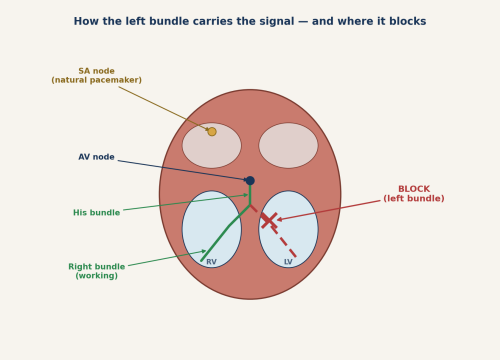
Understanding Left Bundle Branch Block (LBBB)

What It Means, Who Stays Well, and When to Act

A wider QRS is a fingerprint, not a verdict. We trend two numbers and act when they change.



Online: https://go.riasalimd.com/lbbb-guide

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Names & Terms You Will Hear

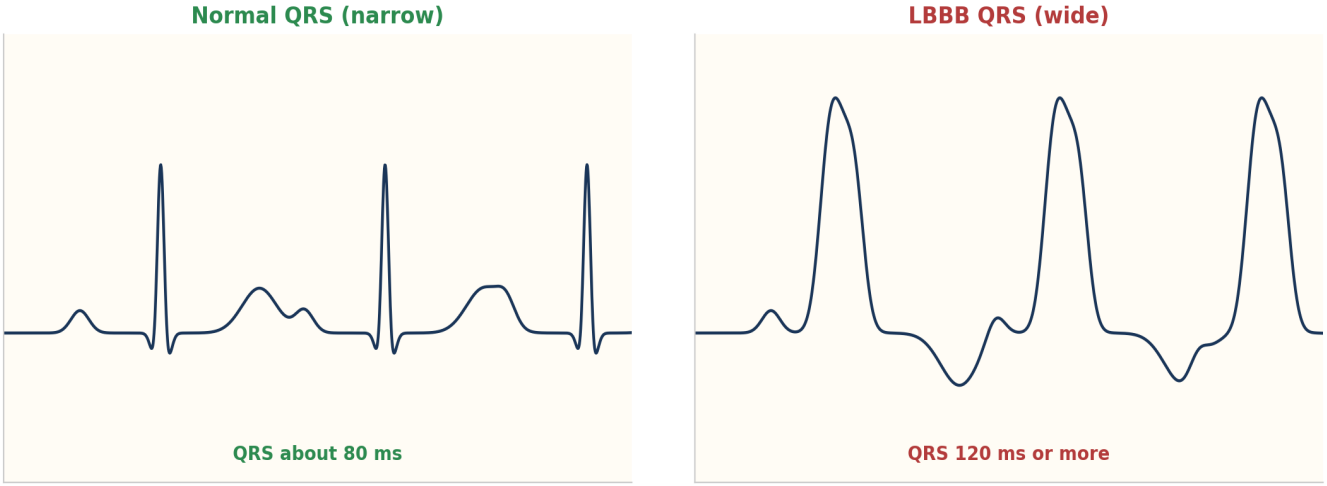
Term	Meaning
LBBB	Left bundle branch block. The short way of writing the same thing.
Complete LBBB	A full block; the QRS is 120 ms or wider on the ECG.
Incomplete LBBB	A partial block; the QRS is a little wider than normal but under 120 ms.
True LBBB (Strauss criteria)	A stricter definition (QRS 140 ms or more in men, 130 ms or more in women, with mid-QRS notching). It best identifies who tends to do well with resynchronization (CRT).
Rate-dependent LBBB	The block appears only at certain heart rates. The QRS is narrow at one rate and wider at another.
Intermittent LBBB	An umbrella term for blocks that come and go. Rate-dependent LBBB is the most common kind.
Tachycardia-dependent (phase-3) LBBB	The block shows up when the heart speeds up, then goes away as the rate slows.
Bradycardia-dependent (phase-4) LBBB	Less common; the block shows up only when the heart slows down.
LBBB-induced cardiomyopathy	A weak heart caused by long-standing LBBB itself, when no other cause is found. Often improves with CRT.

The two numbers we trend. A wide QRS on the ECG and the LVEF on the echo are the two numbers that drive decisions in LBBB. If both stay steady and you feel well, the plan is steady follow-up. If the LVEF drops, we add medicines, and if it stays low we consider CRT.

What Is Left Bundle Branch Block (LBBB)?

- Your heart has its own wiring. The signal starts at the top, drops through the AV node, then runs down two wires (bundles) to the right and left ventricles so they pump in time.
- In LBBB, the left wire is blocked. The signal has to take a longer route through the muscle to reach the left ventricle.
- Because the left side takes longer to fire, the QRS on the ECG looks wider and shaped a certain way.
- Most adults with LBBB feel completely normal and have a normal pump (a normal LVEF on the echo).
- LBBB by itself is usually not painful and does not change how the heart feels day to day.
- It can be old (present for years) or brand new on a follow-up ECG. New LBBB always gets a closer look.

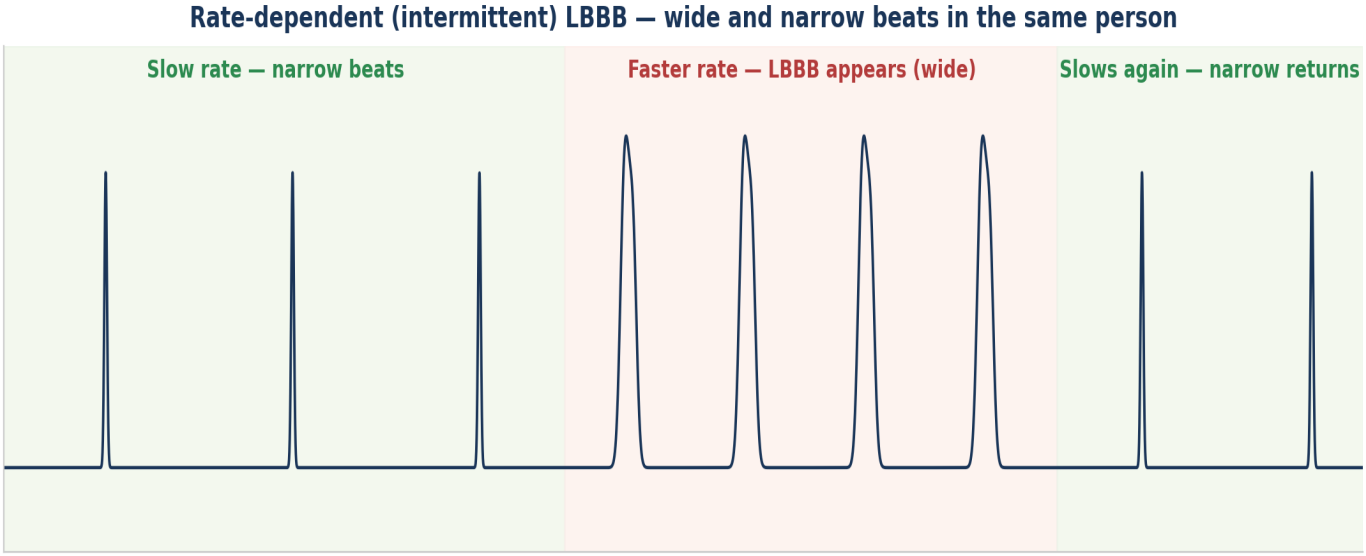
What a narrow versus wide QRS looks like on the ECG



A normal QRS is narrow and sharp. In LBBB the QRS is wider and notched because the left side fires late.

Why It Matters

- LBBB is a marker. It can point to high blood pressure, coronary artery disease, a heart valve problem, or a weakening heart muscle.
- About 1 in 100 adults in the general population has LBBB. The number rises with age and reaches roughly 5 to 8 in 100 by age 80.
- Most people with isolated LBBB and a normal LVEF feel well and stay well for many years.
- Over time, a small share of people with persistent LBBB develop a weaker heart from the block itself — the left side is no longer beating in time with the right.
- When the heart weakens this way and no other cause is found, the entity is called LBBB-induced cardiomyopathy. The pump can often recover when the two sides are resynchronized (CRT).
- Heart failure is more common over the years in people with LBBB than in those with a normal ECG. The two numbers we track — QRS width and LVEF — help us catch this early.



Rate-dependent LBBB: the block appears only when the rate is faster (red zone), then disappears when the rate slows down again.

Asymptomatic LBBB With a Normal LVEF — the Common Picture

- Most people with LBBB found on an ECG feel completely well and have a normal pump on the echo (LVEF 50 percent or higher).
- Long-term studies show many of these people stay well for many years.
- There is no drug treatment for the LBBB itself. We treat blood pressure, cholesterol, and other risk factors as usual.
- An echo at the time LBBB is first found, then every 1 to 2 years, lets us catch any quiet drop in the LVEF early.
- An up-to-date copy of the ECG should be kept with your records. Any future provider should compare new strips to this one before calling a change new.

Intermittent and Rate-Dependent LBBB

- Some people have a left bundle that conducts normally at slow rates but blocks at faster rates. The same ECG can show narrow beats then wide beats minutes apart.
- Tachycardia-dependent (phase-3) LBBB is the common kind: as the heart speeds up, the left bundle cannot keep up and the QRS widens. As the rate slows, the block goes away.
- Bradycardia-dependent (phase-4) LBBB is less common; the block shows up only at slow rates.
- Most intermittent LBBB is benign in people with a normal heart pump and no symptoms.
- When the block appears, an acute heart attack can look similar — chest pain at any rate is still an emergency.
- Treatment is usually surveillance plus addressing the reason the rate is rising (anemia, dehydration, hyperthyroidism, untreated apnea, deconditioning).

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
Older age	Common after the 60s. About 1 in 100 adults overall; 5 to 8 in 100 by age 80.
High blood pressure (hypertension)	Years of high pressure stiffen and thicken the heart and damage the wiring.
Coronary artery disease (CAD)	A past or silent heart attack can scar the left wire.
Aortic stenosis	A tight aortic valve can press on the conduction system, especially after TAVR.
Dilated cardiomyopathy	A stretched, weakened heart muscle damages the left wire and dyssynchrony makes things worse.
Infiltrative or inflammatory disease	Cardiac sarcoidosis, amyloidosis, Lyme carditis, or Chagas disease can scar the wiring.
After heart surgery or TAVR	Valve replacement (especially TAVR), septal myectomy, and some congenital repairs can injure the left bundle.
Sclerodegenerative disease (Lenegre or Lev disease)	Slow, age-related fibrosis of the wiring itself. Often the answer when no other cause is found.
Congenital LBBB	Rare; present from birth and usually benign when the heart is otherwise normal.

Surveillance plan — how often we check the ECG and echo

Your situation	ECG cadence	Echo cadence	What we watch for
Asymptomatic LBBB with a normal LVEF	Every 1 to 2 years	Every 1 to 2 years	QRS width and LVEF stay steady. No new symptoms.
Intermittent or rate-dependent LBBB	Every 1 to 2 years (sooner if symptoms)	Every 1 to 2 years	Symptoms at the faster rate; any drop in LVEF.
Borderline or falling LVEF (between 40 and 50 percent)	Every 6 to 12 months	Every 6 to 12 months	Trend in LVEF; signs of heart failure; need for GDMT.
LVEF of 35 percent or lower with persistent LBBB	Every 3 to 6 months	Every 3 to 6 months	Response to GDMT; CRT candidacy when symptoms remain.

Treatment Options

- There is no drug that treats LBBB itself. The strip of paper looks different, but no pill makes the QRS narrower.
- We treat the cause. Control blood pressure. Treat coronary disease. Treat the valve when needed. Treat sleep apnea when present.
- If the LVEF stays normal and you feel well, we do not start medicine just because of the LBBB. We watch with regular ECG and echo.
- If the LVEF starts to drop, we begin guideline-directed heart failure medicines (GDMT): an ACE inhibitor or ARB or ARNI, a beta-blocker, a mineralocorticoid receptor antagonist, and an SGLT2 inhibitor.
- If the LVEF is 35 percent or less and you have symptoms despite GDMT — and the LBBB persists — CRT becomes a consideration.
- CRT (resynchronization) places a pacing wire to the left side of the heart so the two sides beat in time again. It can reverse LBBB-induced weakness in many people.
- Some centers offer left bundle branch area pacing or His-bundle pacing as alternatives or partners to standard CRT.
- If you have new fainting, we may use a Holter monitor or an implantable loop recorder to look for a more dangerous heart block.

CRT eligibility at a glance (with persistent LBBB and symptoms despite GDMT)

LVEF	QRS width	Recommendation strength	Device
35 percent or lower	150 ms or more	Strong (Class I)	CRT-D if primary-prevention ICD is indicated; CRT-P otherwise
35 percent or lower	130 to 149 ms	Reasonable (Class IIa)	CRT-D or CRT-P, individualized
36 to 50 percent	Any width	Not routine	Continue GDMT; consider only in selected cases

LBBB-Induced Cardiomyopathy — Weakness From Dyssynchrony Alone

- In long-standing LBBB, the left side fires later than the right. Over years, this off-time pumping can weaken the heart even when no other cause is found.
- This entity is called LBBB-induced cardiomyopathy. The diagnosis is made after we look for and rule out coronary disease, valve disease, infiltrative disease (like sarcoidosis or amyloidosis), and other causes.
- Cardiac MRI is helpful when the cause is unclear; it can find inflammation, scar, or infiltration that the echo cannot see.
- Roughly 1 in 3 people with long-standing LBBB develop some drop in LVEF over many years. Most are mild; a smaller share progress to symptomatic heart failure.
- When the heart is weak from dyssynchrony alone, resynchronization (CRT) can return the pump toward normal in many people. This recovery is well documented in the trials and series.
- The earlier we catch it, the better the recovery tends to be — another reason serial echos matter.

CRT-P versus CRT-D — Pacemaker, Defibrillator, or Both

- CRT (cardiac resynchronization therapy) uses a pacing wire that reaches the left side of the heart, so the right and left sides beat in time again. It is the part of the device that addresses the LBBB.
- CRT-P is the pacemaker-only version. It resynchronizes the heart but does not deliver shocks.
- CRT-D is CRT plus a defibrillator. It resynchronizes AND can stop a dangerous fast rhythm with a shock if one occurs.
- CRT-D is chosen when a primary-prevention ICD is also indicated — for example, LVEF of 35 percent or lower with symptomatic heart failure despite GDMT, and a reasonable life expectancy.
- CRT-P is chosen when CRT will help the heart but the person does not need a defibrillator — for example, an older patient with LBBB-induced cardiomyopathy without ventricular arrhythmias, or someone who declines a defibrillator.
- Left bundle branch area pacing and His-bundle pacing are newer options that pace the natural wiring directly. In selected patients they can replace or partner with the standard CRT lead.
- Around 7 in 10 people with classic LBBB plus a wide QRS and a low LVEF improve with CRT, and many regain a near-normal pump.

When to call 911. Faint or near-faint, chest pain or pressure that does not go away, severe shortness of breath, or a very slow pulse with lightheadedness. If someone collapses and is not breathing normally, **start Hands-Only CPR** — push hard and fast in the center of the chest, about 100 to 120 pushes a minute, the beat of the song *Stayin' Alive* — and send someone for an AED. An AED checks the heart first and will not shock a normal rhythm, so it is safe to use. The free PulsePoint app shows the nearest AED.

Comfort Measures at Home (No Medication Needed)

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

- Stay active. Regular walking, biking, or swimming is safe and helps the heart.
- Get blood pressure to goal at home — the single biggest thing you can do for your heart wiring.
- Aim for a healthy weight and a Mediterranean-style diet (more vegetables, fruit, fish, olive oil; less processed food and added salt).
- Limit alcohol. Heavy drinking weakens the heart muscle.
- Treat sleep apnea if you have it. Untreated apnea drives blood pressure and arrhythmias.
- Do not smoke or vape. Tobacco is a major driver of coronary disease.
- Carry an up-to-date copy of your most recent ECG. New providers should compare any future ECG with this one.

Risks, Benefits, and Alternatives

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

Option	Risks	Benefits	Alternatives
Watchful waiting (asymptomatic + normal LVEF)	Misses a slow drop in LVEF if you skip follow-up; rarely, can mask sarcoidosis or another cause that needs treatment.	No procedure, no daily pill for the LBBB; very low short-term risk in the asymptomatic, normal-pump pattern.	Periodic ECG and echo surveillance; treat the cause; ILR if there is unexplained fainting.
Periodic surveillance (ECG + echo)	Catches early LVEF drop and tracks QRS width; cost and time of yearly visits.	Catches problems early when treatment works best.	Symptom-prompted testing only (not recommended); cardiac MRI if sarcoidosis or another infiltrative cause is suspected.
Guideline-directed medicines (GDMT)	Side effects (low BP, dizziness, cough, high potassium); needs lab and BP checks.	Slows or reverses a falling LVEF; cuts hospital stays and prolongs life.	Treat the cause first (BP, CAD, valve); CRT when LVEF stays at 35 percent or lower despite GDMT.
CRT-P (resynchronization, pacemaker only)	Procedural risk (about 1 to 3 in 100): bleeding, pneumothorax, lead problem, infection.	Many people with LBBB-induced cardiomyopathy regain a normal LVEF; fewer heart failure hospital stays.	CRT-D when a defibrillator is also indicated; left bundle area pacing in selected centers.
CRT-D (CRT plus defibrillator)	All the CRT-P risks plus rare inappropriate shocks.	Resynchronization and protection from sudden death when the LVEF is 35 percent or lower and primary-prevention rules are met.	CRT-P when no defibrillator indication; medical therapy alone if a person declines a device.

Option	Risks	Benefits	Alternatives
Implantable loop recorder (ILR)	Small device under the skin; rare bleeding or skin reaction.	Catches a hidden, more dangerous heart block when fainting is not explained.	Holter or 14- to 30-day external patch monitor first, then ILR if those are not enough.

Common Misconceptions

Myth	Reality
LBBB means I had a heart attack.	Not by itself. LBBB CAN happen after a heart attack, but most LBBB is from age, high blood pressure, or slow scarring of the wiring — not from an acute attack.
LBBB always needs a pacemaker.	No. Most people with LBBB and a normal LVEF never need any device. A pacemaker or CRT comes up only when the heart slows dangerously, faints occur from block, or the LVEF drops.
If my QRS is wide, I have heart failure.	A wide QRS is just the shape of the beat on the strip. Most people with LBBB do not have heart failure. We track the LVEF on echo to be sure.
Intermittent LBBB is dangerous.	Usually it is not. Rate-dependent LBBB — where the block appears only at faster rates — is most often benign. We do still look for other reasons the rate is rising.
My ECG is permanently abnormal, so something is wrong.	The ECG simply shows the longer route the signal takes. With a normal LVEF and no symptoms, the heart can do its job well for many years.
CRT is just a pacemaker.	CRT is a special pacemaker. It uses an extra lead to pace the left side of the heart so the two sides beat in time. That timing is what helps a weak heart pump better.
There is a pill that fixes LBBB.	No. We treat the causes (blood pressure, coronary disease, valve disease) and, if the heart weakens, we use heart-failure medicines and consider CRT.

Possible Complications

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

Where / What	What Can Happen
Progression to higher-degree AV block	Most people stay stable, but a small fraction develop a slower block over years. Fainting is the most important warning sign and should be reported.
LBBB-induced cardiomyopathy	About 1 in 3 people with long-standing LBBB develop some drop in LVEF over many years, from electrical dyssynchrony alone. CRT often reverses it.
Heart failure	Long-standing LBBB roughly doubles the risk of heart failure over the years compared with people with a normal ECG.
Hiding an acute heart attack on the ECG	LBBB can make a fresh heart attack hard to read on the ECG. The Sgarbossa rules and rapid blood tests (troponin) are used to find it. Treat chest pain as an emergency.
Syncope (fainting) from a slow rhythm	Rare in isolated LBBB. If it happens, monitoring (Holter or implantable loop recorder) is needed to look for a hidden block.

Points to Know

If you remember nothing else, remember these key points.

- Most adults with LBBB and a normal LVEF feel completely well and stay well for years.
- There are two numbers we trend: QRS width on the ECG and LVEF on the echo. New symptoms or a falling LVEF change the plan.
- No daily pill treats LBBB itself. We treat the cause and stay ahead of complications with steady follow-up.
- A small share of people develop LBBB-induced cardiomyopathy from electrical dyssynchrony alone. CRT often reverses it.
- If the LVEF drops to 35 percent or lower with symptoms despite GDMT, CRT-P or CRT-D becomes the right next step.
- Rate-dependent (intermittent) LBBB is usually benign and rarely needs anything beyond surveillance.
- Carry an up-to-date copy of your latest ECG. New providers should compare any future ECG with this one.

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 fainting, near-fainting with chest pain, severe shortness of breath, or chest pressure that does not go away.
- Call 911 for a fast or pounding heartbeat with dizziness, or for a slow pulse with feeling near to passing out.
- Call us if you have new ankle swelling, sudden weight gain (2 to 3 pounds in a few days), or you cannot lie flat without getting short of breath.
- Call us if you tire quickly with activity you used to do easily, or your exercise tolerance drops over a few weeks.
- Call us for new palpitations or skipped beats that bother you, or a steady irregular pulse.
- Call us before any surgery or anesthesia so the team knows about the LBBB.
- Bring a copy of your latest ECG to any new provider. Comparing strips is how new changes are caught.

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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.

- Our Right Bundle Branch Block (RBBB) guide - The other bundle branch block. Its outlook differs from LBBB, so advice about one does not transfer to the other.
- Our Bradycardia and Heart Block guide - Why the heart beats too slowly and when pacing is needed.
- Our Pacemakers and ICDs guide - How traditional pacemakers and defibrillators work.
- Our ICD and CRT-D guide - Resynchronization plus defibrillator: who benefits and what to expect.
- Our Heart Failure (HFrEF) guide - Guideline-directed medicines for a weak heart and when CRT is added.
- Our Advanced Heart Failure guide - What comes next if heart failure keeps getting worse despite medicines and CRT.
- Our Cardiac Sarcoidosis guide - An uncommon but important cause of conduction disease — looks for inflammation in the heart.
- Our Echocardiogram guide - What the LVEF means and how the echo is done.
- Our Implantable Loop Recorder guide - How a long-term monitor finds hidden, brief heart blocks.
- Our Leadless Pacemaker guide - A wireless option for slow heart rhythms.
- Cleveland Clinic — Bundle Branch Block - Plain-language patient page on LBBB and RBBB.
- American Heart Association — Conduction Disorders - Overview of the heart's wiring and the blocks that can affect it.
- Mayo Clinic — Bundle Branch Block - Patient-friendly causes, symptoms, and when to seek care.

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.

- 2018 ACC/AHA/HRS Guideline on Bradycardia and Cardiac Conduction Delay *[Guideline]*
  Primary US guideline for evaluating and managing conduction disease including isolated LBBB; defines surveillance, syncope workup, and pacing thresholds.
- 2021 ESC Guidelines on Cardiac Pacing and Cardiac Resynchronization Therapy *[Guideline]*
  European pacing/CRT guideline: LBBB-specific CRT recommendations (Class I at QRS 150 ms or more, Class IIa 130 to 149 ms with LBBB) and LBB-area pacing context.
- 2023 HRS/APHRS/LAHRS Guideline on Conduction System Pacing *[Guideline]*
  Consensus on left bundle branch area pacing and His-bundle pacing as alternatives or adjuncts to traditional biventricular CRT in LBBB-induced cardiomyopathy.
- Vaillant et al. — Resolution of LBBB-Induced Cardiomyopathy by CRT (JACC 2013) *[Clinical Trial]*
  Landmark series naming LBBB-induced cardiomyopathy as a reversible dyssynchrony entity; documents LVEF recovery after CRT.
- MADIT-CRT — CRT-D in Mild Heart Failure (NEJM 2009) *[Clinical Trial]*
  Pivotal CRT-D trial showing the greatest benefit in patients with LBBB morphology and QRS 150 ms or more.
- RAFT — Cardiac Resynchronization Therapy for Mild-to-Moderate Heart Failure (NEJM 2010) *[Clinical Trial]*
  CRT-D vs ICD: mortality and HF-hospitalization reduction concentrated in wide-QRS LBBB patients.
- BLOCK-HF — Biventricular Pacing for AV Block with HFrEF (NEJM 2013) *[Clinical Trial]*
  When AV block coexists with low EF, biventricular pacing outperforms RV-only pacing; supports CRT-P consideration in LBBB-related dysfunction.
- Strauss et al. — Defining Left Bundle Branch Block in the Era of CRT (Am J Cardiol 2011) *[Clinical]*
  Strict 'true LBBB' criteria (QRS 140 ms male / 130 ms female plus mid-QRS notching) that best identify CRT responders.
- Eriksson et al. — Bundle Branch Block in a General Male Population (Circulation 1998) *[Epidemiology]*
  Long-term cohort data on LBBB prevalence and incidence with age, and the associated cardiovascular mortality signal.
- Imanishi et al. — Prognosis of a Healthy Population With LBBB (Circ J 2006) *[Epidemiology]*
  Cohort showing isolated LBBB in apparently healthy patients carries a low but real risk of progression to LV dysfunction and HF over years.
- Cleveland Clinic — Bundle Branch Block (patient page) *[Clinical]*
  Plain-language overview of LBBB and RBBB causes, evaluation, and follow-up.
- American Heart Association — Bundle Branch Block *[Clinical]*
  AHA patient-facing description of conduction disorders, including bundle branch blocks.
- Mayo Clinic — Bundle Branch Block *[Clinical]*
  Patient-friendly etiology, symptoms, evaluation, and when to seek care for bundle branch block.

About This Guide

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Reviewer note: Reviewed AHA Heart.org, Cleveland Clinic, Mayo Clinic, and UpToDate patient pages. This guide adds the QRS-width and LVEF surveillance protocol, the named entity of LBBB-induced cardiomyopathy from dyssynchrony alone, a rate-dependent / intermittent LBBB section, and the CRT-P versus CRT-D decision logic.

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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