

National Immunization Awareness Month

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Immunization!!!! What does this mean? Is it safe? Do we really need it? You have all heard these questions and have probably already made up your mind.

This subject needs conversation, education, training, and awareness now more than ever before. August is National Immunization Awareness Month (NIAM), designated to increase awareness of the importance of vaccination for all age group.

Considering the recent national outbreak of Measles and the debate between those who support vaccination and those who do not. I will try to cover some common questions. But first, I would like to briefly describe the science behind immunization. Immunization is a measure used to prevent serious and life-threatening illnesses. Because of the vaccines, some illnesses like polio and diphtheria are rare in the USA.

Vaccines prepare the body for possible colonization and subsequent infection by pathogenic micro-organisms. When these micro-organisms attack the body and initiate the infection, cascade of various defense mechanisms begins. Immune system is very complex and without going in detail I just like to mention the two types of Lymphocytes. Lymphocytes are the type of Leukocytes also called the White Blood Cell (WBC). These Lymphocytes start out in Bone marrow, if stay there and mature called B-cell. These cells are responsible for making antibodies against the infectious agents. And if lymphocytes go to thymus gland and mature there, called T-cells. B-cells need T-cells to destroy the pathogens. Some T-cells and B-cells turns into memory cells and as the name suggests Memory cell is the cell has a memory to the exposure and in the case to re-exposure activate the defense mechanism more quickly. Scientists use this knowledge to develop the vaccine. Vaccines contain the antigen, which comes from weakened or killed germ or part of the germ that can cause the immune system to respond but not enough or strong to develop an infection. The administration of the vaccine triggered the immune mechanism and body to develop Antibodies and memory cell. Now the body is ready to defend in case of a real infection.

One very common Myth is that the vaccine is only for infants which is not true. After a certain time, the benefits of vaccines diminish, for that reason, children and adults both need the vaccine. Especially health care workers are at risk to get exposed to infectious agents, that's why it's important to get a vaccine against Seasonal Flu, tetanus and Pertussis (Tdap or Td), Hepatitis B (HepB), Measles, Mumps and Rubella (MMR), Chickenpox (varicella), Meningococcal. If you are traveling, you must consult the immunization expert to find out which types of immunization you needed. Below is the childhood immunization chart copied directly from CDC website.

Vaccine-Preventable Diseases and the Vaccines that Prevent Them
child vaccine-preventable disease easy read

| Disease | Vaccine | Disease spread by | Disease symptoms | Disease complications |
|------------|--|---------------------|----------------------------------|---|
| Chickenpox | Varicella vaccine protects against chickenpox. | Air, direct contact | Rash, tiredness, headache, fever | Infected blisters, bleeding disorders, encephalitis (brain swelling), pneumonia |

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| | | | | (infection in the lungs) |
| Diphtheria | DTaP* vaccine protects against diphtheria. | Air, direct contact | Sore throat, mild fever, weakness, swollen glands in neck | Swelling of the heart muscle, heart failure, coma, paralysis, death |
| Hib | Hib vaccine protects against Haemophilus influenzae type b. | Air, direct contact | May be no symptoms unless bacteria enter the blood | Meningitis (infection of the covering around the brain and spinal cord), intellectual disability, epiglottitis (life-threatening infection that can block the windpipe and lead to serious breathing problems), pneumonia (infection in the lungs), death |
| Hepatitis A | HepA vaccine protects against hepatitis A. | Direct contact, contaminated food or water | May be no symptoms, fever, stomach pain, loss of appetite, fatigue, vomiting, jaundice (yellowing of skin and eyes), dark urine | Liver failure, arthralgia (joint pain), kidney, pancreatic, and blood disorders |
| Hepatitis B | HepB vaccine protects against hepatitis B. | Contact with blood or body fluids | May be no symptoms, fever, headache, weakness, vomiting, jaundice (yellowing of skin and eyes), joint pain | Chronic liver infection, liver failure, liver cancer |
| Influenza (Flu) | Flu vaccine protects against influenza. | Air, direct contact | Fever, muscle pain, sore throat, cough, extreme fatigue | Pneumonia (infection in the lungs) |
| Measles | MMR** vaccine protects against measles. | Air, direct contact | Rash, fever, cough, runny nose, pink eye | Encephalitis (brain swelling), pneumonia (infection in the lungs), death |

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|--------------|--|--|--|--|
| Mumps | MMR** vaccine protects against mumps. | Air, direct contact | Swollen salivary glands (under the jaw), fever, headache, tiredness, muscle pain | Meningitis (infection of the covering around the brain and spinal cord), encephalitis (brain swelling), inflammation of testicles or ovaries, deafness |
| Pertussis | DTaP* vaccine protects against pertussis (whooping cough). | Air, direct contact | Severe cough, runny nose, apnea (a pause in breathing in infants) | Pneumonia (infection in the lungs), death |
| Polio | IPV vaccine protects against polio. | Air, direct contact, through the mouth | May be no symptoms, sore throat, fever, nausea, headache | Paralysis, death |
| Pneumococcal | PCV13 vaccine protects against pneumococcus. | Air, direct contact | May be no symptoms, pneumonia (infection in the lungs) | Bacteremia (blood infection), meningitis (infection of the covering around the brain and spinal cord), death |
| Rotavirus | RV vaccine protects against rotavirus. | Through the mouth | Diarrhea, fever, vomiting | Severe diarrhea, dehydration |
| Rubella | MMR** vaccine protects against rubella. | Air, direct contact | Sometimes rash, fever, swollen lymph nodes | Very serious in pregnant women—can lead to miscarriage, stillbirth, premature delivery, birth defects |
| Tetanus | DTaP* vaccine protects against tetanus. | Exposure through cuts in the skin | Stiffness in neck and abdominal muscles, difficulty swallowing, muscle spasms, fever | Broken bones, breathing difficulty, death |

* DTaP combines protection against diphtheria, tetanus, and pertussis.

** MMR combines protection against measles, mumps, and rubella.

This schedule is recommended by the Advisory Committee on Immunization Practices ([ACIP](#)) and approved by the Centers for Disease Control and Prevention ([CDC](#)), American Academy of Pediatrics ([AAPExternal](#)), American Academy of Family Physicians ([AAFPExternal](#)), and American College of Obstetricians and Gynecologists ([ACOGExternal](#))

Does Immunization make you sick? Is it harmful? As I mentioned before the vaccine compose of killed, or part of the germ which cannot have the ability to cause an infection. But there are some other ingredients used, Like

- Aluminum salt or gel is used as adjuvants to make the vaccine more specific and potent.
- Antibiotic added in some to prevent contamination.
- Egg Protein found in yellow fever and most Influenza Vaccine because chicken eggs are used to the prepared vaccine.
- Formaldehyde is used but removes before the packaging of vaccine vials. It's usually added to Toxoid vaccine to inactivate the toxic substances.
- Monosodium Glutamate (MSG) and 2- Phenoxy-Ethanol is used to Stabilized the vaccine.
- Thermosal is mercury-containing preservative used in multidose vials to prevent the contamination.

But there is no evidence that these chemicals which are present in very small amount, cause any health issue. vaccines are tested for safety and effectiveness in clinical trials before they are licensed for use in the United States, and they are continuously monitored by CDC and FDA once they are approved. Any vaccine like any other medicine can cause side effects. In most part, those are minors like soreness at the site of injection, Low-grade fever, Headache which goes away in a few days. In very rare cases some vaccine can cause a serious problem. However, the vaccine provides more value than a side effect or discomfort. Non-Immunization put the child and others on risk to contract the deadly disease. Giving Multiple vaccines at the same time is safe. Some Vaccine is not recommended during pregnancies Like HPV (Human papillomavirus), MMR, Varicella (chicken pox) vaccine. But some vaccine like Whooping cough (Pertussis) and Hepatitis B is recommended.

MY conclusion is that immunization is enhance natural immune mechanisms and not only protect you but the other who are not able to immunize because of medical reasons such as suppressed immune systems and age limitation. The benefits of vaccines far outweigh the risk and have saved more life than any other medical intervention.

Reference: <https://www.cdc.gov/vaccines/>