CONDITION

Polio

Polio is a contagious viral infection that can rarely cause permanent muscle weakness or paralysis.

WHAT IT IS
Viral infection that can damage movement-controlling nerves

BODY SYSTEM
Nervous system and digestive tract

MAIN SYMPTOMS
Fever, headache, muscle pain, sudden weakness

WHAT CAUSES IT
Infection with poliovirus

HOW IT IS DIAGNOSED
Poliovirus testing of stool and throat samples

MAIN TREATMENT
Supportive care, breathing support, and rehabilitation

CAN IT BE CURED?
No - no antiviral cure available

IS IT AN EMERGENCY?
Sometimes - sudden weakness or breathing trouble

LONG-TERM OUTLOOK
Most infections resolve; paralysis may cause lifelong disability

Overview

Polio, short for poliomyelitis, is an infection caused by poliovirus. The virus mainly multiplies in the throat and intestines. In a small proportion of infections, it reaches the nervous system and damages the nerve cells that control muscles.

Most people infected with poliovirus have no symptoms. Others develop a short illness similar to flu. A much smaller number develop meningitis, meaning inflammation around the brain and spinal cord, or sudden muscle weakness and paralysis.

Paralysis means losing some or all ability to move a muscle. Polio-related paralysis is often uneven, affecting one limb more than another. It may be temporary or permanent. If the muscles used for breathing or swallowing are affected, the condition can become life-threatening.

Vaccination has removed naturally circulating polio from many parts of the world. However, poliovirus still circulates in some places and can be carried between countries. Maintaining vaccination remains important even where local cases are rare.

Symptoms

Most poliovirus infections cause no noticeable illness. A person without symptoms can still pass the virus to other people.

When symptoms occur, they may begin with a mild illness lasting a few days. Possible symptoms include:

Some people develop non-paralytic polio. This can cause meningitis without paralysis. Symptoms may include a severe headache, light sensitivity, neck stiffness, back pain, and painful muscle spasms.

Paralytic polio causes sudden weakness or loss of movement. The affected muscles may feel floppy rather than stiff. Weakness often affects the legs and may be more severe on one side. Sensation is usually preserved, so the person can often still feel touch or pain even when movement is limited.

Polio can also affect the muscles of the throat, face, chest, or diaphragm. The diaphragm is the main muscle used for breathing. Warning signs include difficulty swallowing, a weak voice, choking, shortness of breath, or an inability to cough strongly.

- Fever, tiredness, headache, or sore throat
- Nausea, vomiting, or stomach discomfort
- Muscle aches or stiffness
- Pain or stiffness in the neck, back, arms, or legs

Causes and risk factors

Polio is caused by poliovirus. It spreads mainly through the fecal-oral route. This means virus from an infected person's stool reaches another person's mouth, often through contaminated hands, food, water, or surfaces. It can also spread through droplets or saliva during close contact.

The virus can remain in the intestines and be passed in stool for several weeks. This allows transmission from people who have mild symptoms or no symptoms at all.

The main risk factor for paralytic polio is not being fully vaccinated. Exposure is more likely in places where poliovirus is circulating or where vaccination coverage is low. Travel, close household contact, poor sanitation, and some types of laboratory work may increase the chance of exposure.

There are two main types of polio vaccine. Inactivated polio vaccine, or IPV, is given by injection and cannot cause polio. Oral polio vaccine, or OPV, contains weakened live virus and is used in many vaccination programmes worldwide. In communities with low vaccination coverage, the weakened vaccine virus can rarely circulate long enough to change and cause outbreaks. These are called circulating vaccine-derived poliovirus outbreaks.

Diagnosis

Sudden floppy muscle weakness is treated as possible polio until testing finds another cause, especially if there may have been travel or exposure. Many other conditions can cause similar weakness, including Guillain-Barré syndrome, spinal cord inflammation, and certain infections.

Testing stool samples is the main way to confirm poliovirus infection. More than one sample may be needed because virus shedding can change over time. A throat swab may also detect the virus early in the illness.

Laboratories use methods such as polymerase chain reaction, or PCR, to identify poliovirus genetic material. Further genetic testing can show the virus type and help public health teams trace where it came from.

A lumbar puncture may be performed to examine cerebrospinal fluid, the liquid around the brain and spinal cord. This can show inflammation and help rule out other conditions, but spinal fluid testing alone usually does not confirm polio.

Blood tests, scans, nerve tests, and breathing measurements may be used to assess complications or consider other explanations for weakness. Suspected cases are reported promptly to public health authorities so that testing and steps to limit spread can begin.

Treatment and management

There is no antiviral treatment that removes poliovirus once infection has developed. Care focuses on supporting the body, preventing complications, and helping the person regain as much function as possible.

A mild illness may require rest, fluids, and appropriate treatment for pain or fever. More serious illness usually requires hospital care. Breathing, swallowing, heart rate, and blood pressure may

need close monitoring because the nerves controlling these functions can be affected.

If breathing muscles become weak, oxygen alone may not be enough. Mechanical ventilation may be needed to move air into and out of the lungs. Swallowing support can reduce the risk of food or liquid entering the airway.

During recovery, physical and occupational therapy can help maintain movement and support everyday activities. Treatment may include careful stretching, positioning, splints, braces, mobility aids, and exercises matched to the person's strength. Overworking severely weakened muscles can worsen pain and fatigue, so rehabilitation is usually gradual.

Long-term care may involve rehabilitation specialists, respiratory care, pain management, orthotics, and support for work or home adaptations. Surgery is sometimes considered for severe joint or bone problems caused by lasting muscle imbalance.

Complications

The main serious complication is permanent muscle weakness or paralysis. The effect depends on which nerve cells were damaged. Some people recover substantial movement, while others continue to need braces, walking aids, a wheelchair, or breathing support.

Weak swallowing muscles can allow food, drink, or saliva to enter the lungs. This is called aspiration and can lead to pneumonia. Weak breathing muscles can also make it harder to clear mucus or manage chest infections.

Long-term muscle imbalance may contribute to joint stiffness, shortened muscles called contractures, curved spine, limb deformity, pain, falls, or reduced bone strength. These problems can sometimes develop gradually as a child grows or as an adult ages.

Some survivors develop post-polio syndrome many years after the original infection. It can cause new muscle weakness, marked fatigue, muscle or joint pain, and reduced tolerance for activity or cold. It is not a new poliovirus infection, and it is not contagious.

Prevention

Polio can usually be prevented through vaccination. Completing the recommended polio vaccine series provides strong protection against paralytic polio. The exact schedule differs by country and by age.

People travelling to or working in areas where poliovirus is circulating may need to check whether their vaccinations are complete. Some fully vaccinated adults at increased risk may be

advised to have an additional booster under local guidance.

Handwashing, safe sanitation, and clean food and water reduce fecal-oral spread. These measures are helpful but do not replace vaccination because people without symptoms can still carry the virus.

Vaccination does not treat an infection that has already developed. When a case is suspected, public health teams may recommend testing, vaccination, or other measures for close contacts and the surrounding community.

Living with it and what to expect

People who have no symptoms or only a mild illness generally recover without lasting problems. Non-paralytic polio can cause significant pain and stiffness, but it does not produce the nerve damage responsible for paralysis.

When paralysis occurs, recovery is usually most noticeable during the first months. Strength may continue to improve more slowly over a longer period as surviving nerves and muscles adapt. It is not always possible to predict how much movement will return.

Permanent weakness does not necessarily prevent an active or independent life. Braces, mobility equipment, accessible environments, rehabilitation, and adjustments at school or work can reduce strain and support participation. Needs may change with growth, ageing, pregnancy, injury, or other health conditions.

Post-polio syndrome can appear decades after recovery. New weakness is usually gradual rather than sudden. Management often includes pacing activities, planned rest, suitable low-strain exercise, mobility support, pain care, and assessment of breathing or swallowing when needed.

Routine follow-up is useful for persistent weakness, falls, joint problems, breathing during sleep, swallowing difficulties, or changing equipment needs. New symptoms should not automatically be assumed to be post-polio syndrome because other treatable conditions can produce similar problems.

When to get medical help

Seek emergency help for:

Severe headache with fever, neck stiffness, vomiting, or light sensitivity also needs urgent medical assessment.

Prompt medical advice is appropriate after possible poliovirus exposure, particularly if vaccination is incomplete or recent travel involved an area with known circulation. Do not wait for paralysis to appear before reporting a significant exposure.

Arrange routine follow-up for long-standing weakness, increasing fatigue, repeated falls, new pain, reduced mobility, or gradual changes in breathing or swallowing. Sudden changes are not routine and need urgent assessment.

- Sudden weakness or inability to move an arm or leg
- Difficulty breathing, choking, or being unable to swallow
- A weak cough, bluish lips, confusion, or unusual drowsiness
- Rapidly worsening weakness, especially after fever or muscle pain

Common questions

Can polio be cured?

There is no medicine that cures established poliovirus infection or reverses nerve cells already destroyed by it. Supportive treatment can protect breathing and swallowing, while rehabilitation may improve strength, movement, and independence.

Is polio contagious?

Yes. Poliovirus spreads mainly when virus from stool reaches another person's mouth. People can pass it on even when they have no symptoms. Good sanitation helps, but vaccination is the main protection against paralytic polio.

Do people with polio always become paralysed?

No. Most infected people do not develop paralysis, and many have no symptoms at all. Paralysis happens only when the virus reaches and damages parts of the nervous system that control movement.

Can I get polio after being vaccinated?

Vaccination provides strong protection, especially against paralysis, but no vaccine gives absolute protection to every person. Risk is higher when the vaccine series is incomplete or when someone has a condition or treatment that weakens their immune response.

Can polio come back later in life?

The original infection does not normally reactivate. Some survivors develop post-polio syndrome decades later, with new fatigue, pain, or weakness. This is thought to relate to long-term strain on nerve and muscle units damaged by the earlier infection.

Can the polio vaccine give me polio?

The injected inactivated polio vaccine cannot cause polio. The oral vaccine contains weakened live virus. It very rarely contributes to vaccine-derived outbreaks when the virus circulates for a long time in an under-vaccinated community.

Sources

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