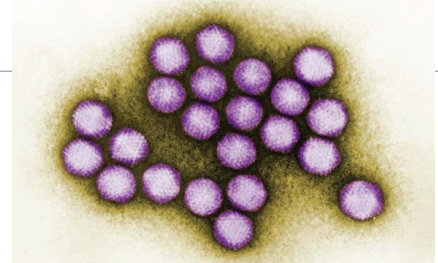


PATIENT EDUCATION | **INFORMATION SERIES**

Adenovirus Infection and Outbreaks: What You Need to Know

Adenovirus is a type of virus that can cause a variety of illnesses such as upper and lower respiratory infections, gastrointestinal infection, neurological infection, and eye infection. In some cases it is severe enough to even cause death.



An electron micrograph shows adenovirus particles. Photo courtesy US Centers for Disease Control and Prevention.

Outbreaks of adenovirus have become more common. Recent cases in 2018 have included clusters of people with infection in a college campus in Maryland, in a pediatric nursing facility and in an adult nursing rehabilitation center in New Jersey. Outbreaks occur across the world and can affect hundreds of people such as outbreaks reported from high school and military facilities in Asia.

What is adenovirus?

Adenovirus is actually a group of viruses that are a common cause of viral infections in all age groups. There are at least 40 distinct types of this virus.

Once you are exposed to adenovirus, usually the period before symptoms appear (incubation period) varies from 2 days to 2 weeks. Most people will have symptoms in 5-6 days after exposure. A person can also become ill from the virus already being in the body (latent infection) and becoming active again (re-activating).

How is adenovirus passed from person to person?

You can get infected with an adenovirus from either exposure to another person who has the virus or from touching a surface or object that is contaminated with the virus. You can breathe in virus in droplets in the air from a person who coughs or sneezes. You can get it from contact with a person's hands who have touched infected eyes (conjunctiva) or nose or cough mucus. A person with diarrhea can pass the virus on from contact with the stool. A person can get virus from touching surfaces or things a person with infection has coughed or sneezed on or touched. The virus can survive for up to 30 days on environmental surfaces.

This virus has also been reported in non-chlorinated water and has caused conjunctivitis (pink eye) due to swimming in such waters.

When do adenovirus infections occur and who is most at risk for infection?

Adenovirus infections can occur in any season but they tend to peak in the winter and early spring. Most adenovirus infections occur among young children (under 5 years of age). Adults who are in closed or crowded environments, such as in dormitories, military quarters, nursing homes, or hospitals are also at higher risk.

What are the symptoms of adenovirus infection?

The two most common organ systems affected by adenovirus are the respiratory and gastrointestinal (GI) tracts. Infections can appear as a "common cold" upper respiratory infection. One can also develop a lower respiratory infection such as bronchitis or pneumonia. Common symptoms include cough, fever, fast breathing, wheezing and sore throat. Adenovirus can also cause diarrhea, eye infections (conjunctivitis or pink eye) and even urinary tract infection. More rarely, it can be associated with liver (hepatitis), brain (encephalitis), and/or heart (myocarditis) problems.

Most infections are mild and go away without treatment (self-limited). Rarely, a person can have a severe illness that can result in respiratory and liver failure and death.

How are adenovirus infections diagnosed?

Adenovirus can be isolated by growing in cell cultures in a laboratory for several days. However, there are now rapid laboratory tests to diagnose adenoviral infection using nasal or throat swabs or sputum samples.

These tests use molecular based PCR and antigen detection to detect the presence of the virus without having to grow it. In severe cases, the virus can be detected in the blood. Chest x-rays may show signs of pneumonia but the findings are not specific for adenovirus.

How is adenovirus infection treated?

Many people with adenovirus infection do not require treatment due to the mild nature of symptoms. Supportive care may include control of nasal secretions with saline washes and suctioning. Breathing treatments may be helpful for some people with hypertonic saline or albuterol.

However, in some people, adenovirus can lead to severe disease and even death. People who have respiratory failure or severe GI symptoms, or people who have low immune function (immunocompromised) may need treatment with an antiviral medication such as cidofovir. Follow up lab viral testing can be used to monitor response to treatment.

Are there vaccines against adenovirus?

The US FDA has approved a vaccine against certain types of the virus (serotypes 4 and 7), which have been tied to outbreaks and severe cases), but it is only available for military use and is not currently available to the public.

How can adenovirus infection be prevented?

The first line of prevention is frequent hand washing (good hand hygiene). Avoid touching your eyes, nose and mouth with unwashed hands.

Disinfection of fomites [fo-mites] (clothes, utensils and furniture) is difficult as the virus is resistant to many disinfectants. Clean surfaces with heat or bleach-containing products.

People who have infection and are in the hospital need to be in isolation. You should try to avoid close contact with those who are sick. Anyone who is ill with the virus should stay home and avoid spreading the infection further. Virus shedding (released from the body) can continue for days to weeks even after the person recovers from the acute illness, therefore those who were infected can still spread to others even when they appear well.

Should cases of adenovirus infection be reported?

There are currently two tracking (surveillance) systems in the United States for adenoviral infections, which is done by clinical labs that provide the testing.

No additional reporting is required by the treating healthcare provider or person.

Authors: Charles S. Dela Cruz MD, PhD, Susan Pasnick, Jane E. Gross MD, PhD, Jon Keller, MD, W. Graham Carlos MD, Bin Cao, MD, Shazia Jamil MD
Reviewer: Marianna Sockrider MD, DrPH

Rx Action Steps

- ✓ If you suspect you have an adenovirus infection, stay home and avoid contact with others.
- ✓ Seek medical care if you have breathing problems or other severe symptoms.
- ✓ Use good handwashing to avoid infection.
- ✓ Clean all surfaces that may be in contact with infected droplets or touched by a person who is ill.

Healthcare Provider's Contact Number:

For More Information

American Thoracic Society

- www.thoracic.org/patients

Centers for Disease Control

- <https://www.cdc.gov/adenovirus/about/index.html>

American Academy of Pediatrics

- <https://www.healthychildren.org/English/health-issues/conditions/infections/Pages/Adenovirus-Infections.aspx>

Selected References

Kajon AE, et al. Adenovirus Type 4 Respiratory Infections among Civilian Adults, Northeastern United States, 2011–2015. *Emerg Infect Dis.* 2018 Feb;24(2):201-9.

Cao B., et al. Emergence of community-acquired adenovirus type 55 as a cause of community-onset pneumonia. *Chest.* 2014; 145(1):79-86.

Scott MK,, et al. Human Adenovirus Associated with Severe Respiratory Infection, Oregon, USA, 2013–2014. *Emerg Infect Dis.* 2016 June;22(6):1044-51.

Esposito, D.H., et al. Outbreak of pneumonia associated with emergent human adenovirus serotype 14—Southeast Alaska, 2008. *J Infect Dis.* 2010;202(2):214-22.

Ghebremedhin B. Human adenovirus: Viral pathogen with increasing importance. *Eur J Microbiol Immunol (Bp).* 2014;4(1):26-33.

This information is a public service of the American Thoracic Society. The content is for educational purposes only. It should not be used as a substitute for the medical advice of one's healthcare provider.

