CONDITION

Cryptococcosis

Cryptococcosis is a fungal infection that mainly affects the lungs or the brain and spinal cord.

WHAT IT IS
Infection caused by environmental Cryptococcus fungi

BODY SYSTEM
Lungs, brain, spinal cord, skin, and other organs

MAIN SYMPTOMS
Headache, fever, cough, shortness of breath

WHAT CAUSES IT
Fungal infection, usually breathed in

HOW IT IS DIAGNOSED
Antigen tests, fluid samples, cultures, and imaging

MAIN TREATMENT
Antifungal medicines and pressure management

CAN IT BE CURED?
Sometimes - treatment can clear active infection

IS IT AN EMERGENCY?
Sometimes - confusion, seizures, or severe breathing trouble

LONG-TERM OUTLOOK
Often treatable, but serious when infection reaches the brain

Overview

Cryptococcosis is an infection caused by _Cryptococcus_ fungi. They live in the environment, including soil, decaying wood, and material contaminated with bird droppings. Infection usually begins when fungal particles are breathed into the lungs.

Many people who inhale the fungus never become ill. In others, infection remains in the lungs or spreads through the blood to the brain, spinal cord, or other organs.

Infection of the lining around the brain and spinal cord is called cryptococcal meningitis. This serious form can raise pressure inside the skull and affect vision, hearing, thinking, or movement.

Cryptococcosis is especially important in people with weakened immune systems, including

those with advanced HIV, organ transplants, or immune-suppressing treatment. However, _Cryptococcus gattii_ can also cause illness in people without a known immune problem.

The infection is acquired from the environment and does not usually spread between people.

Symptoms

Symptoms depend on the infection site and the person's immune function. They may develop gradually over several weeks. Some lung infections cause no symptoms and are found on a chest scan.

A lung infection may cause:

Cryptococcal meningitis often causes a persistent or worsening headache. Other symptoms include fever, nausea, vomiting, sensitivity to light, blurred vision, unusual sleepiness, or changes in thinking or behaviour. A stiff neck may occur but can be absent, especially with weakened immunity.

Rising pressure inside the skull can cause blurred or double vision, hearing changes, confusion, weakness, difficulty walking, or seizures.

Infection elsewhere may cause skin bumps or sores, swollen joints, bone pain, or symptoms related to the affected organ. These symptoms have other possible causes and do not confirm cryptococcosis by themselves.

- Cough
- Chest discomfort
- Shortness of breath
- Fever
- Tiredness

Causes and risk factors

Cryptococcosis is caused mainly by _Cryptococcus neoformans_ or _Cryptococcus gattii_. The fungus usually enters through the lungs and may remain inactive until immune control weakens.

Contact with birds does not mean you will develop cryptococcosis. Infection comes from inhaling environmental particles rather than directly from a bird.

The risk of serious or widespread infection is higher with:

C. gattii is more likely than _C. neoformans_ to affect people who appear to have healthy immune systems. It may form larger areas of inflammation, called cryptococcomas, in the lungs or brain.

Some people have no recognised risk factor. Their care team may investigate for a condition affecting immunity.

- Advanced HIV, especially a very low CD4 count
- An organ or stem cell transplant
- Corticosteroids or other immune-suppressing medicines
- Certain blood cancers or immune conditions
- Treatments that affect specific parts of the immune system
- Severe liver or kidney illness

Diagnosis

Symptoms alone cannot confirm cryptococcosis. Diagnosis involves finding evidence of the fungus in blood, spinal fluid, lung mucus, tissue, or another body fluid.

A cryptococcal antigen test detects a substance released by the fungus. It can be performed on blood or cerebrospinal fluid, which surrounds the brain and spinal cord. A fungal culture may identify the organism but can take longer.

If meningitis is possible, a lumbar puncture is usually important. A needle is placed in the lower back to collect spinal fluid. The opening pressure is measured because cryptococcal meningitis can cause dangerously high pressure even when a scan does not show swelling.

A brain scan may be needed, particularly with seizures, reduced alertness, weakness, or concern about a mass. Chest X-rays or CT scans can show lung nodules or inflammation.

Further tests may check whether infection has spread and identify factors affecting immunity. HIV testing is commonly offered when HIV status is unknown.

Treatment and management

Treatment depends on whether infection is limited to the lungs, has reached the brain or blood, and whether immunity is weakened.

Cryptococcal meningitis and widespread infection usually require hospital treatment. Initial therapy commonly combines a medicine related to amphotericin B with flucytosine. This is

followed by fluconazole or another antifungal for several months. Longer suppressive treatment may be needed if the immune system remains weak.

A mild lung infection may be treated with an oral antifungal. Severe lung infection is generally treated like meningitis or widespread infection. Surgery is occasionally considered for a large cryptococcoma or another lesion causing pressure or not responding adequately to medicine.

Managing pressure around the brain is a major part of meningitis care. Repeated lumbar punctures may be needed to remove spinal fluid and lower pressure. Antifungal medicines alone may not correct it quickly.

Treatment requires monitoring. Amphotericin products can affect kidney function and mineral levels such as potassium. Flucytosine can affect blood cell production, while azole antifungals can affect the liver and interact with other medicines. Blood tests and medicine reviews help manage these risks.

People with HIV also need effective HIV treatment. In cryptococcal meningitis, clinicians carefully plan when to start or restart antiretroviral therapy because beginning too soon can trigger harmful inflammation called immune reconstitution inflammatory syndrome, or IRIS.

Immune-suppressing treatment may need adjustment. Sudden changes can cause rejection, inflammation, or worsening of another condition, so do not stop these medicines without specialist guidance.

Complications

Cryptococcal meningitis may cause persistently raised pressure inside the skull. Without adequate pressure control, this can damage the optic nerves, reduce vision, affect hearing, or alter consciousness.

Other possible complications include:

A cryptococcoma may press on brain tissue or block the normal movement of spinal fluid. In the lungs, nodules may be mistaken for another condition until laboratory testing is completed.

Symptoms can worsen after treatment begins because of IRIS or another inflammatory response. This does not always mean treatment has failed. Repeat tests may distinguish inflammation from persistent or returning infection.

- Stroke-like injury from inflammation around brain blood vessels
- Seizures or lasting memory and concentration problems
- Lung damage or severe breathing difficulty

- Infection in bones, skin, the prostate, or other organs
- Infection returning after treatment

Prevention

There is no vaccine, and environmental exposure cannot be prevented completely. _Cryptococcus_ can occur in ordinary soil and plant material.

If your immune system is severely weakened, avoid activities that create heavy dust from bird droppings, decaying wood, or contaminated soil where possible. This may reduce exposure but cannot guarantee prevention.

For people living with HIV, effective antiretroviral treatment restores immune function and greatly lowers the risk of serious cryptococcosis. In advanced HIV, clinicians may use a blood cryptococcal antigen test to find early infection before meningitis develops, depending on local guidance.

Take immune-suppressing medicines as directed and attend planned tests and reviews. Do not reduce or stop them solely because of concern about cryptococcosis.

Because the infection is not normally passed between people, isolation from family, friends, or coworkers is not usually needed.

Living with it and what to expect

Treatment often lasts for months. The first phase may involve hospital care, intravenous medicine, repeated lumbar punctures, and frequent blood tests. Once stable, treatment may continue at home with oral medicine and scheduled follow-up.

Headaches and other symptoms may improve gradually. Vision, hearing, balance, memory, or energy can take longer to recover, and some effects of severe meningitis may remain.

The outlook is better when infection is found early, pressure around the brain is controlled, and the underlying immune problem improves. Widespread infection and advanced immune suppression make recovery less certain. Relapse is more likely if treatment stops early or immune function remains poor.

Follow-up may include blood tests, medicine monitoring, eye or hearing assessment, and repeat imaging or spinal fluid tests. Antigen tests can remain positive for some time, so results are interpreted alongside symptoms, cultures, and other findings.

Return to work, study, exercise, and driving depends on recovery, medicine effects, and

whether there have been seizures or changes in vision or thinking.

When to get medical help

Arrange prompt medical assessment for a new persistent headache, fever, cough, shortness of breath, or unexplained skin lesions if you have advanced HIV, a transplant, or substantial immune suppression.

If you are being treated for cryptococcosis, contact your care team promptly if symptoms return or worsen. Report increasing headache, repeated vomiting, new visual or hearing changes, worsening cough, reduced urine output, yellowing of the skin or eyes, or difficulty taking prescribed medicine.

Seek emergency help for:

Continue routine follow-up even when you feel better. It is needed to monitor treatment effects, immune recovery, and recurrence.

- A seizure
- New confusion, collapse, or difficulty waking
- Severe or rapidly worsening breathing difficulty
- Sudden weakness, loss of speech, or major vision loss
- A severe headache with repeated vomiting or reduced alertness

Common questions

Is cryptococcosis contagious?

Usually not. People generally acquire it by inhaling fungal particles from the environment. It does not normally spread through coughing, touching, sex, shared food, or ordinary household contact.

Can a healthy person get cryptococcosis?

Yes, although serious infection is more common with weakened immunity. _C. gattii_ can cause lung or brain infection without a known immune condition.

Can cryptococcosis be cured completely?

Antifungal treatment can often clear active infection. Some people need long-term suppressive medicine because their immune system cannot yet control the fungus. Severe brain infection may leave lasting effects.

How long does cryptococcosis treatment take?

Treatment commonly lasts several months and has different phases. Duration depends on the infection site, response, culture results, immune function, and complications.

Can cryptococcosis come back?

Yes. Recurrence is more likely if treatment is incomplete, the fungus is not fully controlled, or severe immune suppression continues. Taking treatment as planned and attending follow-up lowers this risk.

Do bird droppings cause cryptococcosis?

The fungus can grow in soil or material contaminated with bird droppings, especially pigeon droppings. Infection happens by inhaling environmental particles, not usually through direct contact with a bird.

Sources

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- Centers for Disease Control and Prevention: Clinical Overview of Cryptococcosis
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- World Health Organization: Guidelines for diagnosing, preventing and managing cryptococcal disease among adults, adolescents and children living with HIV, 2022
- Chang CC and colleagues: Global guideline for the diagnosis and management of cryptococcosis, _The Lancet Infectious Diseases_, 2024 00731-4)