ER BASICS · ONE-PAGER

Rhythm Gallery

21 drawn strips: how to name each rhythm and the first move exams expect

12 sources + more detail
erbasics.com/sheets/rhythm-gallery.html
checked Oct 2026

1 Sinus, atrial and junctional

Read in order: rate, regularity, P waves, PR, QRS. Normal PR 0.12–0.20 s; narrow QRS under 0.12 s. Doses are typical adult exam values; follow your institution's protocols.



Normal sinus rhythm: 60–100/min, regular, a P before every narrow QRS.



Sinus bradycardia: under 60/min (here about 42). Symptomatic: atropine 1 mg IV every 3–5 min, max 3 mg.



Sinus tachycardia: over 100/min (here about 128). Treat the cause: pain, fever, hypovolemia, hypoxia.



Atrial fibrillation: irregularly irregular, no P waves, wavy baseline. Stable: IV beta-blocker, or diltiazem only if EF is over 40%. Unstable: synchronized cardioversion.



Atrial flutter: sawtooth waves near 300/min (here 4:1, about 75); at 2:1 (about 150) it mimics SVT. Managed like AF.



SVT: regular, narrow, fast (here about 180), P waves hidden. Stable: vagal maneuver, then adenosine 6 mg rapid push and flush, then 12 mg. Unstable: synchronized cardioversion.



Junctional: regular, narrow, about 40–60/min; P waves absent, inverted or after the QRS. Symptomatic: treat as bradycardia; think of digoxin.

SAFETY AF 48 h or more: 3 weeks of anticoagulation, or imaging to rule out clot, before elective cardioversion; 4 weeks after. Never delay an unstable patient.

SAFETY AF with WPW (fast, irregular, wide): no AV-nodal blockers (adenosine, diltiazem, beta-blockers, digoxin, amiodarone). Unstable: cardiovert. Stable: procainamide or ibutilide.

2 AV blocks



First-degree: PR over 0.20 s, constant; every P conducts. Usually monitor; review AV-nodal drugs.



Type I (Wenckebach): PR lengthens until one P does not conduct, then resets. Usually at the AV node; atropine if symptomatic.



Type II: PR constant, then a P suddenly fails to conduct. Block is below the AV node, so the QRS is often wide (drawn narrow here). Pads on, ready to pace.



Complete block: P waves and QRS run independently; the atrial rate (here about 88) is faster than the wide escape (about 36). Pace if unstable: transcutaneous, then transvenous.

EXAM TIP Mobitz I vs II: the PR lengthens then resets in type I; it stays constant in type II, which exams pace. A 2:1 block cannot be typed from one strip.

SAFETY In type II and complete block, atropine often fails; do not let it delay pacing. Dopamine 5–20 mcg/kg/min or epinephrine 2–10 mcg/min can bridge.

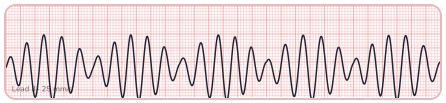
3 Ventricular



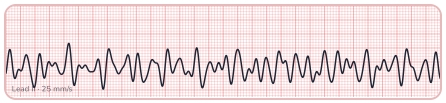
PVC bigeminy: every other beat early and wide, T wave opposite. Causes: low K or Mg, ischemia, hypoxia, stimulants.



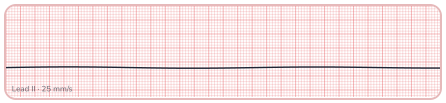
Monomorphic VT: wide, regular, identical complexes over 100/min (here about 165). Treatment depends on the pulse check below.



Torsades: polymorphic VT twisting around the baseline, usually with a long QT. Pulseless: defibrillate. With a pulse: magnesium 1–2 g IV over about 15 min; avoid QT-prolonging drugs such as amiodarone.



VF: chaotic baseline, no QRS, no pulse. CPR and immediate shock; epinephrine 1 mg after shock 2, then every 3–5 min; amiodarone 300 mg (then 150 mg) or lidocaine after shock 3.



Asystole: flat line; confirm in a second lead. CPR and epinephrine 1 mg as soon as possible; never shock. PEA (organized rhythm, no pulse): same path; find the cause.

EXAM TIP Exams test the VT pulse check: no pulse, defibrillate; a pulse but unstable, synchronized cardioversion; stable, antiarrhythmic and expert help.

SAFETY Polymorphic VT and VF need unsynchronized shocks; sync mode may not fire. For synchronized cardioversion, sedate if possible and confirm sync before each shock.

4 Pacing



Ventricular pacing: a spike before every wide QRS at the set rate (here 70). Confirm a matching pulse.



Failure to capture: a spike with no QRS. Check connections and lead position, then raise the output (mA); temporary wires usually run at about twice the capture threshold.



Failure to sense: spikes ignore the patient's own beats and can land on T waves. Lower the sensitivity number (mV) so it senses more.

SAFETY R-on-T pacing can trigger VF. Transcutaneous pacing hurts: give analgesia and sedation, and check a femoral pulse, as muscle twitch mimics a carotid pulse.

5 ST and T changes



Hyperkalemia: peaked T, flat P, widening QRS, then a sine wave. With ECG changes, IV calcium first; then shift K (insulin with glucose, albuterol), then remove it.



STEMI: new ST elevation in 2 or more contiguous leads (1 mm or more; higher in V2–V3). 12-lead within 10 min of first contact; door-to-PCI goal 90 min or less.

EXAM TIP Calcium protects the heart but does not lower K. Up to half of patients with a high K have a normal ECG.

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