CONDITION

# Secondary infections

A secondary infection is an infection that develops during or after another illness or disruption of the body's normal defenses.

**WHAT IT IS**
Infection developing during or after another health problem

**BODY SYSTEM**
Any body system, often lungs, skin, or urinary tract

**MAIN SYMPTOMS**
Fever returning, worsening pain, new discharge, breathing problems

**WHAT CAUSES IT**
Microbes exploiting damaged tissue or weakened immune defenses

**HOW IT IS DIAGNOSED**
Examination, site-specific cultures, molecular tests, or imaging

**MAIN TREATMENT**
Treatment targeted to the responsible microbe and infection site

**CAN IT BE CURED?**
Sometimes - many clear with targeted treatment

**IS IT AN EMERGENCY?**
Sometimes - severe breathing trouble or confusion needs emergency care

**LONG-TERM OUTLOOK**
Most resolve; severe or recurrent infections may cause lasting harm

## Overview

A secondary infection is an infection that develops during or after another illness, injury, or treatment. The first problem may damage tissue, disturb the body's normal mix of microbes, or weaken immune defenses. This can create an opportunity for a different microbe to cause infection.

For example, influenza can damage the airways and sometimes be followed by bacterial pneumonia. Broken or inflamed skin can become infected with bacteria. Antibiotics like amoxicillin or doxycycline may disturb the normal bacteria in the gut or vagina, allowing other organisms to grow.

Secondary infections can be caused by bacteria, viruses, fungi, or parasites. They may affect the same part of the body as the first illness or develop somewhere else.

The term does not mean that the infection is mild. Some secondary infections are small and respond well to treatment. Others, such as pneumonia or an infection that spreads into the bloodstream, can become serious.

A secondary infection is not the same as a coinfection , in which two infections are present at the same time from the start. It also differs slightly from an opportunistic infection , which is caused by a microbe taking advantage of weakened immune defenses. An opportunistic infection can be a type of secondary infection.

## Symptoms

Symptoms depend on the body part involved and the type of microbe. One useful pattern is that the original illness starts to improve, but symptoms then return or become worse. However, this pattern alone cannot confirm a secondary infection.

Possible signs include:

Babies, older adults, and people with weakened immune systems may not develop a clear fever. Changes such as confusion, unusual sleepiness, poor feeding, or a sudden decline in daily function can be important.

Yellow or green mucus does not, by itself, prove that a bacterial infection is present. Viral illnesses can also change the color and thickness of mucus. Testing and the overall pattern of symptoms may be needed.

- Fever that begins again after settling
- New or worsening pain, swelling, warmth, or redness
- Pus, drainage, an unpleasant smell, or a wound that is not healing
- A cough that becomes worse, chest pain, or shortness of breath
- New ear pain or fluid coming from an ear
- Pain or burning when urinating
- Frequent watery diarrhea, especially during or after antibiotic use
- White patches in the mouth or new vaginal itching and discharge
- Unusual tiredness, poor appetite, or reduced activity

## Causes and risk factors

A secondary infection happens when a microbe gets past defenses that would usually control it.

A respiratory virus can damage the lining of the nose, throat, or lungs. Scratching eczema can break the skin barrier. Surgery, burns, wounds, intravenous lines, or urinary catheters can provide a route into the body. Some medicines and health conditions reduce the immune system's ability to respond.

Antibiotics can also change the normal community of microbes living in the body. This may allow organisms such as yeast or Clostridioides difficile , often called C. diff , to multiply. Antibiotics do not prevent every secondary infection and can sometimes contribute to one.

Factors that can increase risk include:

Having a risk factor does not mean that you will develop an infection. Secondary infections can also occur in people without a known risk factor.

- A recent viral infection, especially one affecting the lungs
- Open wounds, burns, surgery, or inflamed skin
- Medical devices such as catheters or intravenous lines
- Medicines that suppress the immune system
- Cancer treatment, an organ transplant, or advanced HIV infection
- Poorly controlled diabetes or serious long-term illness
- A prolonged hospital stay
- Recent antibiotic treatment

## Diagnosis

There is no single test for all secondary infections. Assessment begins with the timing and pattern of symptoms, the first illness or injury, recent treatments, and any factors affecting the immune system.

A healthcare professional may examine the affected area and check temperature, breathing, heart rate, blood pressure, and alertness. The tests used depend on where the infection may be.

A sample may be taken from blood, urine, sputum, stool, a wound, or another body fluid. A culture tries to grow the microbe in a laboratory. A molecular test , such as PCR, looks for genetic material from a virus, bacterium, or fungus. Some tests can also help show which medicines are likely to work.

Blood tests may look for inflammation, changes in blood cells, or effects on organs. A chest X-ray or other imaging may be used when pneumonia, an abscess, or a deeper infection is suspected.

Finding a microbe does not always mean it is causing disease. Some organisms normally live on the skin or in the body. Test results need to be considered alongside symptoms and examination findings.

When someone is seriously unwell, treatment may need to begin before all results are available. Samples are often collected first when this can be done without delaying urgent care.

## Treatment and management

Treatment is based on the infection site, likely cause, severity, test results, and the person's general health.

Bacterial infections may be treated with antibiotics. Fungal infections need antifungal medicines, while some viral infections may be treated with antivirals like acyclovir or oseltamivir . Antibiotics do not treat viruses or fungi.

If a pocket of pus, called an abscess, has formed, medicine alone may not be enough. It may need to be drained. An infected medical device may need to be removed or replaced. Wounds may require cleaning and appropriate dressings.

Supportive care can include fluids, rest, pain relief, oxygen, or treatment for fever. Severe infections may require hospital care and medicines given into a vein.

If tests identify the microbe, treatment may be changed to a more targeted medicine. This helps treat the infection while limiting unnecessary exposure to broad-acting antibiotics.

Take prescribed infection treatment exactly as directed. Do not use leftover antibiotics or another person's medicine. Contact the prescribing service if side effects are difficult to manage, doses are missed, or symptoms are worsening. Do not stop a prescribed course early unless a healthcare professional tells you to do so.

The first illness or underlying problem may also need treatment. This could include caring for damaged skin, improving diabetes control, or reviewing medicines that affect immunity. Immune-suppressing medicine should not be stopped without medical advice, because stopping suddenly may be harmful.

## Complications

Many secondary infections remain limited to one area and clear with appropriate care. Complications are more likely when an infection is severe, treatment is delayed, the microbe resists usual medicines, or immune defenses are weak.

An infection may spread into nearby tissue, bone, or the bloodstream. It may form an abscess or interfere with the function of the lungs, kidneys, brain, or another organ.

Sepsis is the body's dangerous, extreme response to an infection. It can lead to organ damage and requires emergency treatment. Any infection can potentially cause sepsis, although most do not.

Repeated infections can also affect quality of life and may point to an ongoing issue, such as damaged tissue, an untreated source of infection, or reduced immune function. Repeated antibiotic exposure can promote antibiotic resistance, meaning bacteria become harder to treat.

## Prevention

Secondary infections cannot always be prevented. Some develop even when the first illness has been managed appropriately.

Vaccination can reduce the chance or severity of some infections that may lead to complications. This includes vaccines against illnesses such as influenza, COVID-19, chickenpox, and pneumococcal disease when they are recommended for your age or health situation.

Practical steps include:

Some people at high risk are prescribed medicine to prevent particular infections. This is used only in specific circumstances, such as certain cancer treatments, transplants, or advanced immune suppression.

- Wash your hands regularly and avoid sharing personal care items
- Clean and cover cuts according to wound-care instructions
- Try not to scratch eczema, bites, or healing wounds
- Follow instructions for catheters, intravenous lines, or surgical wounds
- Use antibiotics only when prescribed for you
- Keep recommended follow-up if you take immune-suppressing medicine
- Avoid close contact with others when you have a contagious infection

## Living with it and what to expect

The course depends on the infection site, the microbe, how quickly treatment begins, and your underlying health. A small skin infection and severe pneumonia will not follow the same path.

Many secondary infections improve once the correct treatment is started and any source, such as an abscess or infected device, is managed. Tiredness, cough, reduced appetite, or discomfort can last longer than the active infection, especially after pneumonia or a hospital stay.

Symptoms that are not improving as expected need review. This may mean the microbe is resistant to the first medicine, the infection needs drainage, the diagnosis is different, or another health problem is slowing recovery. Routine follow-up may include checking a wound, reviewing test results, or confirming that organ function has recovered.

Recurrent secondary infections are not always a sign of a serious immune disorder. Common explanations include ongoing skin damage, repeated exposure, a medical device, or a structural problem such as blocked drainage. A pattern of frequent, unusual, deep, or difficult-to-treat infections may lead to further testing.

After a severe infection, recovery can take weeks or longer. Activity may need to increase gradually. Some people have lasting effects from tissue or organ damage, but this is not the usual outcome of a minor, localized infection.

## When to get medical help

Arrange prompt medical assessment if symptoms improve and then clearly worsen, or if you develop a new fever, increasing pain, spreading redness, pus, breathing symptoms, or signs of dehydration.

Contact a healthcare service promptly if you have possible infection symptoms and a weakened immune system, are receiving cancer treatment, have recently had surgery, or have an implanted medical device. Fever in a baby younger than 3 months also needs urgent medical assessment.

Seek urgent or emergency help for:

These symptoms can occur with sepsis or another serious problem. Use your local emergency number rather than waiting for a routine appointment.

- Severe difficulty breathing, gasping, or blue or grey lips
- New confusion, collapse, or difficulty waking

- A seizure or a stiff neck with severe illness
- Very little or no urine, severe weakness, or cold, blotchy skin
- Rapidly spreading skin discoloration or severe pain out of proportion
- Signs of a severe allergic reaction after medicine, such as facial swelling or breathing difficulty

## Common questions

How do I know if a viral infection has turned bacterial?

Symptoms that return after improvement, a new fever, worsening breathing, or pain focused in one area can raise concern. They do not prove that bacteria are responsible. An examination and sometimes laboratory testing or imaging are needed.

Does a secondary infection always need antibiotics?

No. Antibiotics work only against bacteria. A fungal infection needs antifungal treatment, and many viral infections improve without specific medicine. Some localized infections also need drainage or wound care.

Is a secondary infection contagious?

It can be, but not always. Contagiousness depends on the microbe rather than the label "secondary." A bacterial skin infection, respiratory virus, or diarrheal infection may spread, while an infection inside a closed wound may not spread through ordinary contact.

Can I get a secondary infection while taking antibiotics?

Yes. An antibiotic may not act against the responsible bacterium, or the infection may be caused by a virus or fungus. Antibiotics can also disturb normal microbes and contribute to yeast infection or C. diff infection.

How long does a secondary infection last?

A small, uncomplicated infection may improve soon after effective treatment begins. Deep infections, pneumonia, bone infections, and infections in people with reduced immunity often take longer. Persistent fever, worsening symptoms, or no expected improvement should be reviewed.

Why do my infections keep coming back?

Possible reasons include an infection source that has not cleared, damaged skin, blocked drainage, a medical device, resistant microbes, or reduced immune function. Recurrent or unusually severe infections deserve a medical review rather than repeated self-treatment.

## Sources

- Centers for Disease Control and Prevention. About Sepsis
- Centers for Disease Control and Prevention. About Antibiotic Use and Antimicrobial Resistance
- Centers for Disease Control and Prevention. Clinical Signs and Symptoms of Influenza
- National Institute for Health and Care Excellence. Sepsis: Recognition, Diagnosis and Early Management, guideline NG51
- MedlinePlus. Bacterial Culture Test
- Klein EY, Monteforte B, Gupta A, et al. "The frequency of influenza and bacterial coinfection: a systematic review and meta-analysis." Influenza and Other Respiratory Viruses . 2016;10(5):394-403. doi:10.1111/irv.12398