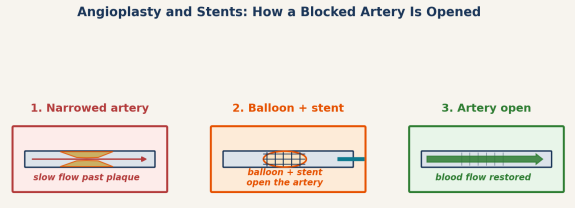
Angioplasty and Stents

Percutaneous Coronary Intervention (PCI) — One of Two Revascularization Strategies

PCI and CABG are two paths to revascularization. The right choice depends on YOUR anatomy. Either way, medicines, rehab, and lifestyle are what make it last.



Online: https://go.riasalimd.com/angioplasty-stents-guide

Rias KS Ali, MD FACC

Board Certified in Interventional Cardiology & Cardiovascular Disease

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com

Last Updated: August 2026

Names & Terms You Will Hear

Term	Meaning
Angioplasty	A balloon-tipped catheter is threaded into a narrowed artery and inflated to push the plaque against the wall. Today, a stent is almost always placed at the same time.
Percutaneous coronary intervention (PCI)	The full name for the cath-lab procedure that opens a narrowed or blocked heart artery. 'Percutaneous' means through the skin. PCI is the umbrella term for angioplasty + stenting.
Stent	A small mesh tube placed in the artery to hold it open after the balloon is deflated. Most stents today are drug-coated.
Drug-eluting stent (DES)	The modern default stent. It slowly releases a medicine that lowers the chance the artery narrows again.
Bare-metal stent (BMS)	An older stent without a drug coating. Rarely used today - mostly when blood thinners need to be stopped quickly.
Bioresorbable scaffold (BVS)	An older stent that was meant to dissolve over time. Withdrawn from the US market in 2017 after trials showed more clots than with metal stents.
Radial access	Going in through the artery at the wrist. The preferred approach today - lower bleeding, faster recovery, often same-day discharge.
Femoral access	Going in through the artery at the groin. Used when the wrist artery is small, blocked, or for complex tools that need a bigger entry.
Sheath	A short hollow tube placed in the artery at the wrist or groin. The catheters slide in and out through the sheath during the procedure.
Catheter	A long, thin, flexible tube that the cardiologist guides up to the heart through the sheath.
Guidewire	A very thin wire steered across the blockage. The balloon and stent ride over the wire to the lesion.

Term	Meaning
Dye (contrast)	An iodine-based liquid that lights up the arteries on x-ray so the team can see the narrowing and target it.
FFR / iFR	Pressure measurements inside the artery that tell the team whether a narrowing is really limiting blood flow. They help decide if a stent is needed.
IVUS / OCT (intravascular imaging)	Tiny cameras and sound probes that look inside the artery from the inside. They help size the stent and confirm it is fully expanded.
Revascularization	The umbrella term for restoring blood flow to a narrowed or blocked artery. PCI and CABG are the two main strategies.
Heart Team	A multidisciplinary meeting of interventional cardiologists, cardiothoracic surgeons, and heart-failure specialists. For complex or borderline cases, the Heart Team reviews your anatomy together and recommends PCI, CABG, or medicines.
Rotational atherectomy (Rotablator)	A diamond-tipped burr spinning at 140,000-180,000 RPM shaves heavily calcified plaque into microparticles so the stent can open fully. Made by Boston Scientific.
Orbital atherectomy (CSI Diamondback)	An eccentric crown spins with orbital motion; differential cutting targets calcium only and spares healthy tissue. Made by Cardiovascular Systems Inc (CSI).
Intravascular lithotripsy (IVL / Shockwave)	Sonic pulses (about 50 per second) crack the calcium in the artery wall without injuring soft tissue. A gentler way to prepare heavily calcified plaque. Made by Shockwave Medical.
Excimer laser (Spectranetics / Philips ELCA)	An excimer gas laser (Xenon-Chloride) producing a 308 nm ultraviolet wavelength that vaporizes plaque, in-stent narrowing, and clot. Used for in-stent restenosis, chronic total occlusion (CTO), and thrombus-rich lesions.
Solid-state laser (Auryon, Eximo)	A newer 355 nm ultraviolet solid-state laser with broader plaque-targeting ability. Made by AngioDynamics.

Term	Meaning
CABG (coronary artery bypass grafting)	Open-heart surgery that builds a new pathway around the blockage using a vein or artery. The other revascularization strategy. For some patients with many blockages, left-main disease, or diabetes, CABG is the better choice.
DAPT (dual antiplatelet therapy)	Two blood-thinning pills - aspirin plus a second drug - taken together for months after a stent to keep new clots from forming on the stent struts.
In-stent restenosis	The artery slowly narrowing again inside the stent over months or years. Less common with drug-coated stents.
Stent thrombosis	A sudden clot inside the stent. Rare but serious. Most often happens early when the two blood thinners are stopped too soon.
Cardiac rehab	A supervised program of exercise, education, and counseling after a heart event. One of the most powerful treatments for the long run.

A stent is the rescue. The recovery is the rest. The two blood-thinning pills, the statin, the blood-pressure medicines, and cardiac rehab are what keep the next blockage from forming. Patients who do all five have the best long-term results.

Angioplasty and Stents?

- Angioplasty is a procedure that opens a narrowed or blocked heart artery using a small balloon. A stent is then almost always placed to hold the artery open.
- The full name is percutaneous coronary intervention, or PCI. 'Percutaneous' means through the skin, with no big cut.
- The team works through a small tube placed in the artery at the wrist or, less often, the groin. Most patients are awake.
- X-ray and a special dye show where the blockage is. A thin wire is guided across the blockage, then a balloon presses the plaque against the wall, and a stent is left behind to hold the artery open.
- Most stents today are drug-coated. The drug slowly releases over weeks and lowers the chance the artery narrows again.
- The whole procedure usually takes 30 to 90 minutes. Many patients go home the same day or the next morning.

Stent Types - What Goes Inside the Artery

Stent type	What it is	How it is used today
Drug-eluting stent (DES)	Metal stent coated with a drug that slowly releases over weeks	The modern default. Lower chance the artery narrows again (NORSTENT trial).
Bare-metal stent (BMS)	Plain metal mesh, no drug coating	Rarely used today - mostly when blood thinners need to stop quickly for surgery.
Bioresorbable scaffold (BVS)	Designed to dissolve over a few years	Withdrawn from US market in 2017 after trials showed more clots. Not used today.

What a Stent Is - and What It Is Not

- A stent is a small mesh tube - about the size of a spring inside a ballpoint pen.
- Once the artery heals over the stent, you cannot feel it and it does not show up on routine x-rays of the chest.
- Most modern stents are drug-coated. The drug slowly releases over weeks and lowers the chance the artery narrows again.
- A stent does NOT cure the disease. The plaque buildup is in the whole artery system - the stent only fixes one spot.
- A stent does NOT need to be replaced. The artery wall grows over it in weeks to months. The stent stays for life.
- Modern coronary stents are safe in MRI scanners. They will not set off airport metal detectors.

Why It Matters

- For a heart attack with a fully blocked artery (STEMI), PCI is the fastest and most effective way to open the artery and save heart muscle.
- For higher-risk heart attacks without a fully blocked artery (NSTEMI), PCI within a day or two lowers the chance of another event.
- For stable chest pain that is not improving on medicines, PCI can ease symptoms and improve quality of life - though it does not always add years to life.
- Modern PCI is much safer than it was even a decade ago, thanks to better stents, smaller tubes, wrist access, and better imaging.
- But a stent treats the spot, not the disease. The medicines, cardiac rehab, and lifestyle changes are what keep the rest of the arteries from narrowing.

In a heart attack, PCI saves lives. For STEMI (full blockage), primary PCI within 90 minutes of arrival cuts mortality by about half versus no reperfusion. For NSTEMI (partial blockage), an early invasive strategy within 24-72 hours lowers the chance of another event. In cardiogenic shock (the heart can't keep up), emergent PCI of the culprit artery — often with mechanical support like Impella or ECMO — is life-saving (CULPRIT-SHOCK trial).

Stable disease vs. heart attack — the timing matters. In stable disease, a narrowed artery has been there for months or years. PCI eases symptoms but does not add years to life (ISCHEMIA trial). In a heart attack, the artery is acutely blocked and muscle is dying every minute. Stable disease can turn into a heart attack overnight when plaque ruptures — that's why aggressive medicines, lifestyle, and monitoring matter even when a stent is not placed today.

Risk Factors

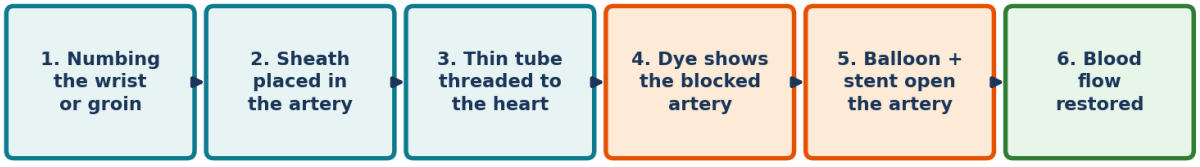
Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

Risk Factor	Why It Increases Risk
Higher bleeding risk	Older age, kidney disease, prior bleeding, low platelets, or certain medicines all raise the chance of bleeding from the two blood-thinning pills.
Kidney disease	The dye used during the procedure can stress weak kidneys. The team uses less dye and gives extra fluids when this is a concern.
Diabetes	Diabetes raises the risk of restenosis and of disease in other arteries. The team may use special tools and is more thoughtful about PCI vs CABG.
Many blockages or complex disease	Multi-vessel or left-main disease - especially in patients with diabetes - sometimes favors surgery (CABG) over PCI.
Calcified ('rocky') arteries	Heavily calcified plaque can keep a stent from opening fully. The team may use atherectomy or sound-wave lithotripsy first.
Small or tortuous arteries	Very small or twisty arteries are harder to reach safely. Sometimes the wrist artery is too small and the groin is used instead.
Active bleeding or recent surgery	The two blood-thinning pills after a stent can be dangerous in the first weeks after major surgery. The team weighs timing carefully.
Inability to take blood thinners	If the two pills cannot be taken even for a short time, a stent may not be safe. Other options - medicines alone or CABG - are discussed.

Treatment Options

- PCI is done in the cath lab. Most patients are awake but relaxed, with light sedation through an IV.
- The wrist (radial) is preferred. The groin (femoral) is used when the wrist artery is small, blocked, or when bigger tools are needed.
- A small numbing shot is given at the entry point. A sheath is placed in the artery, then a catheter is guided up to the heart.
- Dye shows the blockage. A thin wire is steered across it, and a balloon - sometimes with a stent already on it - opens the artery.
- The team often uses pressure measurements (FFR or iFR) or pictures from inside the artery (IVUS or OCT) to choose the right size and place the stent well.
- For heavily calcified plaque, the team may use atherectomy or sound-wave lithotripsy first, so the stent opens fully.
- After the artery is open, the sheath is removed. A wristband or pressure device holds the entry site until it seals.
- Most patients go home the same day after a radial procedure, or the next morning. Heart-attack patients may stay a few days.

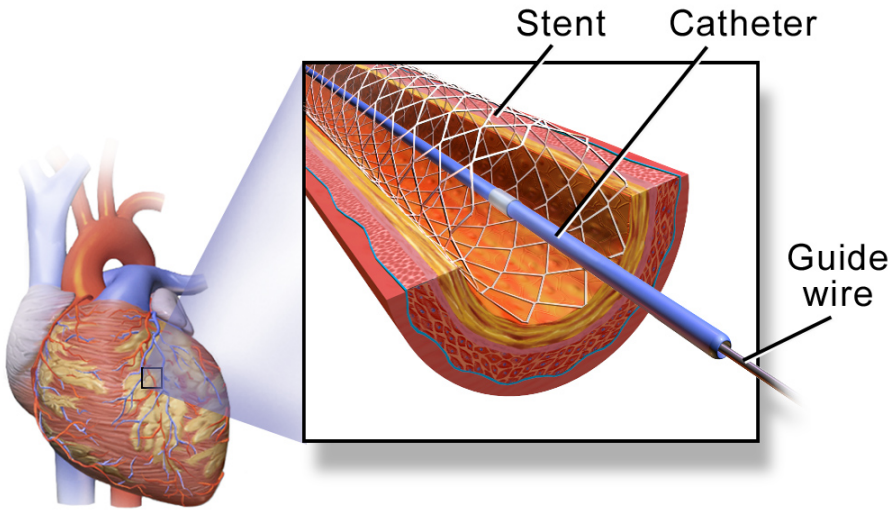
Inside the Cath Lab: Step by Step



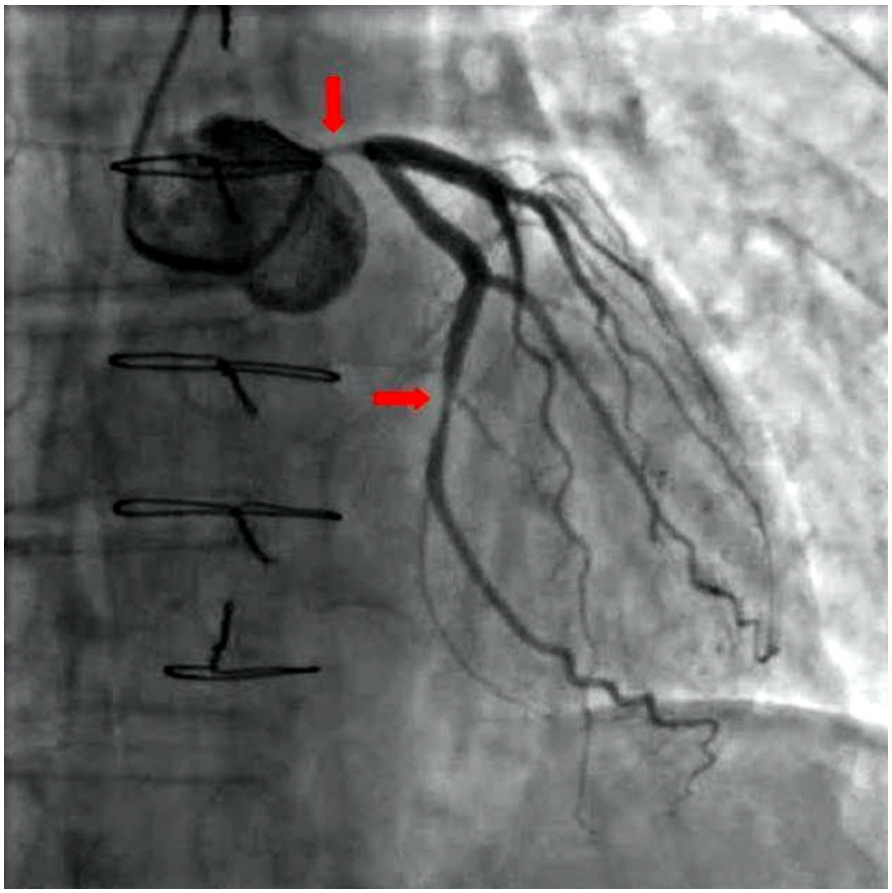
Most patients are awake. The procedure usually takes 30 to 90 minutes.

The cath-lab procedure in six steps. Most patients are awake the whole time. Local numbing means the entry at the wrist or groin is not painful.

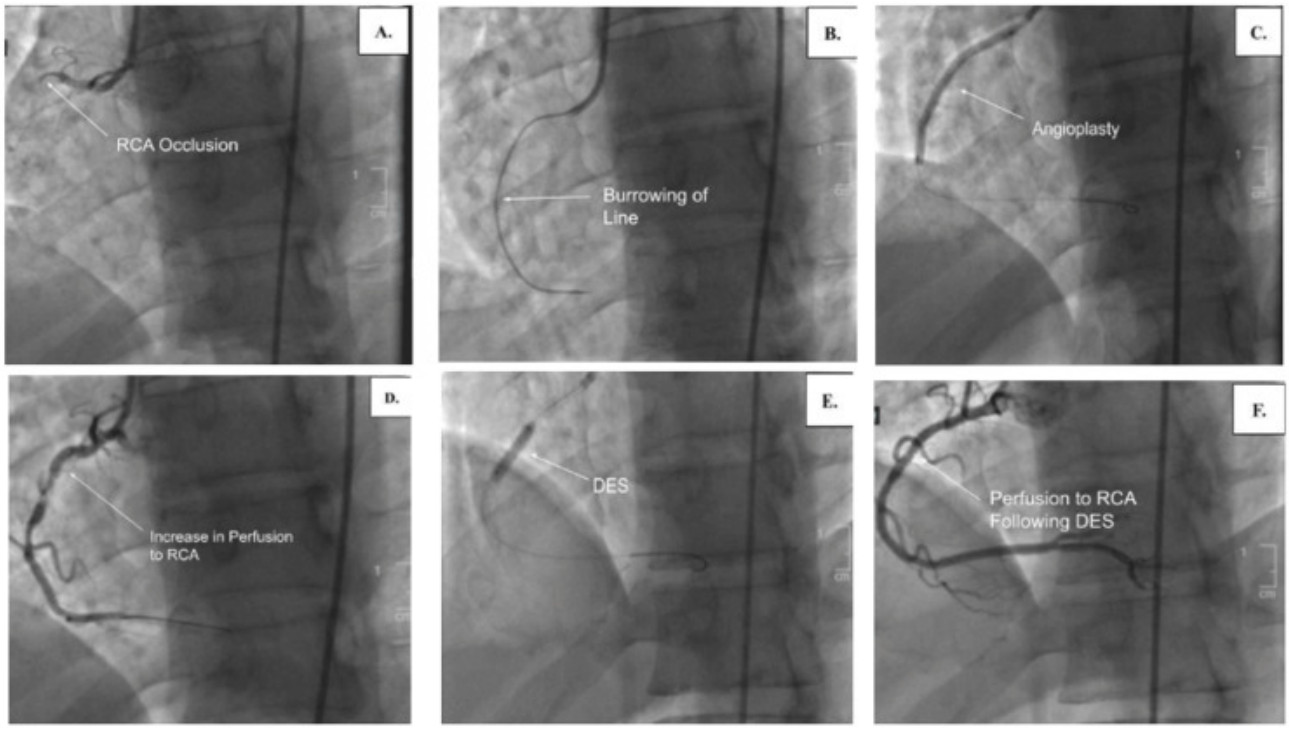
Stent in Coronary Artery



Anatomic illustration of percutaneous coronary intervention: the narrowed artery, the balloon-tipped catheter advanced into the lesion, the balloon inflated with the stent expanded, and the restored open lumen with the stent in place. Illustration: BruceBlaus / Blausen Medical via Wikimedia Commons (CC BY 3.0).



A real coronary angiogram showing a high-grade narrowing in a heart artery - the kind of lesion treated with a stent. Image credit: Pantaleo et al. via Wikimedia Commons (CC BY 2.0).



A real six-panel angiogram sequence from an actual procedure: (A) the blocked artery, (B) the wire crossing the blockage, (C) the balloon opening it, (D) blood flow returning, (E) the drug-eluting stent (DES) being placed, and (F) full blood flow restored after the stent is in. Image: Celebi TB et al., Cureus 2025 (CC BY 4.0).

Where the Thin Tube Goes In: Wrist vs Groin

Radial (Wrist) - Preferred

- Lower chance of bleeding
- Sit up and walk soon after
- Same-day discharge often possible
- Small wristband holds pressure

Femoral (Groin) - When Needed

- Used when wrist access is hard
- Bigger artery for complex tools
- Lie flat 2 to 6 hours after
- Slightly higher bleeding risk

Wrist (radial) access is preferred today - lower bleeding, faster recovery, and same-day discharge are common. The groin (femoral) is used when the wrist is not usable or when bigger tools are needed.

Diagnostic Tools Inside the Artery

Tool	What it does	Brand example(s)
FFR / iFR (pressure wire)	Measures pressure across the narrowing to see if flow is really limited	Abbott PressureWire X; Philips Verrata
IVUS / OCT (intravascular imaging)	Sound or light probes show the artery wall from inside; size the stent, find calcium	Boston Scientific OptiCross; Abbott Dragonfly

Plaque-Modification Tools for Heavily Calcified Lesions

Tool	What it does	Brand example(s)
Rotational atherectomy	Diamond burr at 140,000-180,000 RPM shaves calcified plaque into microparticles	Boston Scientific Rotablator
Orbital atherectomy	Eccentric crown with orbital motion; differential cutting targets calcium only	CSI Diamondback 360
Intravascular lithotripsy (IVL)	Sonic shock-wave pulses crack calcium without injuring soft tissue	Shockwave Medical Coronary IVL
Excimer laser (308 nm UV)	Xenon-Chloride gas laser vaporizes plaque, in-stent narrowing, or clot	Spectranetics / Philips ELCA
Solid-state laser (355 nm UV)	Newer 355 nm UV laser with broader plaque targeting	AngioDynamics Auryon; Eximo

The Day of the Procedure - What to Expect

- You will be asked not to eat for a few hours before. Take most of your usual medicines with a sip of water unless told otherwise.
- An IV is placed in the other arm. Light sedation through the IV keeps you relaxed but awake.
- The wrist or groin is washed and numbed with a small shot - this stings briefly, then the rest is not painful.
- You may feel a warm flush when the dye is injected. It is harmless and passes in seconds.
- When the balloon is inflated, some patients feel a brief chest pressure like the symptoms they came in with. It passes quickly.
- After the stent is placed, the team holds pressure or uses a wristband or closure device. Then you rest in the recovery area.

Recovery After Radial (Wrist) Access

- A pressure wristband stays on for 1 to 2 hours, then it is slowly let down. The puncture seals from the inside.
- Many patients sit up, eat, and walk within an hour or two.
- Most go home the same day if the procedure was elective and went smoothly.
- Keep the wrist dry for 24 hours. No heavy lifting (over 10 pounds) for 24 to 48 hours, and no driving for 24 hours.
- A small bruise or lump is normal. A growing lump, severe pain, or a cold and pale hand is not - call us or come in.
- Most return to office work in 1 to 3 days and to physical work in 1 to 2 weeks.

Recovery After Femoral (Groin) Access

- You will lie flat for 2 to 6 hours so the groin entry seals safely. A closure device sometimes shortens this.
- Walking starts after the rest period. Most patients stay overnight in the hospital.
- No heavy lifting (over 10 pounds) and no driving for 3 to 5 days. Avoid stairs the first day if possible.
- A small bruise is normal. A growing lump, severe pain, or a cold and pale leg is not - call us or come in.
- Avoid sex, swimming, and tub baths for about a week, until the entry has fully sealed.
- Most return to office work in 3 to 7 days and to physical work in 2 to 3 weeks.

Do not stop the two blood-thinning pills on your own. Stopping early is the most common cause of a sudden stent clot, which can cause a heart attack or death. Always call us before stopping - even for dental work or surgery. Most procedures can be done safely without stopping.

Risks, Benefits, and Alternatives

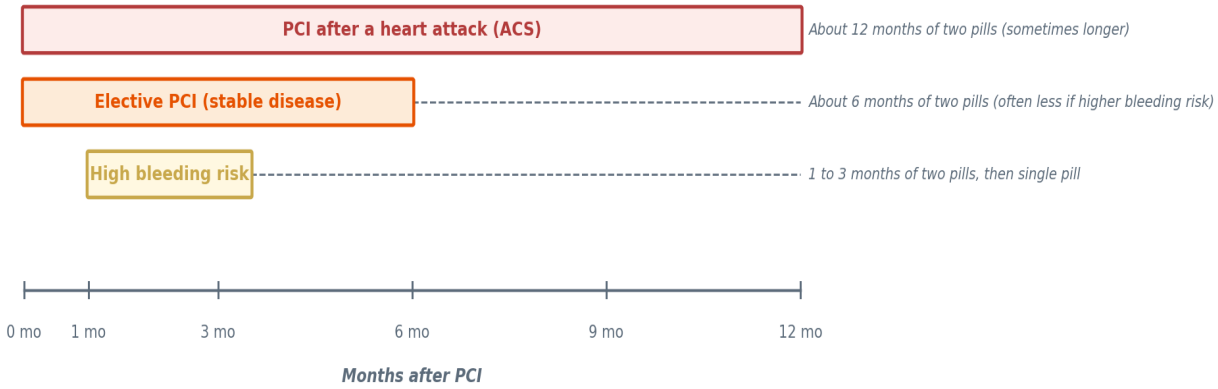
Every choice has trade-offs. Use this table to start the shared decision conversation.

Option	Risks	Benefits	Alternatives
PCI with a drug-coated stent for stable angina	Small risks of bleeding, dye reaction, vessel injury, and very rarely heart attack or stroke. Symptoms can return if the artery narrows again.	Eases chest pain and improves quality of life for many patients. Lets some patients exercise more comfortably and worry less about angina.	Optimal medical therapy alone (medicines + lifestyle). The ISCHEMIA trial showed medicines alone do not raise the chance of death or heart attack for stable disease.
Primary PCI for STEMI (fully blocked artery)	Procedure risks as above. Time pressure - the artery must be opened fast.	Opens the artery within minutes. Saves heart muscle and improves survival when done within 90 minutes of hospital contact.	Clot-busting medicine (fibrinolysis) when a cath lab is too far away. Then transfer for cath.
PCI vs CABG (open-heart surgery) for multi-vessel disease	PCI is less invasive. The arteries opened with stents may need repeat work later. PCI may be less effective for complex multi-vessel disease, especially with diabetes.	CABG often gives more complete fixes and better long-term results for left-main disease and for diabetes with multi-vessel disease.	Sometimes a hybrid plan: some arteries treated with PCI, others with surgery.
Drug-eluting stent (DES) vs bare-metal stent (BMS)	DES requires the two blood-thinning pills for longer. BMS allows shorter dual therapy.	DES lower the chance of restenosis (narrowing again) without raising the chance of death or heart attack (NORSTENT trial). Today, DES are the default.	BMS in select patients who must stop the second blood thinner quickly (for example, urgent non-cardiac surgery).

Option	Risks	Benefits	Alternatives
Radial (wrist) vs femoral (groin) access	Radial can be harder when the wrist artery is small. Sometimes the team has to switch to the groin partway through.	Radial has lower bleeding and access-site complications. In ACS, radial access lowers death (MATRIX). Faster recovery and same-day discharge are common.	Femoral for complex cases needing larger tools, or when the wrist artery is not usable.
Dual antiplatelet therapy (DAPT) duration	Higher chance of bleeding - gum bleeding, bruising, and, rarely, serious bleeding in the stomach or brain.	Keeps the stent open and lowers the chance of clots forming on the stent. For ACS, 12 months is the usual plan.	Shorter courses (1 to 3 months of two pills, then single therapy) for patients at high bleeding risk (MASTER DAPT, TWILIGHT).

Dual Antiplatelet Therapy (DAPT) - How Long the Two Pills Last

Two pills (aspirin + a second blood thinner) keep new clots from forming on the stent. Solid bar = two pills. Dashed line = single pill from then on.



How long the two blood-thinning pills last depends on why the stent was placed and your bleeding risk. The team tailors the plan to you.

PCI vs Medicines Alone for Stable Disease - the ISCHEMIA Lens

- The ISCHEMIA trial (2020) followed over 5,000 patients with stable coronary disease and moderate-to-severe ischemia.
- Half went straight to angiogram and stenting (or surgery if needed) plus medicines. The other half started with medicines alone, with cath only if symptoms got worse.
- Over 3 years, the two groups had the same chance of death or heart attack.
- The PCI group had better quality of life and fewer angina symptoms - especially patients with daily or weekly angina.
- Translation: for stable disease, PCI is mostly about symptoms and quality of life. For heart attacks and unstable chest pain, PCI saves lives.
- The decision belongs to you. The team will explain your specific arteries, your symptoms, and the trade-offs.

PCI vs CABG — When PCI, When CABG, When Either

- PCI is usually preferred for single-vessel disease, focal lesions, prior CABG with failing grafts, very high surgical risk, and patient preference for less-invasive recovery.
- CABG is usually preferred for left-main disease + complex multivessel disease, diabetes + multivessel disease (FREEDOM trial), severely reduced heart pump + extensive disease (STICH trial), or complex anatomy where PCI is unlikely to succeed.
- Equipoise — the gray zone — exists for intermediate-complexity multivessel disease (SYNTAX score 23-32), preserved heart pump, no diabetes. Here, patient values weigh heavily: do you prefer faster recovery (PCI) or a more durable result (CABG)?
- The Heart Team meets for these cases — an interventional cardiologist, a cardiothoracic surgeon, and a heart-failure specialist look at YOUR angiogram together and recommend the best path for YOU.
- Key trials behind the guidelines: SYNTAX (overall complexity), FREEDOM (diabetes), EXCEL and NOBLE (left main — still debated), STICH (low EF), ISCHEMIA (stable disease vs medicines alone).
- Sometimes a hybrid plan is used: some arteries treated with PCI, others with surgery in a staged or combined procedure.
- Recovery: PCI is usually 1-2 weeks. CABG is 6-12 weeks. CABG is open-heart surgery; PCI is not.

Bleeding Risk Tiers - How DAPT Duration Is Decided

Standard risk	Intermediate risk	High bleeding risk
• No prior major bleeding	• Older age or moderate kidney disease	• Active bleeding or very low platelets
• Normal or near-normal kidneys	• On a daily blood thinner for AFib	• Recent or planned major surgery
• Younger or healthy older adult	• Past gastrointestinal bleed treated and resolved	• Severe kidney disease or on dialysis
• Two pills for the usual 6 to 12 months	• Often a shorter or tailored DAPT plan	• Often 1 to 3 months of two pills, then one

Common Misconceptions

Myth	Reality
A stent cures heart disease.	A stent only treats one narrowed spot. The disease - plaque buildup - is in the whole artery system. Medicines and lifestyle are what keep new blockages from forming.
Once the stent is in, I can stop the medicines.	The two blood-thinning pills are how the stent stays safe in the first months. Stopping early is the most common cause of a sudden stent clot.
I will be able to feel the stent.	Stents are small and soft. Once the artery heals over them, you cannot feel them. You will not set off airport metal detectors.
MRI scans are not safe with a stent.	Almost all modern coronary stents are MR-conditional - they are safe in standard 1.5T and 3T MRI scanners, even soon after placement. Always tell the MRI team which stent you have.
A stent will fix my chest pain right away.	For unstable chest pain or a heart attack, yes. For stable angina, the symptom benefit is real but smaller than people expect (ORBITA), and may take time.
A stent will help me live longer no matter what.	For stable disease, stents do not always add years to life vs medicines alone (ISCHEMIA). For a heart attack or unstable angina, a stent does save lives.
A stent is forever - I will need it replaced.	Stents are not replaced. The artery wall heals over the stent in weeks to months. The stent stays for life.
Going through the wrist is more dangerous than the groin.	It is the opposite. Wrist (radial) access has less bleeding and lower complication rates, and it gets people up and walking faster. It is the preferred approach today.

MRI scans are safe with a modern coronary stent. Almost all coronary stents made in the last 15 years are MR-conditional at standard 1.5T and 3T - even right after placement. Tell the MRI team which stent you have and bring your stent card if you have one.

Possible Complications

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

Where / What	What Can Happen
Bleeding at the wrist or groin	The most common complication. Usually small - a bruise or a lump that goes away in a week or two. Larger bleeds are less common with wrist access. The team checks the entry before you go home.
Contrast (dye) effect on the kidneys	The x-ray dye can stress weak kidneys for a few days. Most cases are mild and improve on their own. The team uses the smallest dye amount possible and gives extra fluids when needed.
Dissection or perforation of the artery	Rarely, the artery wall can tear or be poked through. Most are handled in the same procedure with another stent or, very rarely, surgery.
Heart attack during the procedure	A side branch can be blocked when a stent is placed in a main artery. Usually small, but troponin levels rise. Treatment is given in the same setting.
Stroke	Rare (less than 1 in 100). Can happen when bits of plaque or clot break off and travel to the brain.
Arrhythmias	Brief abnormal heart rhythms can happen during the procedure. Most settle on their own. Some need a brief shock or a medicine.
In-stent restenosis (narrowing again over time)	About 5 to 10 with drug-coated stents over years - less than with older bare-metal stents. Treated with a balloon or a second stent.
Stent thrombosis (sudden clot in the stent)	Rare but serious. Most often happens early when the two blood thinners are stopped too soon. This is why the medicines are so important.
Allergic reaction to the dye	Rare. Tell the team about any prior dye reaction, severe shellfish allergy, or asthma. Pre-medication lowers the risk.

Recovery Timeline - What to Expect After a Stent

When	What is typical	What to watch for
First 24 hours	Bruising at the wrist or groin. No heavy lifting or driving.	Bleeding that will not stop with 10 minutes of pressure - call 911
Day 2 to 7	Walking encouraged. Office work usually possible by day 3 to 5.	Fever, redness, or drainage at the entry; new chest pain
Week 2 to 4	Most return to normal activity. Cardiac rehab usually starts.	Chest pain like before the stent, shortness of breath at rest
Month 1 to 12	DAPT (two blood thinners) continues for 6 to 12 months in most.	Easy bruising or bleeding; do not stop the pills without calling us
After 12 months	Most are on a single blood thinner (aspirin) plus the heart medicines for the long run.	New angina-like symptoms; questions before any surgery or dental work

PCI Complication Rates — What the Numbers Mean

Complication	Rate (modern PCI)	Context
Major bleeding (radial)	< 0.5%	Wrist access — the preferred approach today
Major bleeding (femoral)	1 - 3%	Higher than radial; reserved for complex tools
Acute stent thrombosis (within 30 days)	0.5 - 1%	Modern drug-eluting stents. Almost always linked to early DAPT stop.
Restenosis (5 years)	5 - 10% DES / 20 - 30% BMS	DES (drug-eluting) is much lower than old bare-metal stents
Contrast-induced kidney injury	5 - 10% (CKD) / < 1% (normal kidneys)	Hydration + minimal contrast lower the risk
Peri-procedural stroke	0.1 - 0.3%	Rare. Slightly higher in left-main or complex PCI.
Coronary perforation	< 0.5%	Rare. May need balloon tamponade or covered stent.
Emergent CABG	< 0.5%	Rare with modern technique. Reserved for failed PCI of critical anatomy.
In-hospital mortality (all PCI)	1 - 2% overall / 5 - 10% in STEMI or shock	Higher acuity = higher risk. Source: NCDR CathPCI Registry.

Restenosis and Stent Thrombosis - Knowing the Difference

- Restenosis means the artery slowly narrows again inside the stent over months or years.
- With drug-coated stents, restenosis happens in about 5 to 10 patients out of 100 over the years - less than with old bare-metal stents.
- Restenosis usually feels like the angina that came back. It is treated with a balloon or a second stent.
- Stent thrombosis means a sudden clot forms inside the stent. It is rare but serious - usually presents as a new heart attack.
- Stent thrombosis is most common in the first 30 days, almost always when the two blood thinners are stopped too soon.
- This is why we ask you to never stop the two blood thinners on your own - even for dental work or other surgery. Call us first.

Points to Know

If you remember nothing else, remember these key points.

- Take the two blood-thinning pills exactly as prescribed - especially in the first months. Do not stop without calling us, even before dental or other procedures.
- Keep the wrist or groin entry clean and dry for the first 24 to 48 hours. Bruising and a small lump are normal.
- No heavy lifting (over 10 pounds) and no driving for 24 hours after radial access; up to a few days after femoral access.
- Walking the next day is encouraged. Most patients can return to office work in a few days and to physical work in 1 to 2 weeks.
- Statins, blood pressure medicines, and other heart medicines are not optional after a stent. Each one protects a different way.
- Cardiac rehab is one of the most powerful treatments. Most insurance covers it after a heart attack or stent.
- MRI scans are safe with all modern coronary stents. Tell the MRI team which stent you have and bring your stent card if you have one.
- Call us about any new chest pain, shortness of breath, fainting, bleeding that will not stop, or a wound that is red, swollen, or draining.

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.

- Chest pressure or pain like before the stent, especially in the first weeks - call us right away. Severe or prolonged chest pain - call 911.
- Sudden shortness of breath, fainting, or a fast or irregular heartbeat - call 911.
- Bleeding at the wrist or groin entry that will not stop with 10 minutes of firm pressure - call 911.
- A sudden cold, pale, painful hand or leg, or new tingling and weakness on the side of the entry - call us or come in the same day.
- A wound at the entry that becomes red, swollen, warm, or starts draining - call us.
- Bleeding gums, easy bruising, black or bloody stools, or coughing up blood while on the two blood thinners - call us right away.
- Missed doses of the blood thinners or trouble paying for them - call us so we can adjust the plan. Do not just stop.
- Questions about return to work, sex, exercise, driving, or upcoming procedures - call us; these are normal and important.

Office: (727) 943-5200

Angioplasty Is Part of a Bigger Picture - Where to Read Next

- A stent fixes one spot. The disease that caused it - and the medicines and habits that keep new spots from forming - are covered in our other guides.
- How chest pain is sorted out before deciding on a stent: see the Chest Pain guide.
- The artery disease behind most stents: see the Coronary Artery Disease guide.
- Predictable chest pain with effort - when a stent is one option: see the Stable Angina guide.
- Heart attacks - the emergency end of the same disease: see the Heart Attack (ACS) guide.
- A non-invasive picture of the heart arteries: see the Coronary CT Angiography guide.
- Artery spasm as a less common cause of chest pain: see the Coronary Vasospasm guide.
- A torn artery (more often in younger women): see the SCAD guide.
- What rehab looks like after a stent or heart attack: see the Cardiac Rehabilitation guide.
- When the heart pumping is weak after a heart attack: see the HFrEF guide.

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 - Percutaneous Coronary Intervention - Plain-language overview of PCI from the AHA, including what to expect during and after.
- Cleveland Clinic - Percutaneous Coronary Intervention - Patient-friendly overview of how angioplasty and stents work, recovery, and what to expect.
- Mayo Clinic - Coronary Angioplasty and Stents - Symptom-focused overview, the procedure itself, recovery, and risks.
- NHLBI - Percutaneous Coronary Intervention - US National Heart, Lung, and Blood Institute overview of PCI as part of coronary heart disease treatment.
- MedlinePlus - Angioplasty - US National Library of Medicine consumer overview of angioplasty with stent placement.
- AHA - Cardiac Rehabilitation - Why cardiac rehab matters and what to expect from a 12-week program.

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.

- 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization (Lawton et al., Circulation 2022; PMID 34882435) *[Guideline]*
  Primary framework for revascularization choices: PCI vs CABG, radial-first access, complete vs culprit-only revascularization, and DES vs BMS recommendations.
- 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease (Virani et al., Circulation 2023; PMID 37471501) *[Guideline]*
  Framework for the role of PCI in chronic coronary disease, the ISCHEMIA-informed framing of stents-vs-medicines, and DAPT duration after elective PCI.
- 2025 ACC/AHA/ACEP/NAEMSP/SCAI Guideline for the Management of Patients With Acute Coronary Syndromes (Rao et al., Circulation 2025; PMID 40014670) *[Guideline]*
  DAPT duration after PCI for ACS, shortened P2Y12 monotherapy for high bleeding risk, and timing of PCI in NSTEMI.
- Initial Invasive or Conservative Strategy for Stable Coronary Disease (ISCHEMIA trial; Maron et al., NEJM 2020; PMID 32227755) *[Clinical Study]*
  Pivotal evidence that elective PCI does not reduce death or MI compared with optimal medical therapy alone in stable disease. Anchors the RBA framing of 'stents do not always add years to life'.
- Radial versus femoral access for coronary angiography and intervention in patients with acute coronary syndromes (RIVAL; Jolly et al., Lancet 2011; PMID 21470671) *[Clinical Study]*
  Foundational evidence for radial-first access: lower bleeding and access-site complications compared with femoral.
- Radial versus femoral access for ST-elevation myocardial infarction (MATRIX; Valgimigli et al., Lancet 2015; PMID 26277246) *[Clinical Study]*
  Confirmed mortality benefit with radial access in ACS patients undergoing PCI. Strengthens the radial-first default.
- Drug-Eluting or Bare-Metal Stents in Patients Undergoing PCI (NORSTENT; Bonaa et al., NEJM 2016; PMID 27572953) *[Clinical Study]*
  Six-year head-to-head trial showing DES reduce repeat revascularization vs BMS without increased death or MI. Modern-era basis for DES-as-default.
- Short-term dual antiplatelet therapy after PCI with a drug-eluting stent (MASTER DAPT; Valgimigli et al., NEJM 2021; PMID 34449183) *[Clinical Study]*
  Evidence that 1-month DAPT followed by single antiplatelet is non-inferior to 12-month DAPT in patients at high bleeding risk. Supports the shortened-DAPT option in the guide.
- Ticagrelor or Clopidogrel Monotherapy after Short-Term DAPT (TWILIGHT; Mehran et al., NEJM 2019; PMID 31475799) *[Clinical Study]*
  Evidence that ticagrelor monotherapy after 3 months of DAPT reduces bleeding without increasing ischemic events in high-risk PCI patients.
- Percutaneous Coronary Intervention in Stable Angina (ORBITA; Al-Lamee et al., Lancet 2018; PMID 29103656) *[Clinical Study]*

Sham-controlled trial showing limited symptom benefit of PCI over medicines in single-vessel stable angina. Frames the patient expectation that 'a stent will fix my symptoms' with nuance.

- Effect of door-to-balloon time on mortality in patients with ST-segment elevation myocardial infarction (Rathore et al., BMJ 2009; PMID 19454739) *[Clinical Study]*
  Evidence base for the door-to-balloon target in primary PCI for STEMI - shorter times mean less muscle loss.
- American Heart Association - Cardiac Procedures and Surgeries (Angioplasty and Stent Placement) *[Patient Education]*
  Plain-language overview of PCI for patients. Used only for framing; numbers re-verified against guideline sources.
- Cleveland Clinic - Angioplasty and Stent Placement *[Patient Education]*
  Patient-friendly overview of how angioplasty and stents work, recovery, and what to expect after.
- Mayo Clinic - Coronary Angioplasty and Stents *[Patient Education]*
  Patient-voice symptom and recovery framing; checked against ACC/AHA 2021 revascularization guideline for clinical specifics.
- NHLBI - Percutaneous Coronary Intervention *[Patient Education]*
  Federally-sourced overview of PCI as part of coronary heart disease treatment.
- MedlinePlus - Angioplasty *[Patient Education]*
  US National Library of Medicine consumer overview of angioplasty with stent placement.
- FDA Withdrawal of Absorb GT1 Bioresorbable Vascular Scaffold (Abbott Vascular, 2017) *[Regulatory]*
  Historical context for bioresorbable scaffolds (BVS): withdrawn from market in 2017 after trial signal of higher stent thrombosis. Drug-eluting metal stents remain the modern default.
- Magnetic Resonance Imaging Safety in Patients with Coronary Stents - ACR/SCMR Position Statement *[Guideline]*
  Evidence base for the misconception that 'a stent prevents MRI scans' - almost all modern coronary stents are MR-conditional and safe at standard field strengths immediately after placement.

About This Guide

Rias KS Ali, MD FACC | Board Certified in Interventional Cardiology & Cardiovascular Disease

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com

Version: 2026-08-16

Reviewer note: Reviewed against the AHA PCI page, the Cleveland Clinic angioplasty page, and Mayo Clinic's coronary angioplasty overview. Ours adds: a step-by-step cath-lab flow with six panels, a wrist-vs-groin comparison anchored in RIVAL and MATRIX, a DAPT-duration timeline by clinical scenario, a bleeding-risk tier card set, an RBA table for PCI vs CABG and PCI vs medicines alone for stable disease (ISCHEMIA), and a 'stent is not the cure' framing that pulls recovery, rehab, and lifestyle into the same plan.

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.

Take This Guide With You

Scan or visit: https://go.riasalimd.com/angioplasty-stents-guide

Online: https://go.riasalimd.com/angioplasty-stents-guide

Office: (727) 943-5200

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com