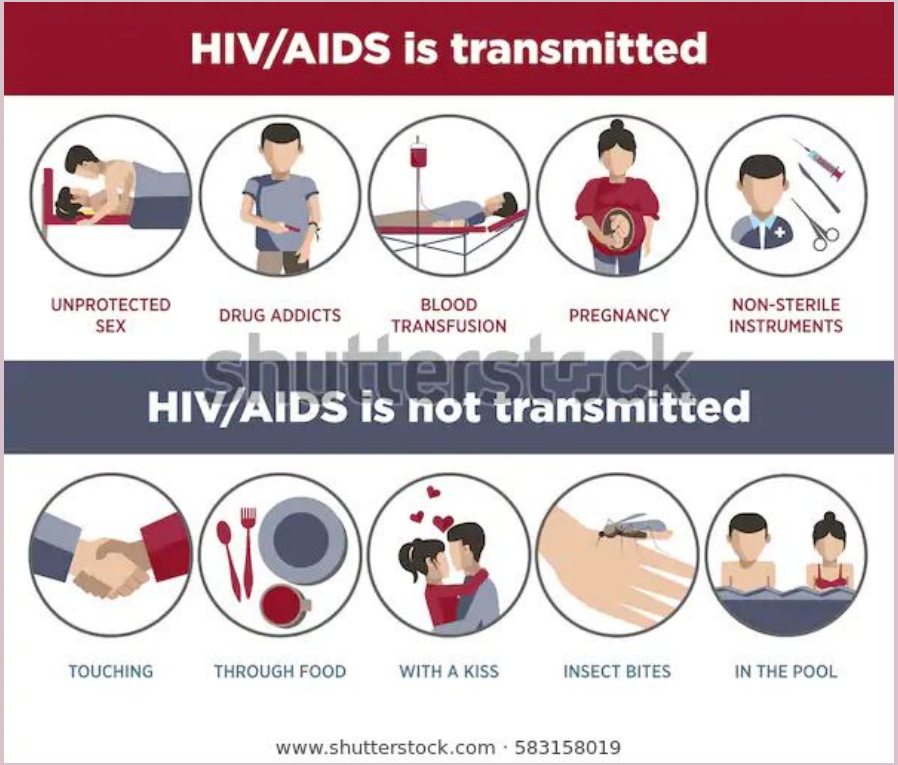
Preventions and Treatments for Aplastic Anemia



- There are no prevention steps for this disorder
- Avoiding exposure to toxic chemicals may help lower the risk for the disease but it is not certain
- Treatments for aplastic anemia can vary depending on how severe the condition and the age of the patient

AIDS: Immune System Disorder

- AIDS stands for acquired immunodeficiency syndrome
- It is a chronic, life-threatening condition that damages the immune system
- It is caused by the human immunodeficiency virus (HIV)



Prevention and Treatments for AIDS

- There is no vaccine to prevent HIV/AIDS, but there are steps to protect yourself and other from infection
- There is no cure for HIV/AIDS, but medication can be taken to slow down the progression
- The medication has been able to reduce the number of deaths

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