Cardiorespiratory Look-Alikes and Special Patients

Which heart failure, syncope risk, chest pain mimics, lead reversal, IO and crush fluids, oxygen targets, non-cardiac edema, neck bleeds, and patients with special physiology or equipment

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HEART FAILURE: WHICH SIDE, AND IS IT THE HEART?

PICTURE	POINTS TO
Crackles, orthopnea, pink frothy sputum, S3 (extra sound just after S2)	Left failure: fluid backs into the lungs
JVD, pitting edema, big tender liver, ascites, clear lungs	Right failure: systemic congestion; commonest cause is left failure
Wheeze plus JVD, crackles, edema, CHF, diuretics or missed dialysis	"Cardiac asthma" (pulmonary edema): CPAP and nitro
Wheeze, prolonged expiration, shark-fin $EtCO_2$, asthma or COPD history	Bronchospasm: see asthma-copd

- Pulmonary edema (NASEMSO): CPAP first; SBP under 100: 250-500 mL fluid, consider norepinephrine; SBP under 160: nitro 0.4 mg SL; SBP 160 or more: 0.8 mg; repeat every 5 min while SBP stays over 100.
- Diuretics give no immediate benefit for most patients and can harm.

SAFETY Worse dyspnea, rising crackles or a falling SpO_2 after a bolus means the heart cannot take the volume: stop the fluid, sit up, CPAP, nitro if BP allows.

YOUNG HEARTS THAT COLLAPSE

CONDITION	CLUE	PARAMEDIC ACTION
Obstructive HCM	Exertional syncope; murmur louder with Valsalva or standing; LVH with deep T inversions	Hypotension: supine, legs up, fluid bolus; no nitro or other vasodilators; pads on
Commotio cordis	Blow to the chest (baseball) then instant collapse in a normal heart	VF: CPR and shock now; survival about 40% if within 3 min, 5% after

SYNCOPE: WHO IS LOW RISK

- High risk: during exertion, lying down or without warning; chest pain or dyspnea; older age; heart disease or a murmur; family history of sudden death; abnormal ECG (QT over 500 ms, delta wave, Brugada, LVH).
- Low risk (vasovagal): young, upright, a trigger (heat, pain, fright), warning symptoms, prompt recovery, normal ECG and vitals.
- Every patient: monitor, 12-lead, glucose. Non-transport of a low-risk patient only with medical direction.

CHEST PAIN LOOK-ALIKES AND THE 12-LEAD

Aspirin, nitro and STEMI destinations: acs-stemi, prehospital-stroke-stemi.

FINDING	DO
Tender chest wall but ischemic story or ST depression	Treat as possible ACS: tenderness does not exclude ischemia
Low ACS likelihood, likely non-cardiac (blunt chest trauma)	Defer aspirin and nitro; treat pain; keep monitoring
Lead I all negative (P, QRS, T), aVR upright, normal chest leads	Arm leads reversed: fix electrodes and repeat before reading
First ECG not diagnostic, symptoms continue	Serial 12-leads

INFECTION, CLOTS AND VEINS

CONDITION	CLUE	ACTION
Infective endocarditis	IV drug use or prosthetic valve, weeks of fever, new murmur, painful fingertip nodules, stroke	Treat sepsis or stroke; 12-lead (heart block); report the suspicion
Acute limb ischemia	Sudden pain, pale, cold, pulseless, numb, weak leg; often a clot from the heart (atrial fibrillation)	Note onset time; analgesia; urgent vascular-capable hospital
SVC syndrome	Cancer or central line; face and arm swelling, fixed neck veins, worse lying flat	Head up, oxygen; watch for stridor

ACCESS AND FLUIDS: SHOCK AND CRUSH

- Shock: no IV after two attempts or 90 seconds: IO. Boluses of about 500 mL toward MAP 65, up to 30 mL/kg unless pulmonary edema develops (prehospital-sepsis).
- Conscious IO patient: lidocaine 0.5 mg/kg (max 40 mg) slow through the needle.
- Crush: 1,000 mL normal saline before release, not lactated Ringer's (potassium). Significant crush or long entrapment: consider bicarbonate 1 mEq/kg (max 50 mEq). After release NS 500-1,000 mL/h.
- Watch the monitor at release: peaked T, wide QRS, lost P waves: calcium, bicarbonate, albuterol 5 mg.

OXYGEN TARGETS BY PATIENT

PATIENT	TARGET
Most patients	94-98%
Hypercapnic risk: COPD, morbid obesity, CF, chest wall or neuromuscular disease	88-92% (asthma-copd)
Pulmonary fibrosis or other ILD	94-98% or the highest reachable
SpO_2 below 85%, no hypercapnic risk	Reservoir mask 15 L/min, then step down
Known low baseline (Glenn, cyanotic heart)	The documented baseline

EXAM TIP Silent hypoxemia (viral pneumonia): comfortable but SpO_2 82% with a good waveform is real. Titrate oxygen; awake proning if it lifts the SpO_2; these patients can crash fast.

PULMONARY EDEMA THAT IS NOT HEART FAILURE

CAUSE	CLUE	CARE
Negative-pressure edema	Pink frothy sputum and crackles minutes after choking or laryngospasm	Oxygen, CPAP or PEEP; diuretics are of doubtful value; usually clears in 12-24 h
EVALI	Vaping (informal THC cartridges); cough, dyspnea plus vomiting, diarrhea, fever	Ask about vaping; oxygen, NIV if severe; can worsen within 48 h
Missed dialysis	Anuric, overloaded	CPAP, nitro; only dialysis removes the fluid

SAFETY CPAP stays on until the patient is on the ED stretcher with hospital CPAP ready, or a physician at the bedside stops it. Breaking the seal can cause abrupt decompensation.

NECK, AIRWAY AND CHEST AIR

PROBLEM	CLUE	DO
Post-tonsillectomy bleed	Within 14 days of surgery	Sit upright with suction ready, or on the side to keep blood out of the airway; IV; no probing; ENT-capable ED
Thyroid surgery hematoma	Neck swelling, trouble swallowing, anxiety, fast breathing, stridor (late)	Head up, high-flow oxygen, call ahead so surgery and airway teams wait
Bronchial foreign body	Cough began in dental work or eating; one-sided wheeze	Albuterol relief does not exclude it; imaging and bronchoscopy
Pneumomediastinum	Chest pain, neck crepitus, Hamman crunch after breath-held inhalation or straining	Oxygen, comfort, transport; no positive pressure unless failing
CF hemoptysis	Bright blood during an exacerbation	Bleeding side down, suction, oxygen, no cough suppressant; CF center

SPECIAL PHYSIOLOGY AND EQUIPMENT

Trach and vent troubleshooting: vent-liberation, rsi-airway.

PATIENT	KEY POINT	DO
PAH on IV or SC prostacyclin	Pump stopped: rebound pulmonary hypertension, RV failure, syncope	Restart with the backup pump; avoid hypoxia and hypotension; small boluses only; no nitro; PH center
Glenn (awaiting Fontan)	SpO_2 runs low (one ICU survey: post-op targets mostly 76-85%); the child's own baseline is what counts	Use the documented baseline; treat a fall below it; avoid needless positive pressure; cardiac center
Home ventilator failing	Power or battery lost, falling SpO_2	Bag-valve to the trach; DOPE; bring the go-bag; transport

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