**Parents PACK Newsletter**  
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Why should my baby get so many vaccines before 24 months of age?

New parents have barely had a chance to “meet” their baby before they are asked to permit that baby to get a hepatitis B vaccine. Then, often while still on maternity leave, a slew more — up to six doses at 8 weeks of age. By the baby’s first birthday, more than 20 doses. Many of these doses are to protect against diseases parents have never had, or even known others who have. It is no wonder some parents balk at these requests, or at least ask, “Why should we consent to this?”

Understanding why vaccines are given so early in life and why so many doses of some vaccines are necessary can help make sense of this important parental decision.

**Birth**

**Hepatitis B** vaccine is recommended for most babies within 24 hours of birth. Because hepatitis B is often considered to be a sexually transmitted disease, parents wonder why a newborn needs it. Three factors make hepatitis B a risk for anyone, including newborns:

1. **Hepatitis B is transmitted through blood.** When people are infected with hepatitis B, they have up to 1 billion infectious virus particles in one-fifth of a teaspoon of their blood. This large quantity of the virus means that even a very small quantity of blood — less than can be seen with the naked eye — can result in transmission. In fact, hepatitis B is significantly more easily transmitted than HIV.

2. **Hepatitis B virus is hardy, meaning that it can survive outside of the body on harsh surfaces,** or those not typically considered “friendly” to viruses, such as tables, clothing or toothbrushes, for up to seven days. So people, including babies, can be exposed to the virus if invisible amounts of blood from someone infected with hepatitis B remains on surfaces or items, such as washcloths.

3. **Many people do not realize they are infected,** so it is difficult to protect children from exposure when you don’t know that they are being exposed.

Before widespread vaccination, about 9,000 children every year in the U.S., were infected in some way other than through birth from an infected mother. Many never figured out how or when.

**Vaccines at two-, four-, and six-month visits**

The bulk of vaccine doses during the first two years of life are given during these three visits. In addition to one or two more doses of hepatitis B vaccine, infants receive vaccines to protect against seven other diseases.

**Rotavirus** — Rotavirus vaccine is the only vaccine routinely recommended in the U.S. that is given by mouth. This vaccine is best started by the time an infant is 15 weeks old. The reasons for the timing of this vaccine is that rotavirus is most likely to infect young children, particularly infants. Because it can quickly lead to dehydration, it can result in a medical emergency, so it is better to prevent this infection if possible.

**Diphtheria, tetanus, and pertussis** — These vaccines have been given in combination since the late 1940s. The version used for babies is referred to as DTaP. It made sense to put these vaccines together, reducing three shots to one, because they are made in the same way, and they protect against these diseases in a similar way.

Diphtheria, tetanus, and pertussis are each caused by bacteria that make people sick by producing harmful proteins, called toxins. These toxins act like poisons, causing illness. By using inactivated toxins, called toxoids, as the vaccine, people develop antibodies that protect them if they are infected.

Of these three diseases, a baby is most likely to be exposed to pertussis, and pertussis is also the most dangerous because it causes a narrowing of the windpipes that makes it difficult for babies to get enough oxygen when they experience repeated bouts of coughing. Pertussis tends to be under-diagnosed in older children and adults, who frequently transmit it to babies. Unfortunately, of these three vaccines, pertussis is also the one that is least effective. Nonetheless, those immunized with pertussis vaccine are seven times less likely to be infected during an outbreak than those who aren’t immunized.

**Haemophilus influenzae type b and pneumococcus** — Although these vaccines are not given together, both protect against bacteria that can make children younger than 2 years of age very sick with meningitis (an inflammation of the brain), pneumonia, or bloodstream infections. Young babies have a limited ability to make antibody responses to bacteria like Haemophilus influenzae type b (Hib), pneumococcus, and meningococcus.

Hib and pneumococcus were the most frequent causes of severe illness in young children before vaccines were available. Because of the limitations of making an immune response against them, vaccine technology had to be developed that could overcome this. Researchers found a solution by adding a harmless protein, called a conjugate protein, to the parts of the bacteria that cause disease. Healthcare providers were ecstatic when they had a way to protect babies from the illnesses caused by these two diseases.

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**Trivia Corner**

What is the difference in immunity from breastfeeding and immunity from vaccination?

a.) Vaccines provide long-term immunologic memory whereas breastfeeding provides short-term immunologic memory.

b.) There is no difference — breastfeeding and vaccination both provide long-term immunologic memory.

c.) Vaccines provide short-term immunologic memory whereas breastfeeding provides long-term immunologic memory.

d.) There is no difference — breastfeeding and vaccination both provide short-term immunologic memory.
Why should my baby get so many vaccines before 24 months of age? [cont.]

Because meningococcus does not occur as frequently, only babies considered to be at highest risk typically receive a meningococcal vaccine in infancy.

**Polio:** Although polio has almost been eradicated, or eliminated from the entire world, it still occurs in a small number of countries. The disease is highly contagious, and while most recover, not all do so without consequence. Before a vaccine was available, every year, some children were paralyzed following polio infections. Parents in the 1950s were so scared of their children getting polio during the summer that they would keep them from swimming in pools, going to church, etc.

Because we don’t see polio in the U.S., it would be easy for a parent to consider foregoing this vaccine. But polio is highly contagious and could easily re-emerge if immunization rates decrease. In fact, in September 2019, the first case of polio in the Philippines in nearly two decades was announced. Unfortunately, this development is a reminder of how quickly polio could re-emerge if immunization rates are not high enough.

**Vaccines at 12- to 15-month visits**

In addition to third or fourth doses of several of the vaccines mentioned above, babies receive vaccines to protect them against five additional diseases around 1 year of age.

**Live, weakened viral vaccines: MMR and varicella** — Four of the five vaccines given at this age are live, weakened viral vaccines, including measles, mumps and rubella in the MMR vaccine, and varicella, more commonly known as chickenpox. This means that immunity is the result of the vaccine virus replicating after the vaccine is given. Because the vaccine virus has been grown in the laboratory, it does not replicate as efficiently. The result is development of a robust immune response without actually being ill.

Because these vaccines rely on viral replication, the timing for their receipt has been carefully determined. Like threading a needle, public health officials have to, on one hand, protect babies before they are likely to be exposed, while on the other hand, delay vaccination until maternal antibodies are less likely to interfere with the development of immunity. This balance is one of the reasons healthcare providers were so scared during the recent measles outbreaks. They understand just how vulnerable their patients less than 1 year old are. Measles is one of — if not the most — contagious of infectious diseases, making it very adept at finding the non-immune among us.

Of the viral infections, chickenpox presents its own conundrum. While this virus was never the killer that measles was, it still killed about 50 children every year in the U.S. before a vaccine was developed. While widespread vaccination can help stem transmission of this disease, the reality is that most adults have the virus living in nerve cells, having had chickenpox as children. The result is that the virus has a natural reservoir for survival and can re-emerge at any point.

Experience has shown that people who received the chickenpox vaccine are less likely to develop shingles as adults. And if they do, their cases are less severe because the virus that is reactivating is the vaccine strain, which is less damaging.

**Hepatitis A** — This infection is similar to hepatitis B in that it infects the liver, but it differs in how it is transmitted. Specifically, hepatitis A virus is transmitted primarily through contaminated food and water. Historically in the U.S., the virus was most often associated with contaminated food or food handlers, such as at restaurants. More recently, the virus has been spreading from person to person among those who are homeless and those abusing drugs, specifically as a result of the opioid epidemic.

Parents may wonder, then, why their babies should get this vaccine. Unfortunately, when babies and young children are infected with hepatitis A, they often do not have symptoms. While that may seem like a good thing, it is not ideal for a few reasons. From an individual standpoint, families do not know the child is infected, so the child can be chronically infected with the result being liver hepatitis A, they often do not have symptoms. While that may seem like a good thing, it is not ideal for a few reasons. From a public health standpoint, not knowing the child is infected means that they can unwittingly spread the disease to others.

**Influenza vaccine** — Depending on when a baby is born, the influenza vaccine may be offered at the six-month or one-year visit. The first time a baby gets this vaccine, two doses, separated by four weeks, are necessary to allow the immune system to generate protective immunity. Although the vaccine is not always a perfect match to circulating strains of the virus, some immunity is better than none.

Influenza is a respiratory illness, and every year, babies and young children are hospitalized with influenza. Sadly, every year, some die from their infections. One of the most important points about influenza is that when it infects a person, it makes the respiratory tract particularly susceptible to other potentially severe infections. For this reason, vaccinating against influenza may also indirectly protect against secondary respiratory illnesses as well.

**In summary**

Today, we don’t see many of the diseases against which vaccine protect, so we may be lulled into the comfortable notion that they are not present. But, they are still present, and they wait for opportunities to make themselves known. So, while the immunization schedule can seem daunting, it is set up as it is quite intentionally — to position babies against potential attacks. Knowing this, maybe the question should be, “How can I not give my baby all doses of these vaccines before 24 months of age?”