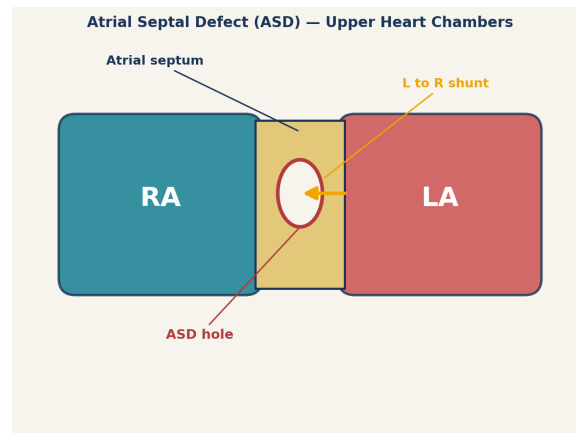


Understanding Atrial Septal Defect (ASD)

A hole between the heart's two upper chambers

One of the most common adult heart birth defects. Modern closure is often a catheter, not open surgery.



Online: <https://go.riasalimd.com/asd-guide>

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Names & Terms You Will Hear

Term	Meaning
Atrial septal defect (ASD)	A hole in the wall between the two upper chambers of the heart. Present from birth.
Atrial septum	The thin wall between the left atrium and the right atrium.
Secundum ASD	The most common type (~75%). Hole in the middle of the septum. Often closable with a catheter device.
Primum ASD	A hole at the lower edge of the septum near the heart valves. Needs surgery. Often seen with Down syndrome.
Sinus venosus ASD	A hole at the top of the septum near the major vein. Needs surgery. May involve a misrouted lung vein.
Left-to-right shunt	Extra blood flowing from the left upper chamber through the hole into the right upper chamber.
Qp:Qs ratio	A measure of how much extra blood goes to the lungs. Above 1.5 means 50% or more extra flow — a sign that closure is needed.
Eisenmenger syndrome	A rare, late result of a large unrepaired ASD. The pressure in the lung arteries becomes so high that blood flows backward. Closure is no longer safe at this stage.



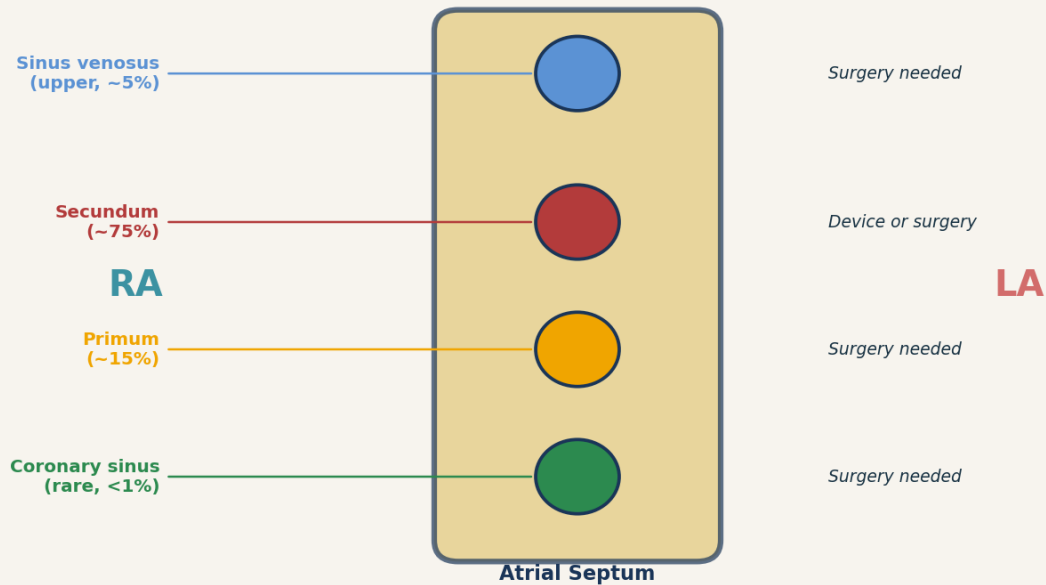
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ASD Types — Position on the Atrial Septum



The four ASD types by location on the atrial septum. Secundum (red, mid-septum) is the most common and can often use a device. Primum and sinus venosus types need surgery.

ASD types at a glance: location, frequency, and closure method

Type	Location	How Common	Closure Method
Secundum	Mid-septum	~75%	Device (catheter) or surgery
Primum	Lower septum	~15%	Surgery only
Sinus venosus	Upper septum	~5-10%	Surgery only
Coronary sinus	Near rear of heart	<1%	Surgery only



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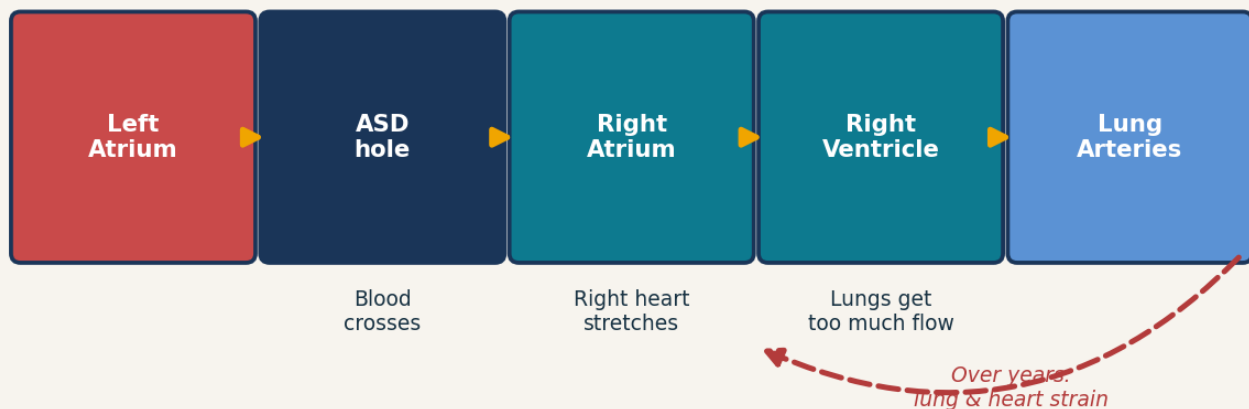


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What Is Atrial Septal Defect (ASD)?

- An ASD is a hole in the wall between the two upper chambers of the heart.
- It is a birth defect. Blood leaks from the left upper chamber (left atrium) to the right upper chamber (right atrium).
- There are four named types. Each is in a different spot on the wall. The type decides how the hole is closed.
- ASDs are common. About 1 in 1,000 adults has one.
- Many people have no symptoms as children. Some are found by accident during a heart test.
- An ASD is not the same as a PFO. A PFO is a flap, not a true hole. They have different treatments.

How an ASD Overloads the Right Heart



Step-by-step: blood crosses from the left atrium through the ASD into the right atrium, overloading the right heart and lung arteries. Over years this can cause lung pressure problems and right heart failure.

ASD vs PFO — Key Difference

A **PFO** is a flap-like gap left from before birth. About 1 in 4 adults has one. Most cause no problems. An **ASD** is a true hole in the wall with its own anatomy and blood-flow burden. They have different closure criteria and different devices. See our companion guide at go.riasalimd.com/pfo-guide.



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Why It Matters

- Extra blood keeps flowing from left to right through the hole.
- This makes the right upper and lower chambers work too hard.
- Over time the right heart can enlarge and weaken.
- Too much blood to the lungs can raise pressure in the lung arteries.
- A large unrepaired ASD can lead to an irregular heartbeat called atrial fibrillation (AFib).
- Blood clots can cross through the hole and cause a stroke.
- Fixing the hole early prevents these problems.



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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
Large shunt (Qp:Qs above 1.5)	Too much extra blood goes to the lungs. This is a main reason to close the hole.
Right heart enlargement	The right chambers are too big from overwork. A sign that the shunt is significant.
Unrepaired ASD in adults	The older the defect, the more the heart and lung arteries have been stressed.
High lung artery pressure	Rising pressure makes closure harder or unsafe if not addressed in time.
Down syndrome	Linked to primum and AV septal defect types. Often requires early repair.
Atrial fibrillation or flutter	A stretched right atrium is prone to irregular rhythms. AFib raises stroke risk.
Prior stroke with no clear cause	Clots can cross through an ASD and reach the brain.



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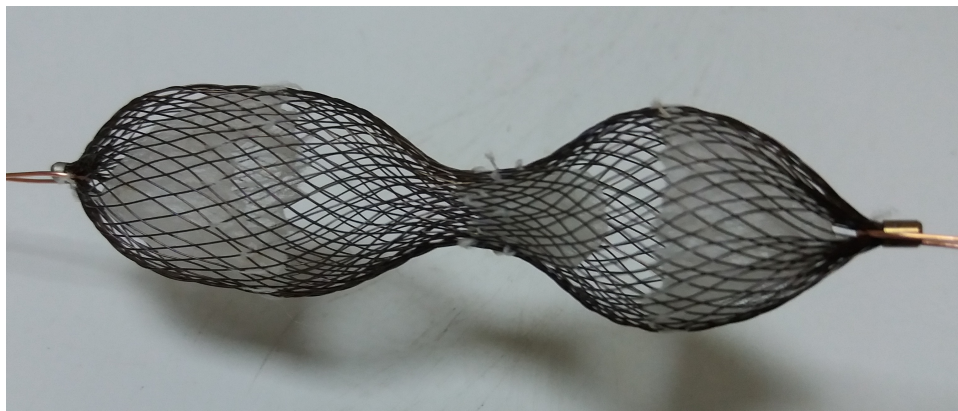
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Treatment Options

- **Watching and waiting:** Small ASDs with no right heart strain may only need check-ups. Not every ASD needs closure.
- **Closure:** Needed when the shunt is large (Qp:Qs above 1.5) or the right heart is enlarged. Also done after a stroke from the ASD.
- **Device closure (catheter):** A doctor threads a small device through a vein in the groin. The device plugs the hole. Examples: **Amplatzer Septal Occluder** and **GORE Cardioform ASD Occluder**. Only works for secundum ASDs with the right anatomy. Most patients go home the next day.
- **Surgery:** Needed for primum, sinus venosus, and coronary sinus ASDs. The doctor sews or patches the hole shut. Some patients also need a misrouted vein moved back to the right place.
- **No closure for Eisenmenger syndrome:** When lung pressures are too high and the shunt has reversed, closing the hole is not safe. These patients get medicines instead.
- **Medicines:** Pills can ease swelling and manage an irregular heartbeat. They do not close the hole.
- **After device closure:** Aspirin daily for 6 months. Echo check-ups at 1, 6, and 12 months. Tell your dentist about the device for 6 months.



A real Amplatzer-style septal occluder device — the double-disc nitinol mesh implant used to close a secundum ASD through a vein in the groin, without open surgery.



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Secundum ASD — Catheter Device Closure

- The most common type (~75%). A device can close it without surgery if the anatomy is right.
- A doctor guides a thin tube through a leg vein to the heart and releases a small double-disc device across the hole.
- Examples: **Amplatzer Septal Occluder** and **GORE Cardioform ASD Occluder**.
- The heart tissue grows over the device in 3-6 months, sealing the hole for good.
- The hole must have enough firm rim around it — at least 5 mm — for the device to grip.
- Procedure takes about 1 hour. Most patients go home the next day.
- Take aspirin (81-325 mg) for 6 months after the procedure.



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Primum and Sinus Venosus ASD — Surgery

- **Primum ASD** (lower septum, ~15%): Near the heart valves. A device cannot grip here. Surgery is needed. Linked to Down syndrome.
- **Sinus venosus ASD** (upper septum, ~5-10%): Often comes with a lung vein draining to the wrong side. The surgeon fixes both the hole and re-routes the vein.
- Surgery is done under general anesthesia with the heart briefly stopped.
- The surgeon sews or patches the hole with a piece of body tissue or synthetic material.
- Most adults take 4-6 weeks to recover. Return to full activity in 8-12 weeks.
- Success rates are above 98% at experienced centers.



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When Is Closure Needed?

- **Qp:Qs above 1.5:** More than 50% extra blood is going to the lungs. This is a key sign that closure is needed.
- **Right heart enlargement:** When the right chambers are too big on echo, closure is recommended — even with no symptoms.
- **Stroke from the ASD:** A prior stroke with no other cause is a strong reason to close the hole.
- Closing before age 25 gives the best long-term results.
- Closure still helps adults in their 40s, 50s, and 60s. It can improve breathing and lower AFib risk.
- Closure is **NOT done** if lung pressures are severely high and cannot be reversed — this is Eisenmenger syndrome.



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Risks, Benefits, and Alternatives

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

Option	Risks	Benefits	Alternatives
Watch and wait	If the shunt is large, the right heart will keep enlarging. AFib and lung pressure may rise over time.	No procedure or side effects. Right choice for small holes with no right heart strain.	Device closure. Surgery.
Device closure (Amplatzer or GORE)	Small risks: groin bleeding (~1%), device moving out of place (<1%), new AFib (~2-5% in first month), small remaining leak (<2%), rare heart wall damage (1 in 1,000).	Fixes the shunt without open surgery. Quick recovery. Prevents right heart failure and stroke. Best results when done before age 25.	Surgery (if anatomy not right for device). Watch and wait (if hole is small).
Surgery	Risks of open-heart surgery: infection (~1%), bleeding, blood transfusion, scar, 4-6 week recovery.	Needed for primum and sinus venosus types. Works well for large or complex holes. Success rate over 98%.	Device closure (if anatomy allows). Watch and wait (if low shunt burden).
Medicines only (no closure)	Does not fix the hole. Only treats symptoms. The shunt and heart strain continue.	Good for relief of swelling and rhythm control. Right choice when closure is not safe (Eisenmenger).	Device or surgical closure when safe.



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Common Misconceptions

Myth	Reality
A hole in the heart always needs urgent surgery.	Not true. Small ASDs with no right heart strain can be watched over time. Many never need closure. Timing depends on the size and type of hole.
I need open-heart surgery for my ASD.	The most common type (secundum) can often be closed with a small device through a leg vein. No chest cut is needed. Most patients go home the next day. Surgery is only for certain types.
PFO and ASD are the same thing.	They are not. A PFO is an unfused flap, not a true hole. An ASD is a structural hole in the wall. They have different shapes, different treatments, and different devices. Do not mix up the two.
Closing the ASD will cure my AFib.	Closing the hole can lower the long-term risk of new AFib. But AFib that already exists often stays after closure. Your doctor will treat the AFib as a separate issue.
The ASD will close on its own.	Adult ASDs do not self-heal. Small secundum holes may close in infancy. By adulthood, the hole is stable and will not close without treatment.
I am too old for ASD closure.	Adults in their 50s and 60s can still benefit from closure. It can improve how far you can walk and lower arrhythmia risk. Age alone does not rule out the procedure.



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Possible Complications

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

Where / What	What Can Happen
Pulmonary hypertension	High blood pressure in the lung arteries from too much blood flow over many years. If very severe, it can make closure unsafe.
Right heart failure	The right chambers get too large and too weak. This causes tiredness, leg swelling, and fluid buildup.
Atrial fibrillation (AFib)	An irregular heartbeat. Common in adults with unrepaired ASDs. Raises stroke risk.
Stroke from paradoxical embolism	A blood clot crosses from the right side through the hole to the left side and travels to the brain.
Eisenmenger syndrome	The blood flow through the hole reverses from right to left. Blood oxygen drops. Lips and fingertips may turn blue. Closure is no longer safe.
After device closure	Rare risks: device slipping out of place, small remaining leak, new AFib in the first weeks, or damage to the heart wall.
After surgery	Standard surgical risks: infection, fluid around the heart, extra fluid in the lungs, irregular heartbeat.



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Eisenmenger Syndrome — When the Window Closes

- A large unrepaired ASD sends too much blood to the lungs year after year.
- Over time the lung arteries stiffen. Lung blood pressure rises.
- When lung pressure equals or exceeds body pressure, blood flow through the hole reverses. Now blood flows from right to left instead of left to right.
- This is called **Eisenmenger syndrome**. Low-oxygen blood enters the body. Lips and fingertips may look blue.
- At this stage, closing the ASD is dangerous. The hole is now a pressure release valve. Without it the right heart could fail acutely.
- Treatment shifts to medicines that lower lung artery pressure (such as bosentan or sildenafil) and supportive care.
- The lesson: do not delay an ASD evaluation. The chance for safe closure narrows as lung pressures rise.



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Points to Know

If you remember nothing else, remember these key points.

- An ASD is a hole in the wall between the two upper chambers of the heart.
- There are four types. The type decides if a device or surgery is used.
- The most common type (secundum, ~75%) can often be fixed with a catheter device — no open surgery.
- Closure is needed when there is too much blood crossing the wall or when the right heart is enlarged.
- Do not wait too long. If lung pressures get too high, closure may no longer be safe.
- After device closure: take aspirin for 6 months and keep your echo check-ups.
- Small holes with no right heart strain can be safely watched over time.
- An ASD is not the same as a PFO. Ask your doctor which one you have.



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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.

- **Call 911** for stroke signs: sudden face droop, arm weakness, trouble speaking, or vision loss.
- **Call 911** for chest pain, fainting, or severe shortness of breath at rest.
- **Call 911** if your lips or fingertips turn blue — this can mean very low oxygen.
- **Call our office today** if you notice a new fast or irregular heartbeat.
- **Call our office** for new or worse shortness of breath during activity, leg swelling, or puffy ankles.
- **Call our office within 24 hours** after any brief stroke-like event — even if it went away.
- **After device closure:** Call right away for fever, chest pain, or trouble breathing.
- **Before pregnancy:** Talk to us if you have an unrepaired ASD. Pregnancy puts extra strain on the heart.

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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.

- [American Heart Association — ASD](#) - Plain-language ASD overview from the AHA.
- [Mayo Clinic — Atrial Septal Defect](#) - Detailed ASD page: symptoms, diagnosis, and treatment.
- [Cleveland Clinic — ASD](#) - Device vs surgery framing and post-closure care.
- [Adult Congenital Heart Association \(ACHA\)](#) - Resources for adults with congenital heart conditions including ASD.
- [NIH MedlinePlus — ASD](#) - Basic ASD overview with anatomy diagrams.
- [Our PFO Guide](#) - PFO is related to but different from ASD. See this guide for details.



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Sources Used to Build This Guide

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- [AHA — Atrial Septal Defect](#) [Patient-Org]
Primary plain-language ASD patient overview; prevalence and symptom data.
- [Mayo Clinic — ASD](#) [Patient-Org]
Comprehensive ASD overview: types, diagnosis, treatment decision framing.
- [Cleveland Clinic — ASD](#) [Patient-Org]
Device-vs-surgery closure framework; closure indications.
- [Adult Congenital Heart Association \(ACHA\)](#) [Patient-Org]
Adult congenital framing; lifetime monitoring guidance.
- [ACC/AHA 2018 Guideline — Adult Congenital Heart Disease](#) [Guideline]
Class I closure indication criteria (Qp:Qs > 1.5, RV volume overload); device vs surgical closure thresholds.
- [NIH MedlinePlus — Atrial Septal Defect](#) [Patient-Org]
Plain-language anatomy and symptom descriptions.
- [Lindsey & Hillis — ASD in Adults \(NEJM Review\)](#) [Review-Article]
Comprehensive adult ASD clinical review; Eisenmenger physiology; pulmonary HTN thresholds.
- [GORE HELEX / Amplatzer — Device closure data](#) [Clinical-Trial]
Randomized comparison of device types; procedural success and complication rates.



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About This Guide

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Reviewer note: Reviewed against Mayo Clinic, Cleveland Clinic, AHA, and ACHA ASD pages. This guide adds: the four named ASD types with locations, closure criteria (Qp:Qs and RV overload), named devices (Amplatzer, GORE Cardioform), Eisenmenger framing, and a cross-link to the companion pfo-guide.

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