

# Rotavirus: Questions and Answers

## INFORMATION ABOUT THE DISEASE AND VACCINES

### What causes rotavirus disease?

Rotavirus disease is caused by a virus, the rotavirus. The name rotavirus is derived from the Latin *rota*, meaning “wheel,” because the rotavirus has a wheel-like appearance when viewed by an electron microscope.

### How does rotavirus spread?

The rotavirus enters the body through the mouth and then infects the lining of the intestines. Rotavirus is very contagious, spreading easily from children who are already infected to other children and sometimes adults. Large amounts of rotavirus are shed in the stool of infected people and the virus can be easily spread via contaminated hands and objects, such as toys. Children can spread rotavirus both before and after they become sick with diarrhea. Rotavirus is very stable and may remain viable in the environment for months if not disinfected.

### How long does it take to show signs of rotavirus after being exposed?

The incubation period for rotavirus diarrhea is 1 to 3 days. Symptoms of infection vary and depend on whether it is the first infection or a repeat infection.

### What are the symptoms of rotavirus?

In young children, rotavirus disease commonly begins with fever and vomiting, followed by diarrhea. Vomiting and diarrhea may last from three to seven days. The diarrhea may be watery and may lead to dehydration.

### How serious is rotavirus?

All three symptoms of rotavirus disease (fever, vomiting, and diarrhea) cause children to lose fluids. Vomiting is especially dangerous because it's difficult to replace fluids in children who are vomiting persistently.

Prior to the availability of rotavirus vaccine, rotavirus infection was responsible for more than 400,000 doctor visits, more than 200,000 emergency room

visits, 55,000 to 70,000 hospitalizations, and 20 to 60 deaths in the United States each year. In the first five years of life, four of five children in the United States would develop rotavirus gastroenteritis, one in seven would require a clinic or emergency room visit, one in 70 would be hospitalized, and one in 200,000 would die from this disease.

In developing countries, rotavirus causes more than 500,000 deaths each year in children younger than age five years.

### What are possible complications from rotavirus?

Rotavirus infection in infants and young children can lead to severe diarrhea and dehydration. The dehydration may be severe. Immunodeficient children may have more severe or persistent disease.

### How do I know if my child has rotavirus?

Rotavirus disease is difficult to differentiate from diarrheal illness caused by other pathogens. As a result, laboratory testing of the stool is needed to confirm a diarrheal illness as rotavirus disease.

### Is there a treatment for rotavirus?

Children are typically treated by replacing lost body fluids through drinking liquids specifically made for rehydration; these liquids are called oral rehydration solutions. These products contain specific amounts of water, sugars, and salts. In severe cases, body fluids are replaced with fluids given directly through the veins by use of an intravenous line in the hospital.

### How long is a person with rotavirus contagious?

Infected persons shed large quantities of virus in their stool beginning 2 days before the onset of diarrhea and for up to 10 days after onset of symptoms. Rotavirus may be detected in the stool of persons with immune deficiency for more than 30 days after infection.

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**Can you get rotavirus more than once?**

A person may develop rotavirus disease more than once because there are many different rotavirus types, but second infections tend to be less severe than the first infections. After a single natural infection, 40% of children are protected against a subsequent rotavirus illness. Persons of all ages can get repeated rotavirus infections, but symptoms may be mild or not occur at all in repeat infections.

**Wouldn't good hygiene be enough to prevent rotavirus disease?**

Better hygiene and sanitation have not been very effective in reducing rotavirus disease. This is illustrated by the fact that virtually everyone in the world is infected by rotavirus disease by age five years, despite differences in sanitation between countries.

**Can adults be infected with rotavirus?**

Yes. Rotavirus infection of adults is usually asymptomatic but may cause diarrheal illness. Outbreaks of diarrheal illness caused by rotavirus have been reported, especially among elderly persons living in retirement communities.

**When did a rotavirus vaccine become available?**

A vaccine to prevent rotavirus gastroenteritis was first licensed in 1998 but was withdrawn in 1999 because of its association with an uncommon type of bowel obstruction called "intussusception."

In 2006, the U.S. Food and Drug Administration (FDA) approved a new rotavirus vaccine, RotaTeq (by Merck). In 2008, FDA approved a second rotavirus vaccine, Rotarix (by GlaxoSmithKline).

**What kind of vaccine are they?**

RotaTeq and Rotarix are both live attenuated (weakened) viral vaccines.

**How is this vaccine given?**

Both RotaTeq and Rotarix are given to babies orally.

**Who should get this vaccine?**

National experts on immunization (such as the

Centers for Disease Control and Prevention and the American Academy of Pediatrics) recommend routine vaccination of all infants with rotavirus vaccine.

**What is the recommended schedule for getting this vaccine?**

Both vaccines require multiple doses. RotaTeq vaccine is given in a 3-dose series with doses at ages 2, 4, and 6 months; Rotarix vaccine is given in a 2-dose series with doses at ages 2 and 4 months.

The first dose of either vaccine can be given as early as age 6 weeks or as late as age 14 weeks, 6 days. Vaccination should not be started for infants once they reach their 15 week birthday. There must be at least 4 weeks between doses and all doses must be given by age 8 months. Rotavirus vaccine may be given at the same time as other childhood vaccines.

**Should an infant who has already been infected with rotavirus still be vaccinated?**

Yes. Infants who have recovered from a rotavirus infection may not be immune to all of the virus types present in the vaccine. So infants who have previously had rotavirus disease should still complete the vaccine series if they can do so by age 8 months.

**How safe is this vaccine?**

Before being licensed by the Food and Drug Administration both rotavirus vaccines were studied in clinical trials involving more than 60,000 infants. Adverse reactions reported among vaccinated infants in the trials included vomiting, diarrhea, irritability and fever. However, children who received a placebo developed the same symptoms at a similar rate. No serious adverse reactions were identified in the prelicensure trials.

The prelicensure clinical trials of both RotaTeq and Rotarix did not find an increased risk for intussusception (a type of bowel obstruction) among vaccine recipients. A large postlicensure study of more than 1.2 million rotavirus vaccine recipients found a very small increased risk of intussusception (1 to 1.5 additional cases of intussusception per 100,000 vaccinated infants) in the 7 to 21 days following the first dose. No increased risk of intussusception was

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found after the second or third doses. A study conducted by the CDC Vaccine Safety Datalink found no increased risk of intussusception following RotaTeq but found an increased risk following the first and second doses of Rotarix. Based on this study, one case of intussusception would be expected for approximately each 20,000 children, who are fully vaccinated.

CDC and the Food and Drug Administration (FDA) continue to believe that the benefits of rotavirus vaccination outweigh the risks associated with vaccination and that routine vaccination of infants should continue.

### **How effective is rotavirus vaccine?**

Rotavirus vaccine is very effective against rotavirus disease. Studies show the vaccine to be highly effective (85% to 98%) against severe rotavirus disease and effective against rotavirus disease of any severity (74% to 87%) through approximately the first rotavirus season after vaccination. Chances that children will need to be hospitalized for rotavirus disease are also greatly decreased (96%) by the vaccine. Neither vaccine will prevent diarrhea or vomiting caused by other germs.

### **Who should not receive rotavirus vaccine?**

Any child who has had a severe (life-threatening) allergic reaction to a previous dose of rotavirus vac-

cine should not get another dose. A child with a severe (life-threatening) allergy to any component of rotavirus vaccine should not get the vaccine. Because the oral applicator for Rotarix contains latex rubber, infants with a severe (anaphylactic) allergy to latex should not be given Rotarix; the RotaTeq dosing tube is latex-free. Rotavirus vaccine should not be given to an infant diagnosed with the rare genetic disorder severe combined immune deficiency (SCID). Infants who have had intussusception are more likely to develop it again compared to infants who have never had intussusception. As noted above the first dose of rotavirus vaccine has been associated with a small increased risk of intussusception (1 to 1.5 cases per 100,000 first doses). So rotavirus vaccine should not be given to an infant with a previous history of intussusception.

Children who are moderately or severely ill at the time the vaccination is scheduled should probably wait until they recover, including children who are experiencing diarrhea or vomiting. Healthcare providers will decide on a case-by-case basis whether to vaccinate a child with an ongoing digestive problem, an immune system weakened because of HIV/AIDS or another disease that affects the immune system, or a child who is receiving treatment with drugs such as long-term steroids or treatment for cancer.