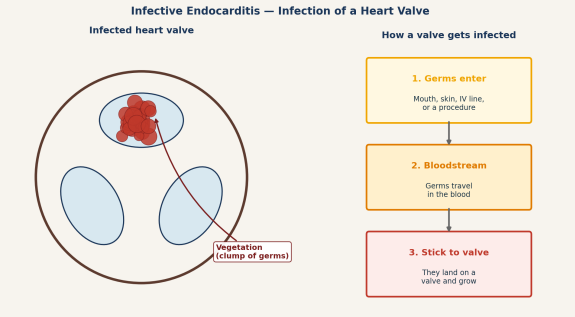
# Understanding Infective Endocarditis

A germ infection of a heart valve — how it is found, how it is treated, and how to prevent it

**A fever that will not quit, plus a heart-valve risk, can mean a valve infection. Found early, it is very treatable.**




**Online:** https://go.riasalimd.com/endocarditis-guide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## Names & Terms You Will Hear

| Term | Meaning |
|---|---|
| Infective endocarditis (IE) | An infection of the inner lining of the heart, most often a heart valve. Germs in the blood land on the valve and grow. |
| Endocarditis | Short name for the same thing. 'Endo' means inside; 'card' means heart. It is the inside heart lining that gets infected. |
| Bacterial endocarditis | The most common form. Bacteria are the usual cause. Fungi cause a smaller number of cases. |
| Vegetation | The clump of germs, cells, and clot that grows on the valve. It is what doctors look for on the heart ultrasound. |
| Native valve endocarditis | Infection of your own natural valve. |
| Prosthetic valve endocarditis (PVE) | Infection of a man-made or repaired valve. It is more serious and often needs surgery. |
| Endocarditis Team | A group of heart and infection doctors who manage tougher cases together. Team care lowers the death rate. |

## What Is Infective Endocarditis?

- Infective endocarditis is an infection of a heart valve or the heart's inner lining. Germs in the bloodstream stick to a valve and grow into a clump called a vegetation.
- Most cases are caused by bacteria. Common germs come from the mouth, the skin, the gut, or an IV line. A smaller number are caused by fungi.
- It usually starts on a valve that is already abnormal, on a man-made (prosthetic) valve, or on a heart device. A normal valve can be infected too, especially with strong germs.
- The vegetation can break off. Small pieces travel in the blood and block vessels in the brain, lungs, kidneys, or limbs. This is why the infection can affect the whole body.
- It is not common, but it is serious. About 3 to 10 people in 100,000 get it each year. Caught early and treated, most people recover.

## Native Valve Endocarditis (Your Own Valve)

- Infection of one of your own natural valves. It often starts on a valve that is already leaky, scarred, or abnormal.
- The mitral and aortic valves (the left-side valves) are infected most often.
- Many cases can be cured with IV antibiotics alone, especially when caught early and the valve is not destroyed.
- Surgery is added when the valve leaks badly, heart failure develops, or the infection will not clear.

## Prosthetic Valve Endocarditis (Man-Made Valve)

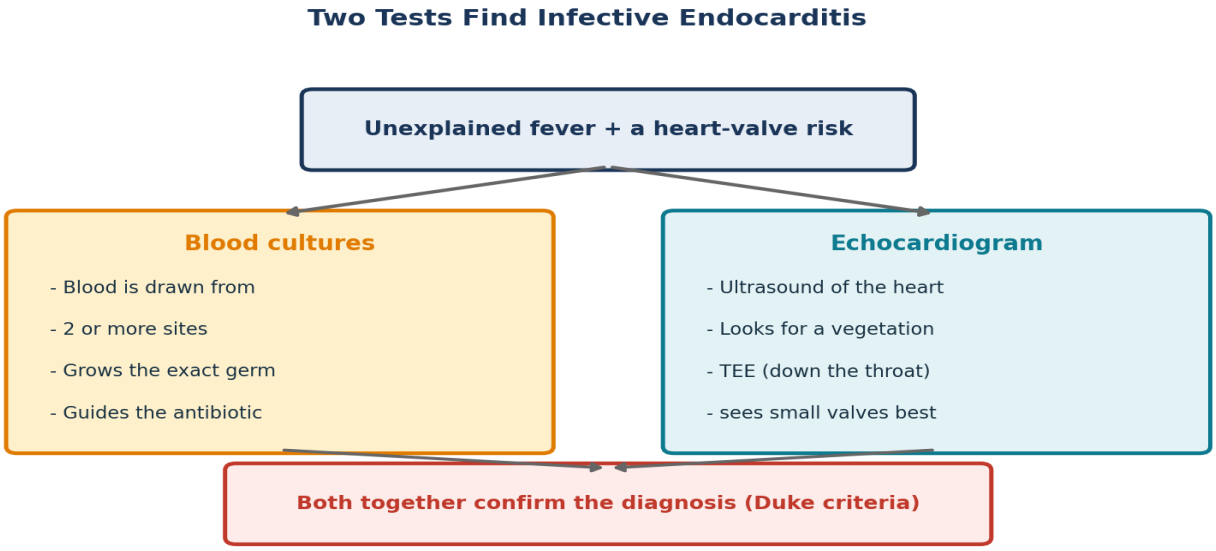
- Infection of a man-made or repaired valve. Germs stick to man-made material more easily than to natural tissue.
- It is more serious than native-valve infection and more likely to need surgery.
- It can happen soon after valve surgery (from germs at the time of the operation) or years later (from a bloodstream infection).
- It is managed by an Endocarditis Team. See our surgical valve replacement guide and TAVR guide for how replacement valves are placed.

## Right-Sided Endocarditis (Often From IV Drug Use)

- Infection of the tricuspid valve, the valve on the right side of the heart. It is the form most often linked to IV drug use.
- Pieces of the vegetation travel to the lungs instead of the brain, so lung symptoms like cough and chest pain are common.
- It often responds to antibiotics, but stopping the source of germs is essential to prevent it coming back.
- Help for substance use is part of the cure. We can connect you with support.

## Why It Matters

- Infective endocarditis is dangerous. Even with treatment, about 15 to 30 in 100 people do not survive the hospital stay. Roughly 1 in 3 do not survive the first year.
- The infection can destroy a valve. A damaged valve can leak badly and cause heart failure. Heart failure is the most common reason a valve must be replaced.
- Pieces of the vegetation can travel to the brain and cause a stroke. They can also seed new infections in the spine, kidneys, or other organs.
- Time matters. The sooner blood cultures and a heart ultrasound are done, the sooner the right antibiotic starts. Early treatment saves valves and lives.
- Prevention is powerful but narrow. Only the highest-risk hearts need an antibiotic before certain dental work. For everyone else, good daily mouth care is the real protection.




*Two tests find a valve infection. Blood cultures name the germ; the echocardiogram shows the vegetation. Together they confirm the diagnosis.*

**The slow-fever trap:** Endocarditis does not always look dramatic. It often hides as weeks of low fever, tiredness, poor appetite, and night sweats. If you have a valve risk and a fever that will not quit, ask about blood cultures before any antibiotic is started — a dose of antibiotic can hide the germ and delay the diagnosis.

## At a Glance — The Three Stages of a Valve Infection

| 1. Germs in the blood | 2. Germs stick to a valve | 3. Spread and damage |
|---|---|---|
| • From mouth, skin, gut, or IV line<br>• Brushing infected gums is a daily source<br>• Most germs are cleared by the body | • An abnormal or man-made valve is easier to grab<br>• A vegetation (clump of germs) grows<br>• Fever and tiredness begin | • Valve leaks; heart failure can start<br>• Pieces break off (stroke, organ damage)<br>• Needs IV antibiotics, sometimes surgery |

## Risk Factors

Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

| Risk Factor | Why It Increases Risk |
|---|---|
| A man-made (prosthetic) valve or valve repair | Man-made material is easier for germs to stick to than natural tissue. This is one of the highest-risk groups. |
| A prior episode of endocarditis | Having had it once raises the chance of getting it again. These patients are watched closely. |
| Certain congenital heart defects | Some defects you are born with, or repairs using man-made material, give germs a place to settle. |
| Damaged or leaky natural valves | Rough or scarred valve surfaces let germs grab on. Examples include rheumatic valve disease and severe leaks. |
| Heart devices (pacemaker or defibrillator leads) | Wires and devices in the heart give germs a surface to grow on. |
| Intravenous (IV) drug use | Germs from the skin enter the blood directly. This often infects the right-side (tricuspid) valve. |
| Long-term IV lines or recent dental or surgical work | Any time germs get into the blood, they can reach the heart. Catheters and dialysis lines are common sources. |
| Poor mouth and gum health | Infected gums leak germs into the blood every day, far more often than a single dental visit does. |

## Treatment Options

- Treatment starts with a long course of antibiotics given through a vein (IV). Most people need 2 to 6 weeks. Pills alone are not strong enough to clear a valve infection.
- The germ is identified from blood cultures. The antibiotic is then matched to that exact germ. Getting the match right is key to a cure.
- Much of the IV antibiotic course can often be finished at home or at an infusion center once you are stable. A care team checks on you closely.
- Some people need valve surgery. The valve is repaired or replaced if it is badly damaged, if heart failure develops, if the infection will not clear, or if large vegetations keep throwing off clots.
- Surgery is timed carefully by an Endocarditis Team of heart and infection doctors. Waiting too long risks more damage; operating too early on an active infection has its own risks.
- Fungal endocarditis and most prosthetic-valve infections almost always need surgery plus a longer drug course. They are managed by a specialist team.
- After treatment, the source of the germ is hunted down — bad teeth, a skin infection, or a colon problem — and fixed so it does not happen again.

### Common Germs and Where They Come From

| Germ family | Where it usually comes from | Notes |
|---|---|---|
| Strep (viridans group) | The mouth and gums | Linked to dental and gum health. Often a slower, milder illness. |
| Staph aureus | The skin, IV lines, drug use | The most common cause now. Often fast and severe. |
| Enterococcus | The gut and urinary tract | More common in older adults and after procedures. |
| Fungi (uncommon) | IV lines, weak immune system | Rare but serious. Almost always needs surgery. |

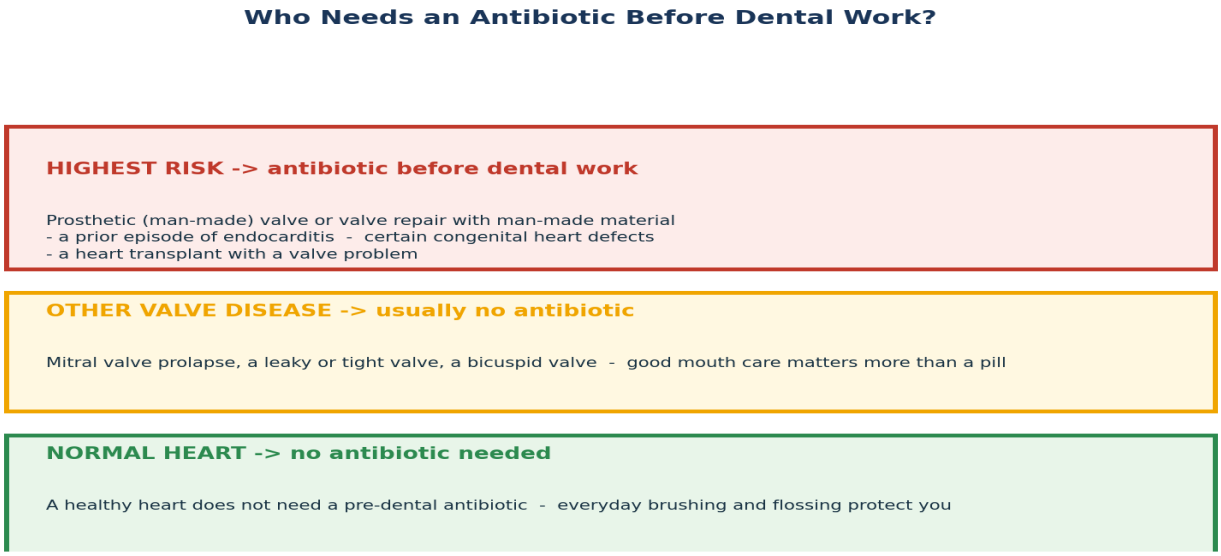
## When Surgery Is Considered

- **Heart failure:** a badly leaking valve that strains the heart is the most common and most urgent reason to operate.
- **Uncontrolled infection:** if the right antibiotics do not clear the infection, or an abscess forms near the valve, surgery removes the source.
- **High stroke risk:** large or mobile vegetations that keep throwing off clots may be removed before they cause a stroke.
- **Prosthetic valve or fungal infection:** these almost always need surgery plus a longer drug course.
- **Timing is a team decision:** an Endocarditis Team weighs the risk of waiting against the risk of operating on an active infection. See our surgical valve replacement guide and TAVR guide for what valve surgery involves.

## Comfort Measures at Home (No Medication Needed)

These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Keep your teeth and gums healthy. Brush twice a day, floss daily, and see a dentist regularly. Healthy gums are your best everyday defense.
- Carry a wallet card or wear a medical alert if you have a prosthetic valve or a prior infection. It tells dentists and doctors you may need an antibiotic.
- Never ignore a fever that lasts more than a few days if you have a valve risk. Call us rather than waiting it out.
- Avoid tattoos, piercings, and non-sterile needles if you are high-risk. Each one is a chance for germs to enter the blood.
- Clean any skin cut well and watch it. See a doctor early for skin infections, boils, or an infected IV site.
- If you have a long-term IV line or get dialysis, follow the line-care steps exactly. Report redness, drainage, or fever right away.




*Only the highest-risk hearts (top, red) need an antibiotic before certain dental work. Most people (middle and bottom) do not — good mouth care protects them.*

## Pre-Dental Antibiotic — Who and What

| Question | Answer |
|---|---|
| Who needs it? | Only the highest-risk hearts: a man-made (prosthetic) valve or repair with man-made material, a prior episode of endocarditis, certain congenital heart defects, or a heart transplant with a valve problem. |
| Which dental work? | Procedures that involve the gums or the area around the tooth root, where bleeding is likely. Routine fillings and X-rays usually do not count. |
| What is given? | Usually a single dose of amoxicillin (2 grams for adults) by mouth, taken 30 to 60 minutes before the procedure. There are other options for penicillin allergy. |
| What if I am not high-risk? | No antibiotic is needed. Daily brushing and flossing protect you far better than a one-time pill. |

## Risks, Benefits, and Alternatives

Every choice has trade-offs. Use this table to start the shared decision conversation.

| Option | Risks | Benefits | Alternatives |
|---|---|---|---|
| IV antibiotics (2 to 6 weeks) | Long IV line. Possible drug side effects, diarrhea, or kidney strain. Time and monitoring. | Clears the infection in most people. Can save the valve. The mainstay of cure. | There is no real alternative to antibiotics for a true valve infection. Pills alone do not work. |
| Valve surgery (repair or replacement) | Major open-heart operation. Risks of bleeding, stroke, and re-infection of a new valve. | Removes destroyed tissue and infected material. Fixes heavy leaks and heart failure. Lifesaving in the right patients. | Antibiotics alone (if the valve is not destroyed and the infection is clearing). Delay surgery with close watching. |
| Pre-dental antibiotic for high-risk hearts | A single dose can rarely cause an allergic reaction or stomach upset. Overuse breeds resistant germs. | Lowers the risk of a valve infection from bleeding dental work in the highest-risk patients. | No antibiotic plus excellent daily mouth care (the right choice for most people, who are not high-risk). |
| Surgery to remove an infected device | Removing pacemaker or defibrillator leads carries its own procedure risk. | Clears infected hardware that antibiotics cannot sterilize. Often required for a cure. | Antibiotics alone (rarely enough when a device is the source). A specialist lead-extraction team. |

## Common Misconceptions

| Myth | Reality |
|---|---|
| Everyone with a heart murmur needs an antibiotic before the dentist. | Not anymore. Guidelines changed in 2007. Only the highest-risk hearts — a man-made valve, a prior infection, or certain congenital defects — need a pre-dental antibiotic. A simple murmur or mitral valve prolapse does not. |
| A single dental cleaning is the main way people get endocarditis. | Day-to-day chewing, brushing, and flossing put far more germs into the blood over a year than one dental visit. That is why daily mouth care matters more than a one-time pill. |
| If I feel only a little tired and have a low fever, it cannot be serious. | Endocarditis often starts slowly with low fever, tiredness, and night sweats over weeks. These mild symptoms are exactly how it hides. With a valve risk, get it checked. |
| Antibiotic pills will cure it. | A valve infection needs antibiotics through a vein (IV), usually for weeks. The germs hide deep in a clump on the valve where pills cannot reach in high enough amounts. |
| If I need surgery, the antibiotics failed. | Surgery is not a failure. Many people need both. Surgery removes destroyed tissue and fixes a leaking valve; antibiotics clear the germs. Together they give the best chance of cure. |
| Once I finish antibiotics, I can never get it again. | You can. Having had endocarditis raises your future risk. That is why prevention, dental care, and prompt fever checks stay important for life. |
| Only IV drug users get endocarditis. | IV drug use is one cause, but most patients get it another way — a prosthetic valve, a damaged valve, a heart device, dialysis, or a bloodstream infection from any source. |

## Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

| Where / What | What Can Happen |
|---|---|
| Heart valve damage and heart failure | The infection eats away valve tissue. The valve can leak badly. This is the most common serious complication and the top reason a valve must be replaced. |
| Stroke and brain problems | A piece of the vegetation can break off and travel to the brain, blocking a vessel. This causes a stroke. It can also cause brain bleeds or pockets of infection. |
| Spread to other organs (septic emboli) | Bits of infected clump can lodge in the lungs, kidneys, spleen, or limbs. They block vessels and can start new infections far from the heart. |
| Infection in the spine or joints | Germs can settle in the spine (causing back pain) or in a joint. This may need its own long antibiotic course and sometimes drainage. |
| Abscess near the valve | The infection can burrow into the heart muscle around the valve and form a pocket of pus. This can disrupt the heart's wiring and almost always needs surgery. |
| Sepsis (whole-body infection) | If germs flood the bloodstream, blood pressure can drop and organs can fail. This is a medical emergency that needs hospital care right away. |

**Watch for an irregular heartbeat.** A valve infection and the strain it puts on the heart can trigger atrial fibrillation, which adds its own stroke risk. If you feel a new fluttering or racing heartbeat, tell us. Our atrial fibrillation guide explains it.

## Points to Know

If you remember nothing else, remember these key points.

- Infective endocarditis is a germ infection of a heart valve. It is uncommon but serious, so it is found and treated fast.
- The two key tests are blood cultures (to find the germ) and an echocardiogram (to see the valve). Both together confirm it.
- Treatment is weeks of IV antibiotics matched to the exact germ. Some people also need valve surgery.
- Only the highest-risk hearts need an antibiotic before certain dental work: a man-made valve, a prior infection, or certain congenital defects.
- For everyone else, daily brushing and flossing protect you far better than any pill. Healthy gums are the real prevention.
- A fever lasting more than a few days, plus a heart-valve risk, is a reason to call us, not to wait.
- If you have a prosthetic valve or a prior infection, tell every dentist and doctor. Carry a card so they know.

# When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- A fever over 100.4 F that lasts more than a few days, especially with a valve risk — call us this week.
- Fever with new tiredness, night sweats, or weight loss — call us this week. These can be early signs.
- Sudden weakness, face droop, trouble speaking, or vision loss — call 911. This can be a stroke.
- New or worse shortness of breath, swelling, or trouble lying flat — call us today. This can mean a failing valve.
- Confusion, a very high fever, fast heartbeat, or feeling that you might pass out — call 911. This can be sepsis.
- Chest pain or pressure — call 911.
- Painful red spots on fingers or toes, or new dark lines under the nails, with fever — call us today.
- Redness, drainage, or fever from an IV line or surgical wound — call us today.

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**Tell every dentist and doctor** if you have a man-made valve, a repaired valve with man-made material, or a prior episode of endocarditis. You may need an antibiotic before certain dental work. Carry a wallet card so the dental office knows.

## Trusted Resources

The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- Cleveland Clinic — Endocarditis - Plain-language overview of valve infection, symptoms, dental-care precautions, and treatment.
- Mayo Clinic — Endocarditis - Patient guide to causes, complications, prevention, and IV antibiotic and surgery treatment.
- American Heart Association — Infective Endocarditis - AHA patient hub on endocarditis and who needs antibiotic prophylaxis.
- American Dental Association — Antibiotic Prophylaxis - When a pre-dental antibiotic is and is not recommended, with the standard dose.

# Sources Used to Build This Guide

Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- AHA Scientific Statement — Prevention of Infective Endocarditis (2007 Wilson, reaffirmed 2021) *[Guideline]*
  Foundational AHA antibiotic-prophylaxis recommendations limiting prophylaxis to the highest-risk cardiac conditions, with the amoxicillin 2 g pre-dental regimen.
- AHA Science Advisory — Nondental Invasive Procedures and Risk of IE: Time for a Revisit (2024) *[Guideline]*
  Current AHA re-evaluation of procedure-related endocarditis risk and prophylaxis for nondental procedures.
- 2023 ESC Guidelines for the Management of Endocarditis (Delgado et al., Eur Heart J) *[Guideline]*
  Most recent comprehensive guideline; upgraded prophylaxis to Class I for high-risk patients, endocarditis-team model, imaging and surgery timing.
- ACC — 2023 ESC Guidelines for Management of Endocarditis: Key Points *[Guideline]*
  Concise ACC summary of the 2023 ESC high-risk conditions, prophylaxis, and Heart/Endocarditis-Team recommendations.
- 2023 Duke-ISCVID Criteria for Infective Endocarditis (Fowler et al., Clin Infect Dis) *[Guideline]*
  Updated diagnostic criteria combining blood-culture (microbiologic) and imaging (echo/CT/PET) findings used to confirm the diagnosis.
- Cleveland Clinic — Endocarditis *[Clinical]*
  Patient overview of valve infection, symptoms, dental-care precautions, and treatment.
- Mayo Clinic — Endocarditis *[Clinical]*
  Patient overview of causes, complications, prevention, and IV antibiotic/surgery treatment.
- American Dental Association — Antibiotic Prophylaxis Prior to Dental Procedures *[Clinical]*
  Dental-side companion to the AHA premedication guidance: who needs a pre-dental antibiotic and the standard regimen.

# About This Guide

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**Version:** 2026-08-15

**Reviewer note:** Reviewed: Cleveland Clinic, Mayo Clinic, AHA, American Dental Association patient pages. This guide adds a plain-language diagnosis diagram (blood cultures plus echo), a clear who-needs-a-pre-dental-antibiotic risk ladder built on the 2007/2021 AHA and 2023 ESC guidance, an organ-by-organ complications table, and an RBA section that names valve surgery.

## Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.

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