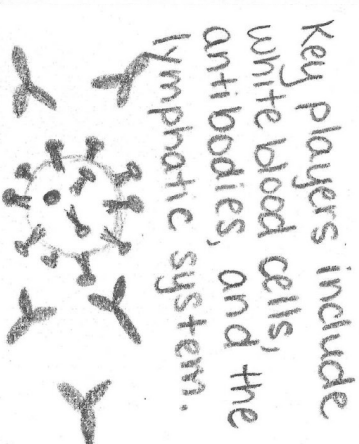




Key players include white blood cells, antibodies, and the lymphatic system.

It is our body's defense system against harmful invaders like bacteria and viruses.

What is the Immune System anyway?

- only 1-2 vaccine doses of every 1 MILLION result in allergic reaction.
- only a 1 in a MILLION chance of encephalitis with the MMR vaccine.
- Less than a 1 in a MILLION chance of Guillain Barre syndrome.
- 0 in 10,000,000 dose chance of AUTISM.
- Always consult your healthcare provider.

- ## Safety
- ### MONITORING
- BEFORE A VACCINE EVEN EXITS A MANUFACTURING PLANT, SAFETY MONITORING HAS BEGUN:
- FACILITY TESTING
 - BATCH TESTING
- ### EXTERNAL SAFETY NETS:
- Vaccine Adverse Events Reporting System (VAERS), where ANYONE can report a POTENTIAL reaction.
 - Vaccine Safety Datalink(s) For healthcare systems who investigate and research Vaccine Safety.
 - Clinical Immunization Safety Assessment Project (CISA)
- A network of vaccine safety experts, medical research centers, and public health partners

- ## Immune Response
- Step 1: Body detects the vaccine and sees it as a threat.
- Step 2: White blood cells (B cells and T cells) respond and produce antibodies.
- Step 3: Memory cells store the "blueprint" for faster responses in the future.
-
- Memory cells can remain in the body for months, years, even decades, depending on the vaccine.

VACCINES:

A clear guide to how vaccines work in our bodies

By: LMF

Vector-Based Vaccines

These use a harmless virus (the vector) to deliver genetic material from a pathogen into the body. This tells cells to produce a specific protein from the pathogen, which triggers an immune response without causing disease.

Examples:

- Ebola Vaccine

SCHEDULE

Know when to get vaccines at recommended intervals

www.CDC.gov/vaccines/hcp/immunz-schedules/index.html

INACTIVATED VACCINES

These use a killed or inactivated version of a pathogen to stimulate an immune response. Because it is dead or non-replicating, it cannot cause disease.

Unlike live attenuated vaccines, inactivated vaccines often require multiple doses or booster shots to maintain immunity.

- Salk Polio Vaccine
- Hepatitis A Vaccine
- Rabies Vaccine
- Influenza Vaccine



Vaccines mimic a disease without full-blown illness.

Types include:

- Live Attenuated
- Inactivated
- mRNA
- Subunit
- Vector Based

Success Rates

92% OF PARENTS

ensure their kids are VACCINATED by

Broadly

making the number of CHILDREN who die from vaccine preventable disease at an ALL-

TIME LOW.

They have prevented over 1 MILLION deaths in the U.S. Since 1994.

Vaccines provide a **SAFE** and effective way to train your immune system, preparing it to fight **REAL DISEASE**, without the risks associated with infection. This is **ESSENTIAL** for personal AND public health.

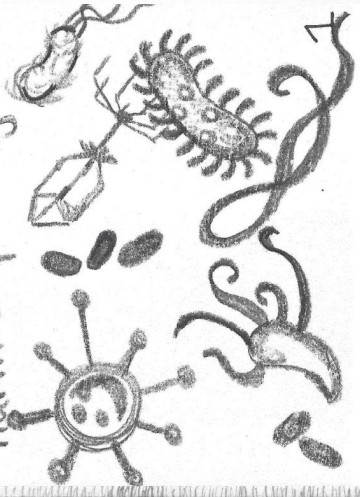
Live Attenuated Vaccines

These use a weakened (attenuated) form of a pathogen that causes disease to illicit a strong immune response without causing illness.

Because they mimic a natural infection closely, memory cells provide longer immunity.

Examples:

- Measles, Mumps, and Rubella (MMR)
- Varicella (Chicken Pox)
- Rota Virus
- Oral Polio Vaccine



They save lives by training our immune systems to fight harmful pathogens.

Vaccines are medical tools designed to prevent diseases.

Subunit Vaccines

These vaccines contain only specific pieces, (subunits) of a pathogen, such as proteins, sugars, or other molecules, rather than the entire virus or bacteria. These trigger a robust immune response while minimizing side effects.

Examples:

- Hepatitis B vaccine
- HPV vaccine
- Pertussis Vaccine
- Shingles Vaccine



SOURCES:

- www.theLancet.com
- www.who.int
- www.cdc.gov
- www.nih.gov
- www.gavi.org
- www.mayoclinic.org
- www.historyofvaccines.org

"Deadly Choices: How the Anti-Vaccine Movement Threatens Us All" by Paul A. Offit, MD
 "Pox: An American History" by Michael Willrich
 "The Panic Virus" by Seth Mnookin

mRNA vaccines

These use a small portion of messenger RNA to teach the body's cells how to produce a harmless piece of a pathogen which then triggers an immune response without using the actual pathogen, thus providing immunity.



Examples:

- COVID-19
- in development: HIV, Zika, influenza, malaria, and more.