CONDITION

Appendicitis

Learn about appendicitis symptoms, causes, diagnosis, treatment, possible complications, and when abdominal pain needs urgent medical care.

WHAT IT IS
Inflammation of the appendix

BODY SYSTEM
Digestive

MAIN SYMPTOMS
Abdominal pain, loss of appetite, nausea or vomiting, fever

WHAT CAUSES IT
Appendix blockage followed by infection

HOW IT IS DIAGNOSED
Ultrasound, CT scan, or MRI

MAIN TREATMENT
Appendectomy surgery or antibiotics

CAN IT BE CURED?
Yes, appendix removal prevents recurrence

IS IT AN EMERGENCY?
Yes, requires urgent same-day medical care

LONG-TERM OUTLOOK
Normal life after surgery, but recurrence possible after antibiotics

Overview

Appendicitis is inflammation of the appendix. The appendix is a narrow, finger-shaped pouch connected to the first part of the large intestine, usually in the lower right side of the abdomen.

Appendicitis often begins when the opening of the appendix becomes blocked. Pressure, swelling, and infection can then develop inside it. Without timely treatment, the appendix may develop a hole or burst. This can spread infection into the abdomen.

Appendicitis can occur at any age. Symptoms do not always follow the familiar pattern, especially in young children, older adults, and pregnant people. Other conditions can also cause similar abdominal pain. A medical evaluation is needed to determine the cause.

Suspected appendicitis requires urgent, same-day medical care . Do not wait for a routine

appointment if abdominal pain is worsening, moving toward the lower right side, or occurring with fever, vomiting, or marked tenderness.

Symptoms

Abdominal pain is the most common symptom. In a typical pattern, discomfort begins near the belly button and then moves to the lower right side. The pain often becomes steadier and more intense over several hours. Movement, coughing, deep breathing, or bumps during travel may make it worse.

Other possible symptoms include:

Not everyone has all of these symptoms. Pain may be felt in a different area if the appendix lies in an unusual position. During pregnancy, the location of discomfort may change as the uterus grows. Older adults may have less intense pain or fever even when the condition is serious. Young children may have trouble explaining where they hurt and may instead become unusually tired, irritable, or unwilling to eat.

Symptoms may overlap with a stomach or intestinal infection, kidney stone, urinary tract infection, ovarian cyst, pelvic inflammatory disease, ectopic pregnancy, or other conditions. It is not possible to confirm appendicitis based on symptoms alone.

Seek urgent medical assessment now for new or worsening abdominal pain that is persistent, severe, or focused in the lower right abdomen, especially when it occurs with fever, vomiting, loss of appetite, or pain with movement.

Call emergency services or go to an emergency department if abdominal pain is severe, the abdomen becomes rigid or very swollen, or the person has confusion, fainting, trouble breathing, pale or blotchy skin, or other signs of severe illness. A sudden change in pain does not always mean the problem has resolved. Pain can sometimes briefly lessen after the appendix develops a hole, then become more widespread as infection spreads.

Until evaluated, avoid taking laxatives or using an enema for unexplained severe abdominal pain. If surgery or another procedure may be needed, the clinical team may also ask the person not to eat or drink.

- Loss of appetite
- Nausea or vomiting
- A low-grade fever
- Abdominal swelling or bloating

- Constipation or diarrhea
- Difficulty passing gas
- A general feeling of being unwell

Causes and risk factors

Appendicitis usually develops after the inside of the appendix becomes obstructed. The exact cause of the blockage may not be clear.

Possible causes include hardened stool, swelling of lymph tissue after an infection, and, less commonly, a foreign object or growth. Once blocked, the appendix may swell. Bacteria can multiply inside it, reducing blood flow and damaging the appendix wall.

Appendicitis can affect anyone. It is more common in children, teenagers, and young adults, but age alone cannot rule it in or out. A family history may be associated with increased risk, although most people with appendicitis do not have an obvious inherited cause.

There is no proven home strategy that reliably prevents appendicitis. It is not caused by something a person did wrong, and it cannot usually be predicted in advance.

Diagnosis

A clinician will ask when the pain began, where it is located, whether it has moved, and what makes it better or worse. Questions may also cover appetite, vomiting, bowel movements, urinary symptoms, recent illness, menstrual history, and the possibility of pregnancy.

During the physical examination, the clinician gently checks the abdomen for tenderness, guarding, or stiffness. Guarding means the abdominal muscles tighten in response to touch. The examination may also include the groin, rectum, or pelvis when needed to investigate other possible causes.

No single finding confirms appendicitis in every person. Testing may include:

Clinicians may use a symptom score to estimate how likely appendicitis is, but a score does not replace medical judgment. Sometimes the safest approach is repeated examinations and a period of observation. This allows the team to see whether symptoms improve, remain stable, or develop a clearer pattern.

Imaging may show uncomplicated appendicitis, in which the appendix is inflamed but has not developed a hole, or complicated appendicitis, which may involve perforation, an abscess, or infection spreading through the abdomen.

- Blood tests: These can look for an increased white blood cell count or other signs of inflammation. Normal results do not always exclude appendicitis.
- Urine testing: This may help identify a urinary infection or kidney stone.
- Pregnancy testing: This is important when pregnancy is possible because pregnancy-related conditions can cause similar pain and may change imaging choices.
- Ultrasound: Ultrasound uses sound waves and does not expose the patient to radiation. It is often considered first for children and pregnant people, but the appendix may not always be visible.
- CT scan: Computed tomography provides detailed images and is commonly used in adults when the diagnosis remains uncertain. It involves radiation, and some examinations use contrast material.
- MRI: Magnetic resonance imaging does not use ionizing radiation. It may be used during pregnancy or when ultrasound does not give a clear answer.

Treatment and management

Treatment depends on the examination, test results, whether the appendix has perforated, and the patient's overall health. The care team may include an emergency clinician, surgeon, radiologist, and other specialists.

Appendectomy

An appendectomy is surgery to remove the appendix. It remains a standard treatment for appendicitis and prevents the same appendix from becoming inflamed again. A person can live normally without an appendix.

Most operations are performed laparoscopically. The surgeon uses a camera and instruments through several small incisions. Some situations require an open operation through a larger incision, particularly when infection is extensive or laparoscopic surgery is not suitable.

Patients generally receive anesthesia, fluids, pain control, and antibiotics like amoxicillin or doxycycline around the time of surgery. Recovery depends on the type of operation, the person's health, and whether the appendix had perforated.

Antibiotic treatment

For some people with imaging-confirmed, uncomplicated appendicitis, antibiotics may be considered instead of immediate surgery. This is a shared decision rather than a suitable choice for everyone.

Antibiotics may avoid an operation in the short term, but symptoms can fail to improve or

appendicitis can return later. Some patients treated initially with antibiotics eventually need an appendectomy. Factors such as a hardened deposit in the appendix, called an appendicolith, may affect the chance of treatment failure or complications.

A clinician should explain the expected benefits, uncertainty, need for monitoring, and possibility of later surgery. Antibiotic choice and duration depend on the clinical situation and should be directed by the treating team.

Perforation or abscess

A perforated appendix requires antibiotics and surgical evaluation. If a contained pocket of infection, called an abscess, has formed, treatment may include antibiotics and drainage. Drainage involves placing a tube into the abscess, often with imaging guidance.

In selected stable patients, surgery may be delayed until the infection has settled. In other cases, an operation is performed promptly. The decision depends on the extent of infection, available expertise, and the patient's condition.

Pain medicines and medicines for nausea may be used as supportive care. These treatments can improve comfort, but they do not replace evaluation or treatment of the inflamed appendix.

Complications

The main complication is perforation, which means a hole develops in the appendix. Infection can then spread into the abdominal cavity and cause peritonitis, an inflammation and infection of the abdominal lining.

An abscess may form near the appendix. Infection can also enter the bloodstream and contribute to sepsis, a serious whole-body response to infection. Prompt treatment lowers these risks.

Possible complications after treatment include:

Rarely, scar tissue after abdominal surgery can contribute to an intestinal blockage later. Seek urgent care for severe cramping, repeated vomiting, increasing abdominal swelling, or an inability to pass stool or gas.

- Infection of a surgical incision
- Bleeding
- An abscess inside the abdomen
- Temporary slowing or blockage of the intestines

- Reactions related to anesthesia or medicines
- Recurrent appendicitis after antibiotic-only treatment

Follow up

After surgery, follow the care team's instructions for wound care, bathing, activity, driving, work or school, and pain control. Keep the incision clean and monitor it for increasing redness, swelling, drainage, or opening.

Appetite and energy may return gradually. Walking is often encouraged, but heavy lifting and strenuous activity may need to wait until the surgeon says they are safe. Recovery may take longer after perforation, an abscess, or an open operation.

Contact the treating team promptly for fever, worsening abdominal pain, repeated vomiting, inability to drink, increasing wound redness, pus-like drainage, or pain that is not controlled as expected. These concerns need timely advice and should not wait for a routine visit.

Seek emergency care for severe or rapidly worsening pain, fainting, confusion, trouble breathing, a rigid or markedly swollen abdomen, or signs of severe illness.

People treated with antibiotics without surgery need a clear follow-up plan. They should understand which symptoms may signal persistent or recurrent appendicitis and whom to contact if symptoms return. Follow-up may also include reviewing imaging findings or discussing whether later surgery is appropriate.

Routine follow-up after uncomplicated surgery usually focuses on healing, return to activity, and any pathology results from examination of the removed appendix. The timing and format of follow-up vary by healthcare system and individual recovery.

Sources

- National Institute of Diabetes and Digestive and Kidney Diseases. Appendicitis: Definition & Facts; Symptoms & Causes; Diagnosis; Treatment . National Institutes of Health. Reviewed July 2021.
- Society of American Gastrointestinal and Endoscopic Surgeons. SAGES Guideline for the Diagnosis and Treatment of Appendicitis . Published 2024.

- Di Saverio S, Podda M, De Simone B, et al. Diagnosis and treatment of acute appendicitis: 2020 update of the WSES Jerusalem guidelines. World Journal of Emergency Surgery . 2020;15:27. doi:10.1186/s13017-020-00306-3.
- CODA Collaborative. A randomized trial comparing antibiotics with appendectomy for appendicitis. New England Journal of Medicine . 2020;383:1907-1919. doi:10.1056/NEJMoa2014320.
- American College of Radiology. ACR Appropriateness Criteria: Right Lower Quadrant Pain . Revised 2022.
- American College of Surgeons. Appendectomy: Surgical Removal of the Appendix . Patient Education.