

CLINICALJUDGE™ • MASTER STUDY GUIDE

BRADYCARDIA ARRHYTHMIAS

EKG strip recognition, treatment, and the NCLEX stable-vs-unstable priority for every slow rhythm — sinus & junctional escape, the AV blocks, and ventricular escape rhythms.

NGN NCLEX-RN 2026

CARDIAC • DYSRHYTHMIAS

PHYSIOLOGICAL ADAPTATION

REDUCTION OF RISK POTENTIAL

ACLS BRADYCARDIA

■ Critical / Unstable
 ■ Pathophysiology
 ■ Safe / Stable
 ■ Complications
 ■ Medications
 ■ Patient Education

HOW SLOW RHYTHMS ARISE

SA NODE

Normal pacemaker, 60–100. Slows → sinus bradycardia.



AV NODE

Gatekeeper. Delay/block here → 1st-degree & Mobitz I.



HIS-PURKINJE

Infranodal block → Mobitz II & complete heart block.



ESCAPE PACEMAKERS

Junction (40–60) or ventricle (20–40) take over as backup.

THE GOLDEN NCLEX QUESTION FOR EVERY SLOW RHYTHM: Is the patient *stable* or *unstable*? Treat the **PATIENT**, not the monitor. **UNSTABLE** = hypotension, acutely altered LOC, signs of shock, ischemic chest pain, or acute heart failure. Stable → monitor & find the cause; unstable → act now (atropine → pacing → pressors).

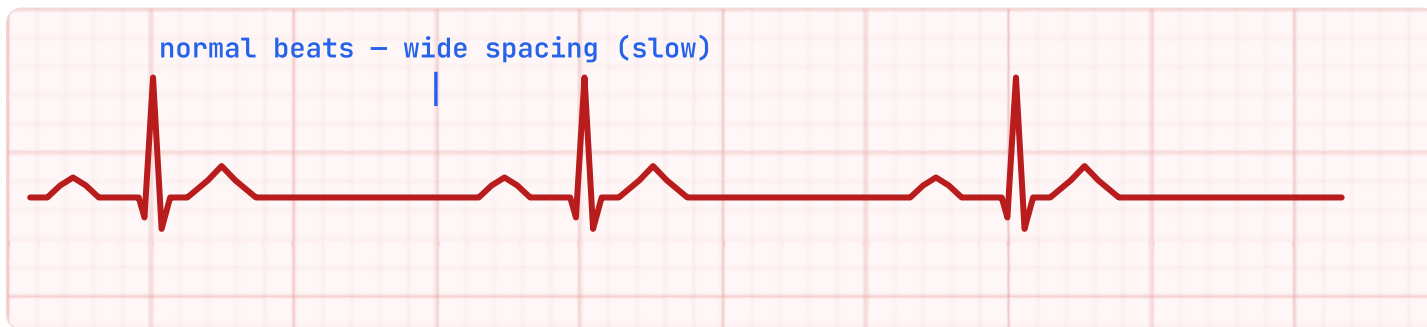
AT-A-GLANCE COMPARISON

RHYTHM	RATE	REGULARITY	P WAVE	PR INTERVAL	QRS	HALLMARK
Sinus Bradycardia	<60	Regular	Normal, 1:1	Normal 0.12–0.20	Narrow	Slow but normal complexes
First-Degree AV Block	Underlying	Regular	Normal 1:1	Long >0.20, constant	Narrow	All P's conduct, delayed
Mobitz I (Wenckebach)	40–60	Irregular	More P than QRS	Lengthens → drop	Narrow	Longer...longer...drop
Mobitz II	<60	Reg P / irreg QRS	More P than QRS	Constant → drop	Often wide	Sudden dropped QRS
3rd-Degree (CHB)	20–60	Dissociated	Independent	Varies (none)	Narrow or wide	Complete AV dissociation
Junctional (escape)	40–60	Regular	Absent/inverted	Short or none	Narrow	No upright P
Accelerated Junctional	60–100	Regular	Absent/inverted	Short or none	Narrow	Junctional, normal rate
Idioventricular	20–40	Regular	Absent	None	Wide	Slow wide escape
AIVR	40–100	Regular	Absent/dissoc	None	Wide	Reperfusion, <100
Ventricular Escape	<40	Reg/irreg	Absent	None	Wide	Last-resort pacemaker

RHYTHM-BY-RHYTHM

01 SINUS BRADYCARDIA

< 60 bpm



EKG STRIP FINDINGS

RATE	< 60 bpm
RHYTHM	Regular
P WAVE	Normal, upright, 1 before every QRS
PR	Normal 0.12–0.20s
QRS	Narrow < 0.12s
HALLMARK	Normal complexes, just slow

PATHOPHYSIOLOGY

SA node fires too slowly. Causes: athletic conditioning, sleep, ↑ vagal tone, inferior-wall MI, ↑ ICP, hypothyroidism, hypothermia, AV-nodal drugs (beta-blockers, CCBs, digoxin).

TREATMENT

- ▶ Often **no treatment** if asymptomatic (normal in athletes/sleep).
- ▶ Identify & treat the cause; hold offending AV-nodal drugs.
- ▶ If symptomatic → **Atropine** 1 mg IV, repeat q3–5 min (max 3 mg).
- ▶ Refractory → transcutaneous pacing, dopamine or epinephrine infusion.

STABLE – PRIORITY

Asymptomatic & perfusing → monitor, recheck cause, document. No drug needed.

UNSTABLE – PRIORITY

Hypotension, ↓LOC, chest pain, shock
→ **Atropine first**, then pacing / pressor.

02 FIRST-DEGREE AV BLOCK

usually 60–100



EKG STRIP FINDINGS

RATE	Underlying rate (often normal)
RHYTHM	Regular
P WAVE	Normal, 1 before every QRS
PR	Prolonged > 0.20s & constant
QRS	Narrow
HALLMARK	Every P conducts, just delayed

PATHOPHYSIOLOGY

Conduction delayed through the AV node but **every** impulse still reaches the ventricles. Often benign; from ↑ vagal tone, AV-nodal drugs, ischemia, aging conduction system.

TREATMENT

- ▶ Typically **no treatment** — benign, observe.
- ▶ Review/hold AV-nodal blocking drugs if PR is lengthening.
- ▶ Monitor for progression to higher-degree block.

STABLE – PRIORITY

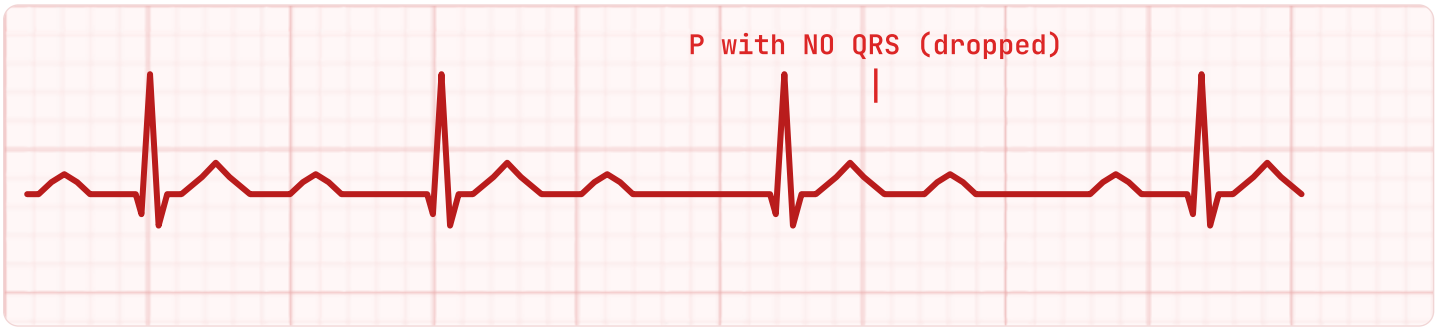
Almost always stable — monitor on telemetry, trend the PR interval.

UNSTABLE – PRIORITY

Rare. If bradycardic & symptomatic, treat the underlying slow rate (atropine).

03 2ND-DEGREE AV BLOCK, TYPE I (MOBITZ I / WENCKEBACH)

40-60



EKG STRIP FINDINGS

RATE	Atrial > ventricular
RHYTHM	Irregular (grouped beats)
P WAVE	Normal; more P's than QRS
PR	Progressively lengthens until a QRS drops
QRS	Usually narrow
HALLMARK	"Longer, longer, longer... drop"

PATHOPHYSIOLOGY

Progressive AV-nodal fatigue until one atrial impulse is fully blocked (dropped QRS), then the cycle resets. Usually a **nodal**, often transient/benign block (inferior MI, AV-nodal drugs, ↑ vagal tone).

TREATMENT

- Usually **no treatment** if asymptomatic — often transient.
- Hold AV-nodal drugs; treat reversible causes.
- If symptomatic bradycardia → **Atropine**, then transcutaneous pacing.

STABLE — PRIORITY

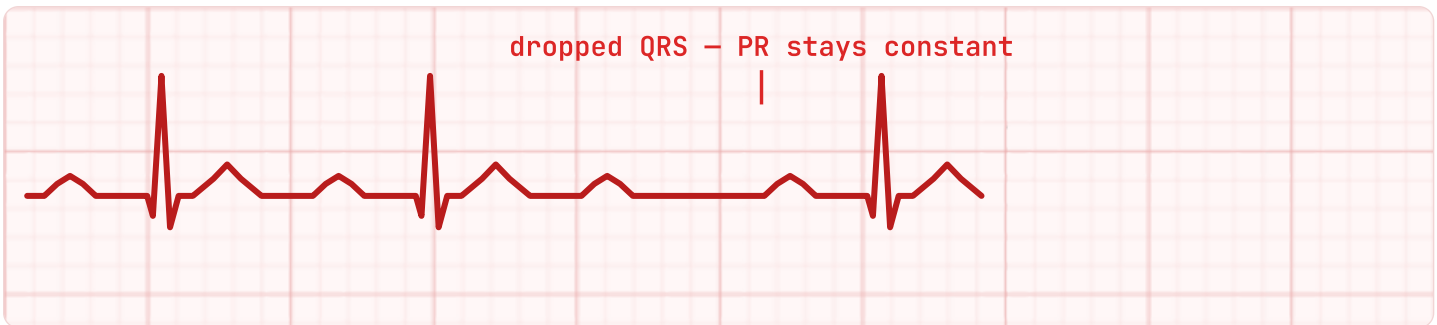
Asymptomatic → monitor; generally benign & self-limiting.

UNSTABLE — PRIORITY

Symptomatic → Atropine usually works (nodal); pacing if refractory.

04 2ND-DEGREE AV BLOCK, TYPE II (MOBITZ II)

often < 60



EKG STRIP FINDINGS

RATE	Atrial > ventricular
RHYTHM	Regular P's, irregular QRS
P WAVE	More P's than QRS; some not conducted
PR	Constant on conducted beats (no lengthening)
QRS	Often wide (infranodal)
HALLMARK	Sudden dropped QRS, PR unchanged

PATHOPHYSIOLOGY

Block is **below** the AV node (His–Purkinje). Impulses fail intermittently without warning. **Dangerous** — unstable and can progress abruptly to complete heart block.

TREATMENT

- **Prepare for pacing** — transcutaneous now, transvenous → permanent pacemaker.
- **Atropine is often ineffective** (infranodal) & may worsen the ratio — do not rely on it.
- Hold AV-nodal drugs; have pacer pads on the patient.
- Bridge with dopamine/epinephrine while arranging pacing.

STABLE — PRIORITY

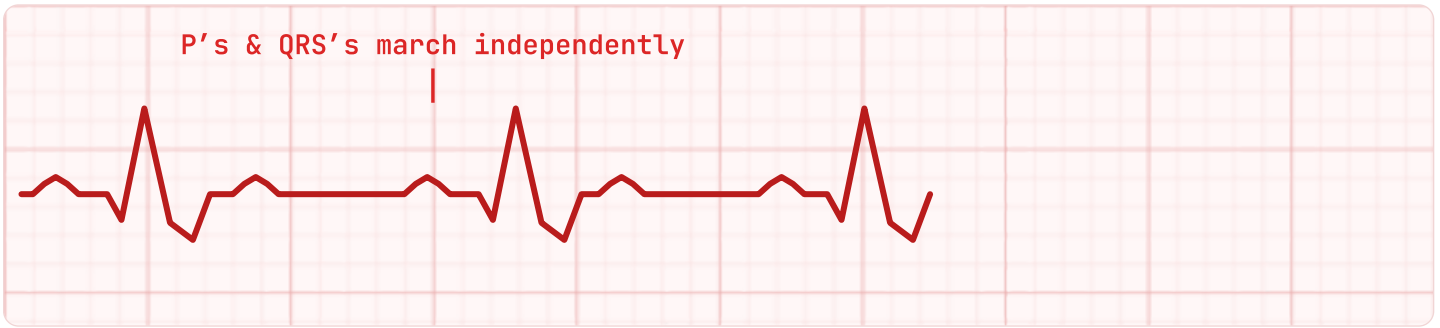
Even if "stable," treat as **high-risk**: continuous monitor, pads on, pacing ready.

UNSTABLE — PRIORITY

Transcutaneous pacing → permanent pacemaker. Atropine generally won't fix it.

05 3RD-DEGREE AV BLOCK (COMPLETE HEART BLOCK)

vent. 20-40 (or 40-60)



EKG STRIP FINDINGS

RATE	Atrial > ventricular (independent)
RHYTHM	Both regular, dissociated
P WAVE	Regular, march through QRS
PR	Varies — no relationship to QRS
QRS	Narrow (junctional escape) or wide (ventricular escape)
HALLMARK	Complete AV dissociation

PATHOPHYSIOLOGY

No atrial impulses reach the ventricles. A junctional (40-60) or ventricular (20-40) escape pacemaker takes over independently. **Medical emergency** — high risk of asystole.

TREATMENT

- ▶ **Transcutaneous pacing immediately** if unstable → transvenous → permanent pacemaker.
- ▶ **Atropine usually ineffective**, especially with wide-QRS escape.
- ▶ Dopamine or epinephrine infusion as a bridge to pacing.
- ▶ Hold AV-nodal drugs; treat reversible causes (MI, hyperkalemia, digoxin toxicity).

STABLE — PRIORITY

Rarely truly stable — pacer pads on, IV access, continuous monitoring, urgent cardiology.

UNSTABLE — PRIORITY

Emergent pacing (transcutaneous → transvenous). Pressor bridge; do not wait on atropine.

06 JUNCTIONAL RHYTHM (ESCAPE)

40-60



EKG STRIP FINDINGS

RATE	40-60 bpm
RHYTHM	Regular
P WAVE	Absent, inverted , or retrograde (before/in/after QRS)
PR	Short (< 0.12s) if P precedes QRS
QRS	Narrow
HALLMARK	No upright sinus P; AV junction pacing

PATHOPHYSIOLOGY

SA node fails or slows, so the AV junction escapes as backup pacemaker (intrinsic 40-60). Common causes: **digoxin toxicity**, ↑ vagal tone, inferior MI, SA-node disease.

TREATMENT

- ▶ Treat the cause — **check a digoxin level**; hold digoxin if toxic.
- ▶ If rate adequate & asymptomatic → monitor, no drug.
- ▶ If symptomatic bradycardia → Atropine, then pacing.

STABLE — PRIORITY

Adequate perfusion → monitor, correct cause (drugs/electrolytes).

UNSTABLE — PRIORITY

Symptomatic slow rate → Atropine → transcutaneous pacing.

07 ACCELERATED JUNCTIONAL RHYTHM

60–100

junctional morphology, rate 60–100



EKG STRIP FINDINGS

RATE	60–100 bpm (faster than escape)
RHYTHM	Regular
P WAVE	Absent, inverted, or retrograde
PR	Short if present
QRS	Narrow
HALLMARK	Junctional morphology at a “normal” rate

TREATMENT

- ▶ Identify & treat cause — **suspect & check digoxin toxicity**.
- ▶ Usually hemodynamically tolerated (rate is adequate) → often no acute drug.
- ▶ Correct electrolytes; hold digoxin if toxic.

STABLE — PRIORITY

Usually stable — rate is adequate; monitor & treat the cause.

UNSTABLE — PRIORITY

Uncommon. If loss of AV synchrony → symptomatic, treat cause & support perfusion.

PATHOPHYSIOLOGY

An enhanced/irritable AV junction overrides the SA node at 60–100. Classic red-flag cause: **digoxin toxicity**; also ischemia, myocarditis, post-cardiac surgery.

08 IDIOVENTRICULAR RHYTHM

20–40

wide bizarre QRS • no P • 20–40



EKG STRIP FINDINGS

RATE	20–40 bpm
RHYTHM	Regular
P WAVE	Absent (or dissociated)
PR	None
QRS	Wide & bizarre > 0.12s
HALLMARK	Slow wide-complex ventricular escape

TREATMENT

- ▶ **Never suppress** — do NOT give lidocaine/amiodarone (it’s the only rhythm).
- ▶ Treat as symptomatic bradycardia: pacing; epinephrine/dopamine infusion.
- ▶ Atropine often ineffective (wide-complex) — move toward pacing.
- ▶ Find & correct cause (MI, hyperkalemia, hypoxia, drug toxicity).

STABLE — PRIORITY

Rarely stable. Monitor closely, pacer pads on, IV access, prepare to pace.

UNSTABLE — PRIORITY

Pacing & pressor support. **Do not give antiarrhythmics** that suppress it.

PATHOPHYSIOLOGY

Both SA node and AV junction fail; a **ventricular** escape focus paces at 20–40. It is a **protective backup** — the heart’s last line before asystole.

09 ACCELERATED IDIOVENTRICULAR RHYTHM (AIVR)

40-100

wide QRS • rate 40-100 (reperfusion)



EKG STRIP FINDINGS

RATE	40-100 bpm
RHYTHM	Regular
P WAVE	Absent or AV dissociation
PR	None
QRS	Wide > 0.12s
HALLMARK	Wide-complex, < 100 (not VT); reperfusion rhythm

PATHOPHYSIOLOGY

A ventricular focus fires faster than its escape rate but < 100 (so it is **not VT**). Classic **reperfusion arrhythmia** after thrombolytics/PCI — usually benign & transient.

TREATMENT

- Usually **no treatment** — benign, self-limiting, well tolerated.
- Do not suppress** — avoid antiarrhythmics; observe (often a good sign post-reperfusion).
- If loss of AV kick → symptomatic, Atropine to speed the sinus rate & overdrive it.

STABLE — PRIORITY

Usually stable — monitor; common & expected after reperfusion.

UNSTABLE — PRIORITY

Rare. Atropine to restore sinus dominance; avoid suppressive antiarrhythmics.

10 VENTRICULAR ESCAPE RHYTHM

< 40

last-resort pacemaker • wide • <40



EKG STRIP FINDINGS

RATE	20-40 bpm (often < 40)
RHYTHM	Regular / may be irregular
P WAVE	Absent or dissociated
PR	None
QRS	Wide & bizarre
HALLMARK	Heart's last-resort pacemaker

PATHOPHYSIOLOGY

When SA node and all higher pacemakers fail, a ventricular focus escapes at < 40 to sustain any output. Functionally the same family as idioventricular rhythm — an **emergency**, frequently seen with complete heart block.

TREATMENT

- Never suppress** — it may be the only thing keeping a pulse.
- Transcutaneous pacing** emergently → transvenous / permanent.
- Epinephrine or dopamine infusion as a bridge; atropine often ineffective.
- Correct reversible causes urgently (hyperkalemia, hypoxia, MI, toxins).

STABLE — PRIORITY

Essentially never “stable” — treat as a peri-arrest emergency, pads on.

UNSTABLE — PRIORITY

Emergent pacing + pressor support. Do not give suppressive antiarrhythmics.

↑ SYMPTOMATIC BRADYCARDIA PRIORITY LADDER (ACLS)

1 Assess & identify INSTABILITY
Check ABCs, vitals, LOC, perfusion. Unstable = hypotension, acute ↓LOC, shock, ischemic chest pain, or acute heart failure.

2 Atropine 1 mg IV
First-line for symptomatic bradycardia. Repeat q3–5 min,
max 3 mg

Less effective
in Mobitz II, CHB, & wide-complex escape.

3 Transcutaneous Pacing (TCP)
If atropine fails or is inappropriate (Mobitz II / 3rd-degree / wide-complex). Sedate & confirm electrical +
mechanical
capture (palpate pulse).

4 Dopamine 5–20 mcg/kg/min OR Epinephrine 2–10 mcg/min
Infusion while awaiting pacing or if pacing fails. Titrate to perfusion/MAP.

5 Expert consult & transvenous / permanent pacemaker
Definitive therapy for high-grade blocks (Mobitz II, 3rd-degree). Treat reversible causes throughout (H's & T's).

PACING-FIRST RHYTHMS: Mobitz II, 3rd-degree (complete) heart block, and any wide-complex ventricular escape do **NOT** reliably respond to atropine — go straight to transcutaneous pacing and prepare for a transvenous/permanent pacemaker. **NEVER SUPPRESS** idioventricular, AIVR, or ventricular escape rhythms with antiarrhythmics.

⚡ KEY MEDICATIONS

ATROPINE

1 mg IV q3–5 min • max 3 mg

First-line for symptomatic bradycardia. Anticholinergic → ↑ SA/AV firing. **Less effective** in Mobitz II, 3rd-degree block, and wide-complex escape.

EPINEPHRINE

2–10 mcg/min IV infusion

Beta-1 chronotropy when atropine fails or pacing is delayed. Titrate to HR & perfusion.

DOPAMINE

5–20 mcg/kg/min IV infusion

Inotrope/chronotrope bridge to pacing. Titrate to MAP/perfusion; central line preferred.

HOLD THE “SLOW-ERS”

beta-blockers • CCBs • digoxin

Common reversible causes — review & **hold AV-nodal blockers**; check a digoxin level (junctional rhythms & dig toxicity travel together).

✉ PATIENT EDUCATION

TEACHING CHECKLIST

- ✓ Take your radial pulse for a full minute; report a rate under your provider's set threshold.
- ✓ Take beta-blockers / CCBs / digoxin exactly as prescribed — never double or skip doses.
- ✓ **Pacemaker care:** keep cell phones on the opposite ear; avoid strong magnetic fields/MRI unless cleared.
- ✓ Avoid heavy lifting / raising the arm above shoulder on the pacemaker side until cleared.
- ✓ Report dizziness, fainting, fatigue, chest pain, or shortness of breath promptly.
- ✓ Know early digoxin-toxicity signs: nausea, vision changes (halos/yellow), confusion.
- ✓ Carry your pacemaker ID card; report hiccups, twitching, or pulse below the set rate.
- ✓ Call 911 for fainting, prolonged dizziness, or a pulse that does not recover.

SAVE & PRINT THIS GUIDE

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