CONDITION

Cysticercosis

Cysticercosis is an infection caused by tapeworm larvae that form cysts in body tissues, sometimes including the brain.

WHAT IT IS
Tapeworm larval cysts in body tissues

BODY SYSTEM
Nervous system, eyes, muscles, and skin

MAIN SYMPTOMS
Seizures, headaches, confusion, muscle or skin lumps

WHAT CAUSES IT
Infection with Taenia solium tapeworm eggs

HOW IT IS DIAGNOSED
CT or MRI, antibody testing, sometimes biopsy

MAIN TREATMENT
Antiparasitic medicines, inflammation control, and symptom treatment

CAN IT BE CURED?
Sometimes - treatment can kill viable cysts

IS IT AN EMERGENCY?
Sometimes - with seizures or severe neurological symptoms

LONG-TERM OUTLOOK
Often manageable, but neurological effects may persist

Overview

Cysticercosis is an infection caused by the larval stage of Taenia solium , also called the pork tapeworm. It develops when someone swallows microscopic tapeworm eggs. The eggs hatch in the intestine, and the larvae travel through the body and form fluid-filled cysts.

Cysts can develop in muscles, under the skin, in the eyes, or elsewhere. When they form in the brain or spinal cord, the condition is called neurocysticercosis , the form most likely to cause serious symptoms.

Cysts may remain unnoticed for months or years. Symptoms often begin when a cyst breaks down and the immune system reacts, causing inflammation and swelling.

Cysticercosis is different from an adult intestinal tapeworm, called taeniasis. Eating

undercooked pork containing larvae can cause taeniasis. Cysticercosis occurs after swallowing tapeworm eggs , usually through food, water, hands, or surfaces contaminated with infected stool.

Symptoms

Many people with cysts in muscles or under the skin have no symptoms. Others notice small, firm lumps or occasional muscle pain and swelling.

Neurocysticercosis symptoms vary with the cysts' number, size, stage, and location. They may include:

Seizures are a common first sign. They may cause uncontrolled movements, staring, loss of awareness, unusual sensations, or confusion afterward.

Cysts can block the normal flow of cerebrospinal fluid around the brain and spinal cord, raising pressure inside the skull. Warning signs include worsening headache, repeated vomiting, increasing sleepiness, vision changes, or difficulty walking.

Eye cysts may cause blurred vision, pain, floating spots, or vision loss. Spinal cysts can cause back pain, weakness, numbness, or bladder and bowel problems, although this is less common.

- Seizures
- Headaches
- Nausea or vomiting
- Confusion, poor concentration, or behavior changes
- Problems with balance, walking, speech, or strength
- Vision changes
- Small lumps under the skin

Causes and risk factors

Cysticercosis begins when Taenia solium eggs enter the mouth. A person with an adult pork tapeworm releases eggs in their stool. Inadequate handwashing or sanitation can allow the eggs to contaminate food, water, surfaces, or another person's hands.

You do not develop cysticercosis simply by eating undercooked pork. Undercooked infected pork can cause an adult intestinal tapeworm. That person may then spread eggs or infect themselves through poor hand hygiene.

Risk is higher where the pork tapeworm is present and sanitation does not prevent human stool from contaminating food or water. The condition is more common in parts of Latin America, sub-Saharan Africa, and Asia, but it can be diagnosed anywhere.

Living with or receiving food from someone with an untreated intestinal pork tapeworm can increase exposure. The person may have no obvious symptoms. Cysticercosis does not spread through coughing, touching intact skin, or ordinary social contact; the eggs must be swallowed.

Diagnosis

Diagnosis considers symptoms, travel or residence history, and possible exposure to someone with a tapeworm. Symptoms may appear years after infection, so a lack of recent travel does not rule it out.

Brain imaging is central when neurocysticercosis is suspected. A CT scan is especially useful for detecting hardened, calcium-containing cysts. MRI can show cysts and swelling and may provide clearer images of certain parts of the brain.

Imaging may reveal living, breaking-down, or calcified cysts. Calcified cysts are dead parasites that have left calcium deposits. Their appearance and location help guide treatment.

Blood tests can detect antibodies to the parasite, but results must be interpreted with imaging and symptoms. Testing can be negative when only one cyst is present or when cysts are calcified.

An eye examination may be needed, particularly before antiparasitic treatment. Occasionally, a skin or muscle lump is removed and examined. Stool testing for an adult tapeworm may be considered for you or household members, but a negative result does not exclude cysticercosis.

Treatment and management

Treatment depends on where the cysts are, whether they are alive or calcified, and whether they cause swelling or block fluid flow. Care may involve specialists in infectious diseases, neurology, eye care, or brain surgery.

Antiparasitic medicines can kill viable larvae. However, dying cysts may trigger inflammation and temporarily worsen swelling or neurological symptoms. Treatment is therefore not started automatically in every case and is often combined with a corticosteroid like prednisone or hydrocortisone to reduce inflammation.

Calcified cysts contain no living parasites, so antiparasitic medicines do not remove them. Treatment instead focuses on symptoms and inflammation around the deposits.

Other treatments may include:

A shunt may be placed to drain excess brain fluid. Cysts in the brain's fluid spaces may sometimes be removed with a camera-guided procedure. Eye cysts may need removal before antiparasitic medicines are used because treatment-related inflammation inside the eye can damage vision.

Follow-up imaging may check whether viable cysts and swelling have resolved. If you have seizures, the length of anti-seizure treatment depends on repeat seizures, imaging findings, and your risk of another seizure.

- Anti-seizure medicine
- Corticosteroids for inflammation and swelling
- Medicines for headache or other symptoms
- Procedures to relieve blocked brain fluid
- Surgery or endoscopic removal for selected cysts
- Eye treatment when vision is threatened

Complications

Most complications involve cysts in the brain, spinal cord, or eyes. Risk depends on their location and the immune response as they break down.

Possible complications include epilepsy, meaning an ongoing tendency to have seizures. Some people have one seizure, while others need longer-term treatment. Even a dead, calcified cyst can be linked to nearby inflammation and repeat seizures.

A cyst may block fluid circulation around the brain, causing hydrocephalus. This buildup raises pressure inside the skull and may require a procedure or surgery.

Other complications include persistent headaches, memory or concentration problems, weakness, balance difficulties, stroke caused by inflammation around blood vessels, and vision damage. Imaging helps identify which problems need monitoring.

Prevention

Prevention focuses on stopping tapeworm eggs from reaching the mouth through reliable

sanitation, safe food and water, and treatment of people carrying an adult pork tapeworm.

Wash your hands with soap and safe water after using the toilet, after changing diapers, and before preparing or eating food. If safe water is unavailable, follow local public health advice about boiling or treating it.

Wash produce with safe water and use care with food prepared where sanitation is limited. Cooking pork thoroughly prevents intestinal pork tapeworm infection, although it does not address eggs spread through contaminated hands, food, or water.

If someone in a household has cysticercosis, clinicians or public health teams may consider checking close contacts for an intestinal tapeworm to identify and treat a possible source of eggs.

A person with cysticercosis does not usually spread it to others unless they also carry an adult intestinal tapeworm.

Living with it and what to expect

The course varies because cysts occur in different locations and stages. Skin or muscle cysts may cause few problems, while brain involvement usually needs closer follow-up.

Viable brain cysts may resolve after treatment or die naturally. Inflammation around a dying cyst often settles, but a calcified spot may remain visible on scans for life. Calcification does not mean the infection is still alive.

Some people have no further seizures after active inflammation resolves. Others continue to have seizures because of scarring, calcified lesions, or other factors. If anti-seizure medicine has been prescribed, do not stop it suddenly. Decisions about reducing it should be based on seizure history and follow-up findings.

Recovery from headaches, concentration problems, or weakness may take time. Rehabilitation, vision care, or help returning to work, school, or driving may be useful. Driving rules after a seizure vary by location.

Follow-up may include symptom reviews, management of medicine effects, seizure monitoring, and repeat imaging when it could change care. Keeping a record of seizures, headaches, vision changes, and medicines can help.

When to get medical help

Arrange a routine appointment for unexplained recurring headaches, new skin or muscle

lumps, or possible exposure to a pork tapeworm. Seek follow-up if symptoms return, medicines cause problems, or seizures are not well controlled.

Seek urgent medical care for new vision changes, increasing headaches, repeated vomiting, new weakness or numbness, worsening balance, or increasing confusion.

Call emergency services for:

During a seizure, protect the person from hazards, cushion their head, and turn them onto their side when possible. Do not restrain them or put anything in their mouth.

- A first seizure
- A seizure lasting five minutes or longer
- Repeated seizures without recovery between them
- Trouble breathing or an injury during a seizure
- Sudden severe weakness, speech difficulty, or loss of vision
- Severe headache with repeated vomiting, fainting, or marked drowsiness

Common questions

Can you get cysticercosis from eating pork?

Eating undercooked pork can cause an adult intestinal pork tapeworm, not cysticercosis directly. Cysticercosis develops after swallowing tapeworm eggs from contaminated hands, food, water, or surfaces.

Can cysticercosis be cured completely?

Sometimes. Treatment can kill viable cysts, but dead cysts may leave permanent calcified spots. Symptoms such as seizures can still require treatment after the parasite has died.

Is cysticercosis contagious?

Tissue cysts are not passed through ordinary contact. However, someone who also has an adult intestinal pork tapeworm can release eggs in stool and contaminate hands, food, or surfaces.

How long can cysticercosis stay in the body?

Cysts can remain for years before causing symptoms. Some eventually die and calcify, so diagnosis may occur long after the original exposure.

Can brain cysts be removed?

Some can, especially if they block brain fluid or are in accessible fluid spaces. Many are

managed with medicines. Treatment depends on location, stage, and effects on nearby tissue.

Do calcified brain cysts mean I still have an active infection?

Usually not. Calcification generally means the parasite is dead. The deposit may still be associated with inflammation or seizures that need ongoing management.

Sources

- Centers for Disease Control and Prevention. Clinical Overview of Cysticercosis . Parasites-Cysticercosis.
- Centers for Disease Control and Prevention. DPDx: Cysticercosis . Laboratory Identification of Parasites of Public Health Concern.
- World Health Organization. Taeniasis/cysticercosis . Fact sheet, 11 January 2022.
- White AC Jr, Coyle CM, Rajshekhar V, et al. Diagnosis and Treatment of Neurocysticercosis: 2017 Clinical Practice Guidelines by the Infectious Diseases Society of America and the American Society of Tropical Medicine and Hygiene . Clinical Infectious Diseases . 2018;66(8):e49-e75.
- Garcia HH, Nash TE, Del Brutto OH. Clinical symptoms, diagnosis, and treatment of neurocysticercosis . The Lancet Neurology . 2014;13(12):1202-1215.