ACS and STEMI

Territories, time goals, first drugs and complications

ACS SPECTRUM AND STEMI CRITERIA

TYPE	TROPONIN	ECG
Unstable angina	Not elevated	Normal or ST-T changes
NSTEMI	Rise/fall above 99th percentile	No ST elevation
STEMI	Rises; never wait for it	New ST elevation

- ST elevation ≥1 mm in 2 contiguous leads; V2-V3: ≥2 mm men 40+, ≥2.5 mm men under 40, ≥1.5 mm women
- ST depression in V1-V3: get V7-V9; ≥0.5 mm elevation = posterior STEMI
- Inferior STEMI: get V4R; ≥0.5 mm elevation = RV involvement

PATTERN	MEANING
LBBB or paced with concordant ST changes (Sgarbossa)	STEMI equivalent; new LBBB alone is not
de Winter T waves	Proximal LAD occlusion: cath lab now
Wellens T waves V2-V3, pain-free	Critical LAD; cath, no stress test
aVR elevation, diffuse ST depression	Left main or 3-vessel; no lytic

12-LEAD TERRITORIES

WALL	LEADS	ARTERY	WATCH FOR
Septal/anterior	V1-V4	LAD	Pump failure, VSD, LV thrombus
Lateral	I, aVL, V5-V6	LCx or diagonal	Often with other walls
Inferior	II, III, aVF	RCA (80%) or LCx	Bradycardia, AV block, RV MI
Right ventricle	V4R; clues V1 elevation, III > II	Proximal RCA	Hypotension: IV fluid, no nitrates
Posterior	V7-V9	LCx or RCA	Missed without posterior leads



Confirm monitor ST elevation on a 12-lead.

Inferior MI block: nodal, transient, narrow escape; atropine may help. Anterior MI block: infranodal, wide unstable escape; prepare to pace. New BBB alone: pads on, watch.

TIME GOALS (ACC/AHA)

STEP	GOAL
12-lead read	≤10 min from first contact; repeat if nondiagnostic
Primary PCI	First contact (door, if walk-in) to device ≤90 min
Transfer for PCI	First contact to device ≤120 min
PCI over 120 min away, symptoms under 12 h	Fibrinolytic within 30 min of arrival
After fibrinolytic	Transfer now; angiography at 2-24 h
NSTE-ACS	Unstable: immediate cath; high risk: ≤24 h

EXAM TIP Remember 10, 90, 120, 30. EMS: transmit the 12-lead, notify early, bypass to a PCI center.

INITIAL MEDICATIONS

Typical adult doses for exam study; follow your institution's or agency's protocols. EMTs: aspirin and assisting with the patient's own nitroglycerin.

DRUG	TYPICAL DOSE	KEY POINT
Aspirin	162-325 mg chewed; then 75-100 mg daily	Even if on daily aspirin
Ticagrelor	180 mg load	Preferred over clopidogrel; dyspnea
Prasugrel	60 mg load	Also preferred; PCI only; no stroke/TIA; usually avoid 75+
Clopidogrel	600 mg for PCI; 300 mg with lytic	Lytic at 75+: 75 mg, no load
Heparin (UFH)	PCI: 70-100 units/kg to ACT; lytic: 60 units/kg (max 4,000)	Or bivalirudin, enoxaparin
Nitroglycerin	0.4 mg SL every 5 min, max 3	Only if SBP ≥90
Oxygen	Only if SpO2 under 90%	No routine use
Beta-blocker	Oral, within 24 h	Not with HF, shock risk or block

SAFETY No nitrates: SBP under 90 (or 30 below baseline), RV infarct, sildenafil or vardenafil in past 24 h, tadalafil 48 h, avanafil 12 h. Opioids only if nitrates fail. No NSAIDs except aspirin.

FIBRINOLYSIS AND REPERFUSION

Absolute contraindications:

- Any prior intracranial hemorrhage
- Cerebral AVM or malignant brain tumor
- Ischemic stroke within 3 months
- Suspected aortic dissection
- Active bleeding or bleeding disorder (not menses)
- Head/face trauma within 3 months; brain/spine surgery within 2 months
- BP over 180/110 despite emergency treatment

Relative: BP over 180/110 on arrival, oral anticoagulant, recent internal bleeding, pregnancy, prolonged CPR. No lytic for ST depression alone unless posterior STEMI. Reperfusion signs at 60-90 min:

- Pain relief
- ST elevation down ≥50% (2025 ACC/AHA: ≥70% if inferior)
- Reperfusion rhythm: classically AIVR, usually benign

EXAM TIP Failed reperfusion (ongoing pain, poor ST resolution, instability): immediate rescue PCI.

SAFETY Post-lytic headache, confusion or new deficit: suspect a brain bleed; stop antithrombotics, emergency head CT.

COMPLICATIONS

COMPLICATION	TIMING	CLUES
VF or pulseless VT	Most within 48 h	Defibrillate per ACLS
Papillary muscle rupture	3-5 days	Inferior/lateral MI; pulmonary edema; murmur may be absent
Septal rupture (VSD)	3-5 days	New pansystolic murmur; O2 step-up RA to PA
Free wall rupture	3-5 days; 24-48 h after lytics	Tamponade, PEA; late reperfusion raises risk
Cardiogenic shock	Any time	5-10% of acute MI; 40-50% short-term death

- Shock: emergency culprit PCI or CABG, any time; no routine non-culprit PCI
- Impella: reasonable in selected STEMI shock; more bleeding, limb ischemia and renal replacement (such as CRRT)
- Routine IABP or VA-ECMO: no survival benefit

SAFETY New murmur, flash pulmonary edema or collapse days after MI: urgent echo, surgical center, MCS as a bridge.

Sources (26) are listed with links at icubasics.com/sheets/acs-stemi.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.