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# Adenovirus

## About Adenovirus Infections

Adenoviruses are a group of viruses that can infect the membranes (tissue linings) of the respiratory tract, eyes, intestines, and urinary tract. They account for about 10% of acute respiratory infections in kids and are a frequent cause of diarrhea.

Adenoviral infections affect babies and young children much more often than adults. Childcare centers and schools sometimes have multiple cases of respiratory infections and diarrhea caused by adenovirus.

Adenoviral infections can occur at any time of the year, but:

- respiratory tract problems caused by adenovirus are more common in late winter, spring, and early summer
- conjunctivitis (pinkeye) and pharyngoconjunctival fever caused by adenovirus tend to affect older kids, mostly in the summer

Adenoviral infections can affect children of any age, but most occur in the first years of life — and most kids have had at least one before age 10. There are many different types of adenoviruses, so some kids can have repeated adenoviral infections.

## Signs and Symptoms

Depending on which part of the body is affected, the signs and symptoms of adenoviral infections vary:

**Febrile respiratory disease**, an infection with fever of the respiratory tract, is the most common result of adenoviral infection in kids. The illness often appears flu-like and can include symptoms of pharyngitis (inflammation of the pharynx, or sore throat), rhinitis (inflammation of nasal membranes, or a congested, runny nose), cough, and swollen lymph nodes (glands). Sometimes the respiratory infection leads to acute otitis media, an infection of the middle ear.

Adenovirus often affects the lower respiratory tract as well, causing bronchiolitis, croup, or viral pneumonia, which is less common but can cause serious illness in infants. Adenovirus

can also produce a dry, harsh cough that can resemble whooping cough (pertussis).

**Gastroenteritis** is an inflammation of the stomach and the small and large intestines. Symptoms include watery diarrhea, vomiting, headache, fever, and abdominal cramps.

**Genitourinary infections: Urinary tract infections** can cause frequent urination, burning, pain, and blood in the urine. Adenoviruses are also known to cause a condition called **hemorrhagic cystitis**, which is characterized by blood in the urine. Hemorrhagic cystitis usually resolves on its own.

### Eye infections:

- **Pinkeye (conjunctivitis)** is a mild inflammation of the conjunctiva (membranes that cover the eye and inner surfaces of the eyelids). Symptoms include red eyes, discharge, tearing, and the feeling that there's something in the eye.
- **Pharyngoconjunctival fever**, often seen in small outbreaks among school-age kids, occurs when adenovirus affects both the lining of the eye and the respiratory tract. Symptoms include very red eyes and a severe sore throat, sometimes accompanied by low-grade fever, rhinitis, and swollen lymph nodes.
- **Keratoconjunctivitis** is a more severe infection that involves both the conjunctiva and cornea (the transparent front part of the eye) in both eyes. This type of adenoviral infection is extremely contagious and occurs most often in older kids and young adults, causing red eyes, photophobia (discomfort of the eyes upon exposure to light), blurry vision, tearing, and pain.

## Contagiousness

Adenovirus is highly contagious, so multiple cases are common in close-contact settings like childcare centers, schools, hospitals, and summer camps.

The types of adenovirus that cause respiratory and intestinal infections spread from person to person through respiratory secretions (coughs or sneezes) or fecal contamination. Fecal material can spread via contaminated water, eating food contaminated by houseflies, and poor hand washing (such as after using the bathroom, before eating or preparing food, or after handling dirty diapers).

A child might also pick up the virus by holding hands or sharing a toy with an infected person. Adenovirus can survive on surfaces for long periods, so indirect transmission can occur through exposure to the contaminated surfaces of furniture and other objects.

The types of adenovirus causing pinkeye may be transmitted by water (in lakes and swimming pools), by sharing contaminated objects (such as towels or toys), or by touch.

Once a child is exposed to adenovirus, symptoms usually develop from 2 days to 2 weeks later.

## Treatment

Adenoviral illnesses often resemble certain bacterial infections, which can be treated with antibiotics. But antibiotics don't work against viruses. To diagnose the true cause of the symptoms so that proper treatment can be prescribed, your doctor may want to test

respiratory or conjunctival secretions, a stool specimen, or a blood or urine sample.

The doctor will decide on a course of action based on your child's condition. Adenoviral infections usually don't require hospitalization. However, babies and young children may not be able to drink enough fluids to replace what they lose during vomiting or diarrhea and so might need to be hospitalized to treat or prevent dehydration. Also, young (especially premature) infants with pneumonia usually need to be hospitalized.

In most cases, a child's body, with the help of the immune system, will get rid of the virus over time. Antibiotics cannot treat a viral infection, so it's best to just make your child more comfortable.

If your child has a respiratory infection or fever, getting plenty of rest and taking in extra fluids are essential. A cool-mist humidifier (vaporizer) may help loosen congestion and make your child more comfortable. Be sure to clean and dry the humidifier thoroughly each day to prevent bacterial or mold contamination. If your child is under 6 months old, you may need to clear his or her nose with nasal saline drops and a bulb syringe.

Don't give any over-the-counter (OTC) cold remedies or cough medicines without checking with your doctor. You can use acetaminophen to treat a fever (your doctor will tell you the proper dose); however, do **not** give aspirin because of the risk of Reye syndrome, a life-threatening illness.

If your child has diarrhea or is vomiting, increase fluid intake and check with the doctor about giving an oral rehydration solution to prevent dehydration.

To relieve the symptoms of pinkeye, use warm compresses and, if your doctor recommends them, a topical eye ointment or drops.

## Duration

Most adenoviral infections last from a few days to a week. However:

- severe respiratory infections may last longer and cause lingering symptoms, such as a cough
- pneumonia can last anywhere from 2-4 weeks
- pinkeye can persist for another several days to a week
- more severe keratoconjunctivitis can last for several weeks
- adenovirus can cause diarrhea that lasts up to 2 weeks (longer than other viral diarrhea episodes)

## Prevention

There's no way to completely prevent adenoviral infections in kids. To reduce their spread, parents and other caregivers should encourage frequent hand washing, keep shared surfaces (such as countertops and toys) clean, and remove kids with infections from group settings until symptoms pass.

## When to Call the Doctor

Most of these adenoviral conditions and their symptoms are also associated with other

causes. Call your doctor if:

- a fever continues more than a few days
- symptoms seem to get worse after a week
- your child has breathing problems
- your child is under 3 months old
- any swelling and redness around the eye becomes more severe or painful
- your child shows signs of dehydration, such as appearing tired or lacking energy, producing less urine or tears, or having a dry mouth or sunken eyes

Remember, you know your child best. If he or she appears to be severely ill, don't hesitate to call your doctor right away.

Reviewed by: Yamini Durani, MD

Date reviewed: July 2012



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Note: All information is for educational purposes only. For specific medical advice, diagnoses, and treatment, consult your doctor.