

VACCINATIONS

It has been recognized for several hundred years that exposure to an infectious disease can make one immune from getting the same disease in the future. In particular, for most of the twentieth century, everyone knew that if you had a childhood illness such as chicken pox, that you could not catch it again. Starting in the 1950s, with the polio vaccine, there was widespread recognition that the transmission of some quite serious human diseases could be all but eliminated, and childhood polio was virtually eliminated in the United States in only a few years. Similarly, by the 1970s, with great international effort, smallpox was eliminated from the entire world. Childhood vaccinations are now routinely given to prevent a number of diseases, and in the last few decades, a number of vaccines have also been developed to prevent illness, and even death, in older adults. For example, besides the normal childhood vaccinations, it is recommended that everyone get influenza vaccine each fall, and for adults over 60, the pneumococcal vaccine and vaccine for shingles (a late-life complication related to having chicken pox as a child) are beneficial.

So, vaccines are now part of a healthy individual's life from birth to old age.

Vaccines help infants and toddlers acquire immunity to otherwise lethal infections, such as measles, tetanus, and diphtheria, and are initiated as early as two months after birth. In adults and the elderly, vaccines help boost the immune system, fighting off bacteria that cause pneumo-

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nia and viruses that cause the flu. Some vaccines may have to be given again, in order to “reboot” the immune system. An immune system’s memory may decline over time, so vaccines such as tetanus require a “booster” dose. The influenza vaccine is unique among vaccines, as it is given annually because the influenza virus mutates (or changes) constantly. So, each year’s vaccine supply is engineered to create immunity to a few types of the virus judged most likely to be circulating in the upcoming flu season.

The Risk of Failing to Be Vaccinated

Available vaccines are intended to prevent significant injury from an infection, as well as the most serious complication of an infection – death. Even with antibiotics, which are intended to kill the bacteria that cause an active infection, many of the vaccine-preventable diseases can cause significant morbidity. This is why vaccines are so important for children, especially infants and toddlers, who are still growing and developing rapidly. Serious infections can injure growing organs, with the potential to result in lifelong complications and disability. For example, *Bordetella pertussis*, the bacteria that causes “whooping cough,” may cause a toddler, whose lungs are still developing and growing, significant lung injury, resulting in poorly developed parts of the lung that will persist into adulthood.

Influenza vaccinations and the “pneumonia” vaccine (which is intended for the bacteria *Streptococcus pneumoniae*, a common cause of pneumonia) are important to obtain as adults, especially for high-risk populations, such as those with HIV infection and adults over 60. As mentioned earlier, the most effective way

to manage infections, including the flu, (influenza is the virus that causes the “flu”) and pneumonia, is to prevent them from occurring. Both of these infections are dangerous and leading causes of death in high-risk populations.

Childhood vaccinations and adult vaccinations have specific guidelines for when to obtain them. However, some vaccines have restrictions because of the agent that is in them. For example, the influenza vaccine given nasally has a live virus. This live virus is harmless in persons with a normal immune system but should not be given to people with weakened immune systems. Therefore, before obtaining any vaccines, especially live virus vaccines, tell your health care provider if you live with anyone with a weak immune system (e.g., an infant, someone with HIV infection, on immunosuppressant drugs or undergoing chemotherapy, or older adults). Individuals should have conversations with their respective health care provider to assure the proper timing of vaccines, as well as the safety of the vaccine and its recipient.

In spite of the demonstrated effectiveness of vaccines, an alarming development is that compliance with receiving vaccinations has decreased in the pediatric population. In the early 2000s, measles was at its lowest rate of incidence ever recorded, but avoidance of this vaccine in recent years has led to a resurgence of measles. And we see that large numbers of adults (up to 40 percent of Medicare beneficiaries) do not take advantage of vaccines that can prevent serious illness, hospitalizations, and even death.

One issue that has impacted the use of childhood vaccines is the controversy over vaccines and autism. The original study suggesting an association has been shown to be false, undergoing retraction by the medical journal that published it (the most extreme measure the medical community can take toward a fraudulent study). Research has not found any connection between autism and childhood vaccines.

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