NGN NCLEX 2026 · CARDIOVASCULAR · ACLS

Lethal *Cardiac* Rhythms

The four arrest rhythms every nurse must recognize in seconds: Ventricular Tachycardia, Ventricular Fibrillation, Pulseless Electrical Activity, and Asystole.

FOCUS	FRAMEWORK	PRIORITY	TIME TO ACT
Code Blue · ACLS	NCJMM · CAB	CPR → Rhythm Check	< 10 seconds

01 Overview

DEFINITION · WHY IT MATTERS

The **lethal rhythms** are four dysrhythmias associated with cardiac arrest. Without immediate intervention — high-quality CPR, defibrillation (when indicated), and ACLS medications — these rhythms result in death within minutes.

> *Two are shockable. Two are not. Mixing them up is how patients die.*

On the NCLEX, the nurse must instantly classify the rhythm, initiate the correct intervention *first*, and identify reversible causes using the **H's and T's**.

4	2	2 min	10H+T
LETHAL RHYTHMS	SHOCKABLE (VF / PVT)	RHYTHM / PULSE CHECK	REVERSIBLE CAUSES

02 Pathophysiology — Simplified

ELECTRICAL → MECHANICAL FAILURE

1. **Ischemia / Insult** — MI, hypoxia, electrolyte imbalance, or toxin disrupts the heart's electrical system.
2. **Irritable Focus** — Ventricular cells fire outside normal pathway → wide, bizarre QRS.
3. **Loss of Coordination** — Chaotic quivering replaces organized contraction (VF), or ventricles depolarize with no pump (PEA).
4. **No Cardiac Output** — No perfusion → no pulse → no oxygen to brain or tissues.
5. **Cellular Death** — Brain injury begins in 4–6 min. Irreversible damage without rapid intervention.

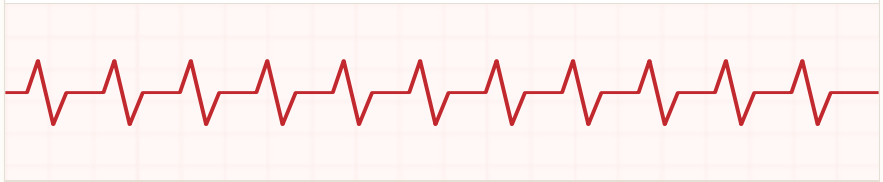
03 The Four Lethal Rhythms

RECOGNIZE AT A GLANCE

Ventricular Tachycardia

V-TACH · VT

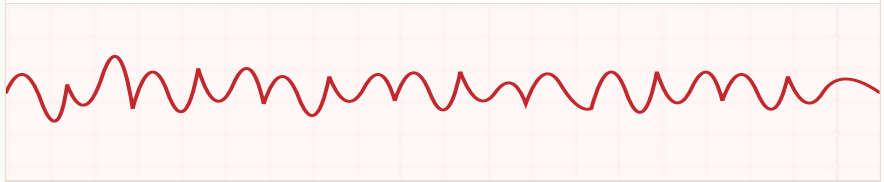
⚡ SHOCKABLE*



Ventricular Fibrillation

V-FIB · VF

⚡ SHOCKABLE



RATE	100–250 bpm, **regular**
QRS	**Wide & bizarre** (>0.12 sec), no P waves
PULSE?	May or may not have one — **assess immediately**
S/S	Palpitations, CP, dyspnea, hypotension, syncope, loss of consciousness

PRIORITY ACTION

Pulseless VT → CPR + DEFIBRILLATE (unsynchronized)
Unstable + pulse → Synchronized cardioversion
Stable + pulse → Amiodarone, lidocaine, procainamide

RATE	**Unable to measure** — chaotic
QRS	None — **no discernible waveforms** (coarse or fine squiggles)
PULSE?	**ALWAYS pulseless** — ventricles quiver, no pumping
S/S	Sudden collapse, unresponsive, no pulse, no breathing, no BP

PRIORITY ACTION

CPR → DEFIBRILLATE ASAP (unsynchronized, 120–200 J biphasic)
Resume CPR × 2 min → check rhythm
Epinephrine 1 mg IV q3–5 min · Amiodarone 300 mg after 2nd shock

Pulseless Electrical Activity

PEA

✕ NOT SHOCKABLE

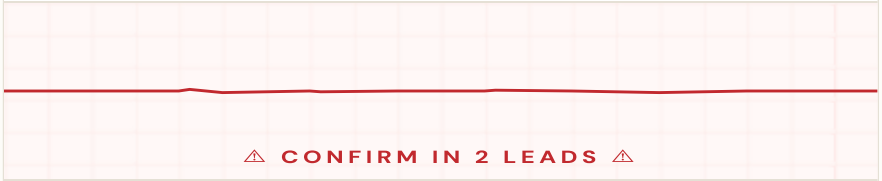
RATE	**Any** — can look normal
QRS	**Organized electrical activity** on monitor (often narrow/sinus-like)
PULSE?	**NO PULSE** despite monitor showing rhythm — classic PEA paradox
S/S	Unresponsive, pulseless, apneic — monitor fools the eye

PRIORITY ACTION

Asystole

FLATLINE

✕ NOT SHOCKABLE



RATE	**0** — no electrical activity
QRS	**Flat line** (may have occasional P wave drift)
PULSE?	**No pulse, no heart sounds** — terminal rhythm
FIRST STEP	**Confirm in 2 leads** — rule out disconnected lead/artifact

PRIORITY ACTION

CPR + Epinephrine 1 mg IV q3–5 min
DO NOT DEFIBRILLATE — treat the cause!
Search H's & T's → reverse the underlying problem

CPR + Epinephrine 1 mg IV q3–5 min
NEVER SHOCK ASYSTOLE — no electricity to reset!
Search H's & T's · poor prognosis · consider termination

04 Shockable vs. Non-Shockable

THE MOST TESTED DISTINCTION

Shockable Rhythms

DEFIBRILLATION INDICATED

- **Ventricular Fibrillation (VF)** — chaotic, pulseless, always shock
- **Pulseless Ventricular Tachycardia (pVT)** — wide regular, no pulse
- Defibrillation = **UNSYNCHRONIZED** shock
- Biphasic: 120–200 J · Monophasic: 360 J
- Resume CPR immediately after shock — do not stop to check pulse
- Pulse/rhythm check every **2 minutes**

Non-Shockable Rhythms

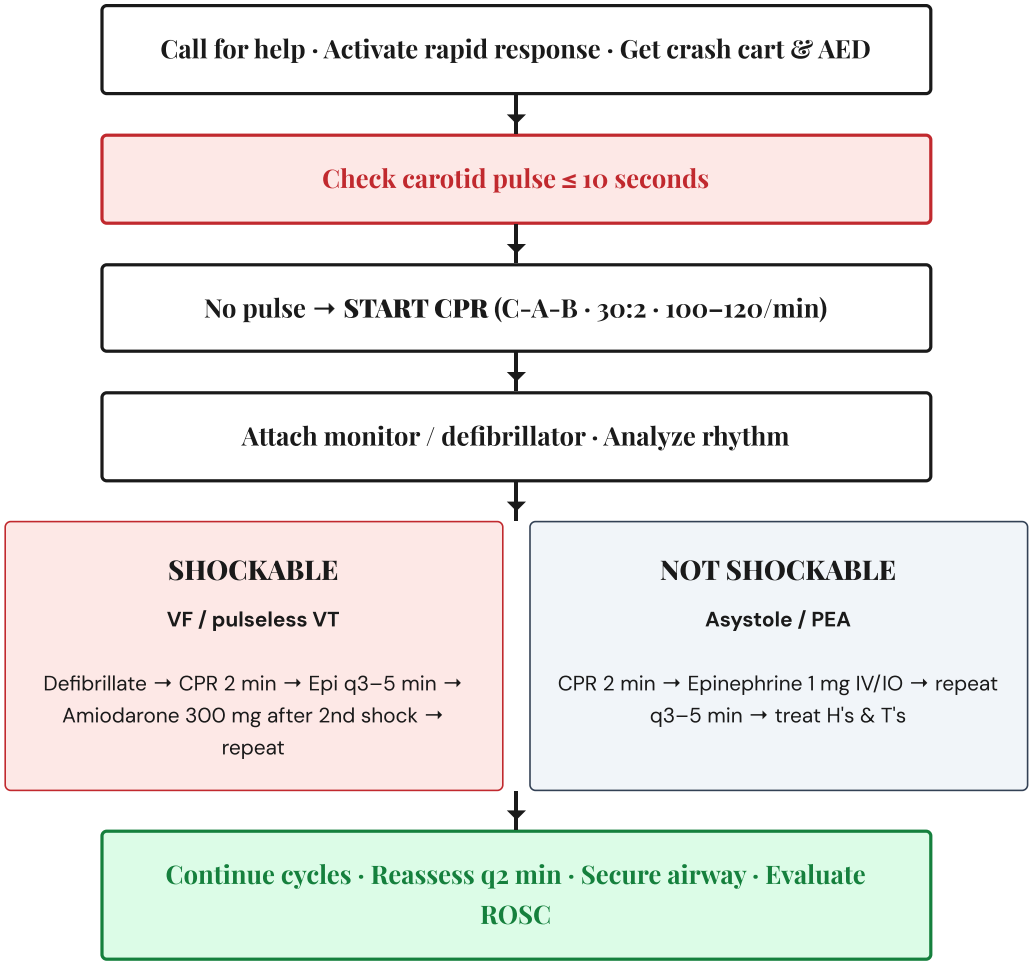
CPR + EPI + FIND THE CAUSE

- **Asystole** — flat line, no electrical activity
- **PEA** — organized rhythm, no pulse
- No shock — there's nothing for electricity to reset
- Focus: high-quality CPR + **Epinephrine 1 mg q3–5 min**
- Actively search for reversible causes (**H's & T's**)
- Confirm asystole in two leads before calling it

05 Priority Nursing Algorithm

FIRST FIVE MINUTES OF A CODE

Unresponsive · Not Breathing Normally



06 ACLS Pharmacology

CODE DRUGS · DOSES · NURSING PEARLS

Epinephrine

CATECHOLAMINE · ALPHA + BETA AGONIST

USE **All four lethal rhythms** — VF, pVT, PEA, asystole

Amiodarone

CLASS III ANTIDYSRHYTHMIC

USE **VF & pulseless VT** refractory to defibrillation

DOSE	1 mg IV/IO push, **repeat every 3–5 minutes**
MECHANISM	Vasoconstriction → ↑ coronary & cerebral perfusion during CPR
WATCH	Tachycardia, hypertension, ischemia post-ROSC; flush line after push

DOSE	300 mg IV/IO bolus after 2nd–3rd shock; 2nd dose 150 mg
MECHANISM	Prolongs repolarization, stabilizes membrane, slows conduction
WATCH	Hypotension, bradycardia, QT prolongation, pulmonary toxicity (long-term)

Lidocaine

CLASS IB ANTIDYSRHYTHMIC

USE	Alternative to amiodarone for VF/pVT
DOSE	1–1.5 mg/kg IV/IO; may repeat 0.5–0.75 mg/kg q5–10 min (max 3 mg/kg)
MECHANISM	Suppresses ventricular ectopy by blocking sodium channels
WATCH	CNS toxicity — confusion, slurred speech, seizures; reduce dose in liver failure

Magnesium Sulfate

ELECTROLYTE · ANTIDYSRHYTHMIC

USE	**Torsades de Pointes** (polymorphic VT) · hypomagnesemia-related VF
DOSE	1–2 g IV/IO diluted in D5W over 5–20 min
MECHANISM	Stabilizes cardiac membrane, shortens QT interval
WATCH	Hypotension, respiratory depression, **loss of deep tendon reflexes** (early toxicity sign)

07 Reversible Causes — H's & T's

ESSENTIAL FOR PEA & ASYSTOLE

The H's

5 METABOLIC / PHYSIOLOGIC CAUSES

1. **Hypovolemia** — trauma, GI bleed · Tx: IV fluids, blood
2. **Hypoxia** — airway obstruction, pulmonary disease · Tx: oxygenate, secure airway
3. **Hydrogen Ion (Acidosis)** — DKA, renal failure · Tx: ventilate, consider bicarb
4. **Hypo-/Hyperkalemia** — check labs · Tx: K correction, calcium, insulin/glucose

The T's

5 MECHANICAL / TOXIC CAUSES

1. **Tension Pneumothorax** · Tx: immediate needle decompression
2. **Tamponade (Cardiac)** — Beck's triad · Tx: pericardiocentesis
3. **Toxins** — drug overdose (opioids, TCA, beta-blocker) · Tx: antidote
4. **Thrombosis — Pulmonary** (massive PE) · Tx: thrombolytics
5. **Thrombosis — Coronary** (MI) · Tx: PCI post-ROSC

5 **Hypothermia** — exposure, drowning · Tx: warm the patient

08 NCLEX Test Traps

WHERE STUDENTS LOSE POINTS

⚠ TRAP #1 · SHOCKING ASYSTOLE

"Shock the flatline"

Hollywood loves it. NCLEX hates it. Asystole has **no electrical activity** — defibrillation does nothing because there's nothing to reset.

Correct: CPR + Epinephrine + find the reversible cause. Confirm asystole in 2 leads first.

⚠ TRAP #2 · CONFUSING VT AND VF TREATMENT

"Cardiovert pulseless VT"

Synchronized cardioversion requires a pulse (and an R wave to sync to). Pulseless VT gets **defibrillation** — just like VF.

Rule: No pulse = defibrillate · Unstable with pulse = synchronized cardiovert · Stable = antidysrhythmic.

⚠ TRAP #3 · SEEING PEA AS "NORMAL"

"Monitor looks fine — must be okay"

PEA shows organized electrical activity that can look like a normal rhythm, but there is **no mechanical pulse**. Always assess the patient — not just the screen.

Rule: Treat the patient, not the monitor. Always check for a pulse in an unresponsive patient.

⚠ TRAP #4 · PULSE CHECK BEFORE CPR

"Call the code first"

After confirming unresponsive and not breathing, **CPR comes before anything else** — including waiting on the AED or calling the provider.

Order: Check responsiveness → Call for help → Check pulse (≤10 sec) → **START CPR** → attach monitor.

⚠ TRAP #5 · SPEEDING UP EPINEPHRINE

"Give it every 5 min no matter what"

Epinephrine is dosed at **1 mg IV q3–5 min**. Giving it more often can cause severe post-ROSC hypertension and myocardial oxygen demand.

Rule: 1 mg / 3–5 min window · flush IV line after each dose · never mix with sodium bicarbonate.

⚠ TRAP #6 · STOPPING CPR TO CHECK PULSE

"Check pulse after every shock"

After a shock, resume CPR **immediately**. Pulse and rhythm checks happen only **every 2 minutes** between CPR cycles.

Rule: Minimize interruptions — chest compressions sustain perfusion.

09 Patient & Family Education

PREVENTION · POST-ROSC · SURVIVORS

Prevention & Risk Reduction

- Take cardiac medications as prescribed — don't skip beta-blockers or antidysrhythmics
- Report chest pain, palpitations, syncope, or "skipped beats" immediately
- Monitor and correct electrolytes (especially K+ and Mg++) in patients on diuretics or digoxin
- Avoid stimulants, illicit drugs, excessive caffeine
- Know your family history of sudden cardiac death

Post-ROSC & ICD Care

- After an ICD, no MRI without clearance; avoid strong magnetic fields
- Keep cell phones on the opposite side of the ICD
- Report device shocks — note time, activity, and frequency
- Targeted temperature management (TTM) may be used post-arrest to protect the brain
- Cardiac rehab after discharge improves survival

Family CPR & AED

- Encourage household CPR and AED training — bystander CPR doubles survival
- Teach family to call 911 **first**, then start compressions
- Emphasize: public AEDs will not shock a rhythm that doesn't need it
- Provide emotional support — witnessed cardiac arrest is traumatic
- Discuss advance directives and code status before a crisis

10 NCJMM Clinical Judgment

RECOGNIZE → ANALYZE → PRIORITIZE → TAKE ACTION → EVALUATE

> *Scenario — A 68-year-old post-MI client on the telemetry unit suddenly becomes unresponsive. The monitor shows a wide, regular QRS complex at 180 bpm. The nurse palpates no carotid pulse. Another nurse pulls the crash cart.*

01	02	03	04	05	06
Recognize Cues	**Analyze Cues**	**Prioritize Hypothesis**	**Generate Solutions**	**Take Action**	**Evaluate Outcomes**
Unresponsive, pulseless, monitor	Rhythm = pulseless VT. This is a **shockable**		Start CPR, defibrillate, epi q3–5 min,	Begin chest compressions 100–	Reassess rhythm/pulse q2 min.

shows wide-complex tachycardia at 180.	**arrest rhythm**.	Perfusion is zero. Brain death imminent without immediate compressions and defibrillation.	amiodarone after 2nd shock, airway, IV access.	120/min. Apply defibrillator pads. Deliver unsynchronized shock. Resume CPR 2 min. Push epinephrine 1 mg IV.	ROSC = return of spontaneous circulation. If achieved → post-cardiac-arrest care, TTM, ICU transfer.

11 Memory Boosters

MNEMONICS · PATTERN RECOGNITION

V-F-PA

The 4 Lethal Rhythms

- **V** entricular Tachycardia
- **F** ibrillation (Ventricular)
- **P** ulseless Electrical Activity
- **A** systole

"Shock VF/VT"

Shockable Only

- `VF` → always shockable
- `VT` (pulseless) → shockable
- Memory: `"V"` for Voltage
- `PEA + Asystole` = never shocked

C-A-B

CPR Sequence (Adult Arrest)

- **C** ompressions first — 100–120/min
- **A** irway — open & secure
- **B** reathing — 30:2 or 1 every 6 sec w/ advanced airway

5 H's

Reversible Causes Pt. 1

- **H** ypovolemia
- **H** ypoxia
- **H** ydrogen ion (acidosis)
- **H** ypo/Hyperkalemia
- **H** ypothermia

5 T's

Reversible Causes Pt. 2

- **T** ension pneumothorax
- **T** amponade (cardiac)
- **T** oxins
- **T** hrombosis — pulmonary
- **T** hrombosis — coronary (MI)

"Can't Shock"

PEA & Asystole

- **P** EA = pulseless — but electrical signal present
- **A** systole = absent — flatline
- Both: `CPR + Epi + H's & T's`
- Never: defib, cardioversion, pacing (asystole)