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Understanding the Immune System

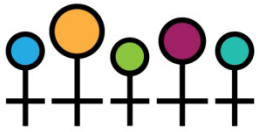
Last updated: April 27, 2023

Together, we can change the course of the HIV epidemic...one woman at a time.

#onewomanatatime

www.thewellproject.org

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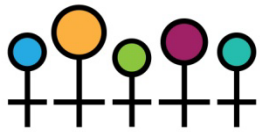


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Understanding the Immune System

Your immune system is your body's defense system

- Made up of **cells and organs** that protect your body from invaders that can cause infection and disease
- Gets rid of abnormal pre-cancerous cells and cancerous cells that are growing out of control
- When it's working, it fights off infection and keeps you healthy
- When it isn't, germs and other abnormal cells in the body can more easily cause infections and disease



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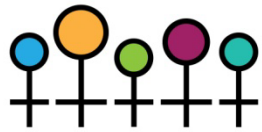
Key Organs of the Immune System

Skin:

- Single largest organ of the body
- First line of defense against germs – provides a physical barrier that keeps bacteria and viruses from entering the body

Bone marrow:

- Makes white blood cells that protect the body from invaders and possibly dangerous abnormal cells
- White blood cells then travel to the **lymph organs**
 - There await instructions to fight infection



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Key Organs of the Immune System

Lymph Organs:

- **Lymph Nodes**
 - Located throughout body
 - Contain cells ready to fight invaders
- **Spleen**
 - About the size of a fist; located in the upper left of the abdomen
 - Filters blood; identifies and gets rid of worn-out white blood cells

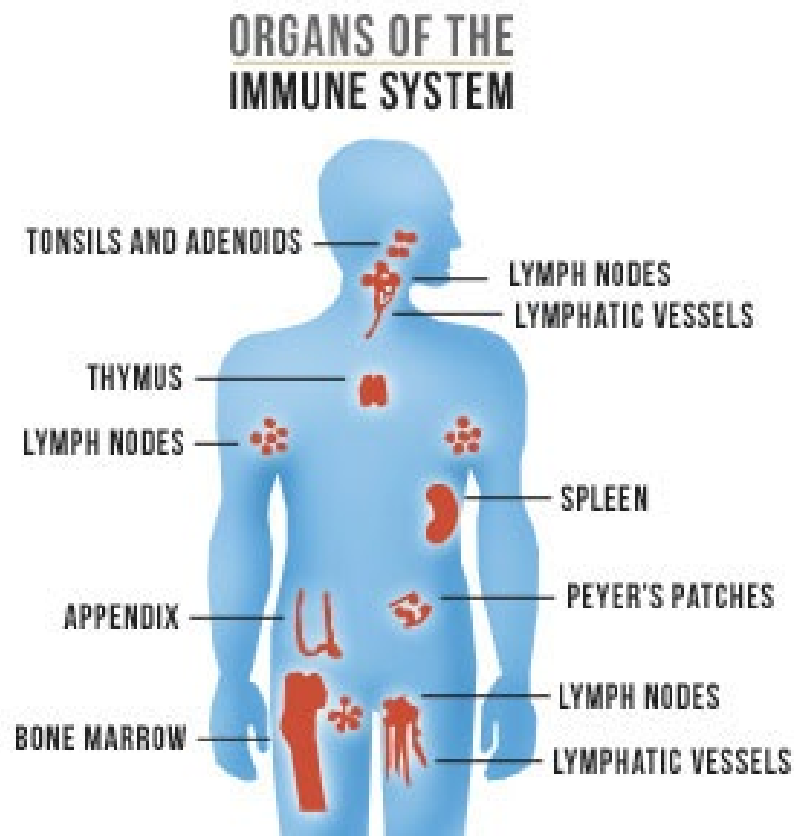


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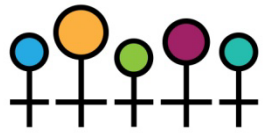
Key Organs of the Immune System

Other Lymph Organs:

- Peyer's patches
 - Clumps of tissue in the small intestine
- Thymus
- Appendix
- Tonsils and adenoids



Credit: AIDS.gov



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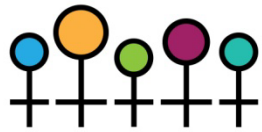
Key Cells of the Immune System



Credit: NobelPrize.org

Key immune system cells include:

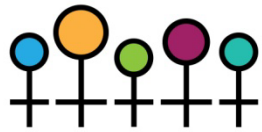
- Dendritic cells and macrophages
- T cells
- B cells



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HIV and the Immune System

- HIV attacks CD4 T cells
- Your body produces antibodies, **but:**
 - Antibodies don't get rid of HIV
 - HIV uses the CD4 T cells to make copies of itself
- Being HIV antibody positive means that you are likely living with HIV
 - Antibody test is standard HIV test

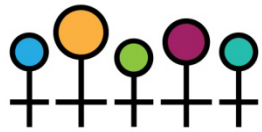


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HIV and the Immune System

HIV uses CD4 T cells to **make more copies of itself**

- As HIV reproduces, it damages or kills CD4 cells
 - Immune cells don't know which invaders to remove
 - Creates risk for opportunistic infections and cancers that don't harm people with healthy immune systems
- ***Antibodies alone aren't enough to get rid of HIV***
 - HIV changes faster than immune system can respond

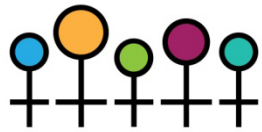


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HIV Reservoirs

- Collections of inactive, “resting,” or latent HIV-infected cells
- Known reservoirs include immune cells in gut, lymphoid tissue, blood, brain, genital tract, bone marrow
- Completely eliminating HIV from the body will require emptying the reservoirs/preventing latent cells from multiplying

Early treatment with a combination of HIV drugs can minimize the size of the reservoir



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HIV and the Immune System

- Newer HIV drugs are more effective at stopping HIV from multiplying and infecting more CD4 cells
- Since CD4 cells are key to a healthy immune response, this can give your immune system a chance to replenish its supply of CD4 cells and to defend itself (you!) against opportunistic infections



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Nutrition Tips for a Healthy Immune System

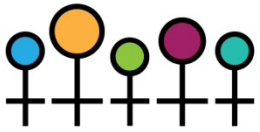
- Eating well is important for staying in good health
- Immune system of a person living with HIV is always activated or "turned on" – can produce inflammation
 - Related to heart disease, cancer, other conditions
- Several foods can help reduce inflammation (green leafy vegetables; broccoli; certain fish, fruits, nuts, oils, seeds, or spices; tomatoes; others)
- Nutritionist or registered dietician can help you figure out what kind of diet is best for you



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Other Ways to Stay Healthy

- Healthy diet
- Take HIV drugs exactly as prescribed
- Stop smoking
- Drink less (or no) alcohol



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Learn More!

- To learn more about this topic, please read the full fact sheet on this topic:
 - Fact sheet: [Understanding the Immune System](#)
- For more fact sheets and to connect to our community of women living with HIV, visit:
 - www.thewellproject.org
 - www.facebook.com/thewellproject
 - www.twitter.com/thewellproject