Drawing ICU Labs: Order of Draw, Cultures and Timed Labs

Order of draw, line draws without contamination, blood cultures, blood gases, labeling and the labs that run on a clock

WHAT YOU WILL DO

- Draw most labs yourself: from an arterial line, a central line or by venipuncture.
- Collect blood, urine and sputum cultures, often at the start of a sepsis workup.
- Keep timed labs on time: heparin levels, infusion glucose checks, serial troponin and repeat lactate.
- Label every tube at the bedside, and protect the patient from line contamination and needless blood loss.

ORDER OF DRAW (CLSI)

The order keeps one tube's additive from carrying into the next: EDTA carried forward raises potassium and lowers calcium.

ORDER	TUBE	TYPICAL TESTS
1	Blood culture bottles	Cultures
2	Citrate (light blue)	PT/INR, aPTT, fibrinogen
3	Serum, with or without clot activator or gel (red, gold)	Chemistries, drug levels
4	Heparin (green)	Plasma chemistries, ammonia
5	EDTA (lavender)	CBC, type and screen in many labs
6	Glycolytic inhibitor (gray)	Glucose or lactate by some labs

EXAM TIP Butterfly (winged) set with a citrate tube first: draw a discard tube first to fill the tubing's air space, or the light blue tube will underfill.

DRAWING FROM ARTERIAL AND CENTRAL LINES

1. Hand hygiene, gloves; scrub the hub or sampling port and let it dry.
2. Pause infusions in the other lumens per policy; draw from the lumen your policy names, never one running heparin, TPN or a drug you are testing for.
3. Clear the dead space: use a closed blood-conservation reservoir, or waste per policy (often at least twice the catheter and tubing volume; more before coagulation tests).
4. Draw the tubes in order, then flush the lumen and the sampling port clear of blood and restart the infusions.
5. Arterial line: re-check the waveform and the stopcock position before you leave.

SAFETY A glucose, potassium or coagulation result that makes no sense is contamination from the infusion or flush until proven otherwise. Redraw peripherally or after a proper waste before anyone treats it.

BLOOD CULTURES

- Two sets (aerobic plus anaerobic bottle each) from two separate venipunctures before antibiotics, as long as that does not delay them.
- Adults: 20 mL per set, 10 mL per bottle. Volume is the biggest factor in finding bacteremia.
- Chlorhexidine-alcohol skin prep, dry fully; scrub the bottle tops. Do not touch the site again.
- Butterfly: aerobic bottle first. Syringe: anaerobic bottle first. Short on blood: aerobic bottle first.
- Avoid drawing through an existing line unless the team is evaluating line infection; then label which line and which peripheral site.
- Urine: from the catheter sampling port, never the bag. Sputum: suction trap from the airway, before antibiotics.

BLOOD GASES, LABELS AND TIMED LABS

- Blood gas: heparinized plastic syringe, all air out, capped; analyze within 30 minutes at room temperature with no ice (sooner if pO_2 matters). A venous gas is fine for pH and pCO_2 trends; lactate need not be arterial.
- Label at the bedside with two identifiers, time and your initials, in front of the patient. Never prelabel.

TIMED LAB	WHEN
Heparin infusion: anti-Xa or aPTT	About 6 hours after a start or rate change, per the nomogram
Insulin infusion glucose	Hourly; start insulin at 180 mg/dL (10 mmol/L) or above, target 140–180 mg/dL (7.8–10 mmol/L)
Troponin (high-sensitivity preferred)	At arrival (0) and 1–3 hours later by the assay pathway; CK-MB and myoglobin add nothing
Lactate in sepsis	Repeat within 2–4 hours if the first is above 2 mmol/L (18 mg/dL)

CALL FOR HELP WHEN

- A critical result comes back: read it back and tell the provider now.
- Cultures cannot be drawn without delaying antibiotics: give the antibiotics and tell the team.
- You cannot draw from a line, or it will not flush: do not force it.
- A result does not fit the patient and contamination is possible.

Check your unit's policy for waste volumes, which lumen to draw from, who may draw from an arterial line, and the heparin and insulin protocols. For normal ranges, see the Lab Values page.

Sources (11) are listed with links at icubasics.com/sheets/icu-blood-samples.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.