



VENIPUNCTURE ORDER OF DRAW

1

CULTURES

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2

LIGHT BLUE

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3

SERUM

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4

GREEN

—

5

LAVENDER

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6

GRAY

1 STERILE / BLOOD CULTURE

Container: culture bottles or yellow SPS tube
Specimen: whole blood for microbiology
Key: strict skin antisepsis; collect before other tubes. Bottle sequence depends on device and facility protocol.

2 LIGHT BLUE - CITRATE

Additive: 3.2% sodium citrate
Tests: PT/INR, aPTT, D-dimer, coagulation
Critical: 9:1 blood-to-additive ratio; fill to line. Typical inversions: 3-4.

3 SERUM - RED / GOLD / TIGER

Red: glass may have no additive; plastic commonly has clot activator
Gold/tiger SST: clot activator + gel
Uses: chemistry, serology. Let clot fully before centrifuging. Typical inversions: 5 for additive tubes.

4 GREEN - HEPARIN

Additive: lithium or sodium heparin; PST also has gel
Specimen: plasma
Uses: many chemistry tests and STAT testing
Typical inversions: 8-10. Check the test's required heparin type.

5 LAVENDER / PINK - EDTA

Additive: EDTA
Lavender uses: CBC, smear, reticulocyte count, HbA1c
Pink uses: blood bank testing
Specimen: whole blood. Typical inversions: 8-10. Clots invalidate many tests.

6 GRAY - GLYCOLYTIC INHIBITOR

Additives: commonly sodium fluoride + potassium oxalate
Uses: glucose, lactate, blood alcohol per lab protocol
Action: slows glycolysis; does not instantly stop it
Typical inversions: 8-10.

SERUM vs PLASMA vs WHOLE BLOOD

Serum: liquid after blood clots; fibrinogen and most clotting factors are consumed/removed.
Plasma: liquid from anticoagulated blood; retains fibrinogen and clotting factors.
Whole blood: cells + plasma together; do not centrifuge when the test requires whole blood.
Memory: clot = serum; anticoagulant = plasma.

SPECIALTY TUBES: READ THE ADDITIVE

Royal blue: trace elements; additive varies, so its position follows its additive.
Yellow ACD: HLA, DNA, genetics; not the same as yellow SPS.
Black: citrate tube for ESR in some systems.
Tan: lead testing in some systems.
Rule: cap color is a cue, not proof. Confirm the label and manufacturer.

HIGH-YIELD ORDER-OF-DRAW TRAPS

Butterfly + light-blue tube: if the citrate tube is first, use a discard tube to fill the tubing's air space; the discard tube does not need to be full. Never transfer blood between tubes: additives can carry over and the receiving tube may be overfilled. Mix gently: invert - do not shake. Under-mixing can clot anticoagulated specimens; vigorous shaking can hemolyze. Fill matters: citrate tubes are especially volume-sensitive. Manufacturer rules win: inversion counts, cap colors, and specialty-tube placement can vary.

**VENIPUNCTURE: SAFE SEQUENCE**

1. Review the order. Gather the correct tubes and supplies; check restrictions such as fasting, timing, allergies, and isolation.
2. Identify. Ask the patient to state two identifiers; compare them with the order and wristband. Never use room number as an identifier.
3. Explain and position. Obtain cooperation; seat or recline safely. Ask about prior fainting, difficult draws, and limb restrictions.
4. Hand hygiene and gloves. Apply the tourniquet about 3-4 inches above the site. Avoid vigorous fist pumping.
5. Select the vein. Palpate; median cubital is usually first choice. Keep total tourniquet time to 1 minute or less.
6. Clean and let dry. Use the required antiseptic. Do not blow, fan, wipe, or touch the cleaned site.
7. Anchor and enter. Anchor below the site; bevel up; typically enter at 15-30 degrees. Do not probe blindly.
8. Collect in order. Release the tourniquet as soon as practical and before needle removal. Fill and gently invert each additive tube.
9. Finish safely. Place gauze, remove the needle, activate the safety device, and discard immediately in a sharps container.
10. Hemostasis and label. Apply firm pressure until bleeding stops. Label at the bedside/in the patient's presence; confirm identifiers again.

EQUIPMENT + DRAW BASICS

Gauge: larger number = smaller bore. A 21-gauge straight needle is common for routine adults; 22-gauge may suit smaller veins; 23-gauge winged sets may suit small/fragile veins. Select for the patient, vein, test, and policy. Evacuated system: closed, multi-tube collection. Syringe: gives manual control but blood must be transferred with a safety device - never push through the needle. Follow policy on maximum attempts and obtain help early.

VEIN AND LIMB SELECTION

1st: Median cubital - usually large, stable, and least painful.
2nd: Cephalic - often accessible on the thumb side.
Basilic: caution - closer to nerves and the brachial artery; use only with skill/policy.

Avoid hematoma, edema, burns, scars, infection, and damaged veins. An arm with an IV, fistula/graft, or prior lymph-node surgery requires facility-approved site selection; do not improvise.

COMPLICATION: FIRST ACTION

Hematoma/swelling: stop; release tourniquet; remove needle; firm pressure.
Sharp/electric nerve pain: stop immediately; remove needle; document/report per policy.
Syncope: stop; remove needle; protect from falling; recline/call for help.
Arterial puncture: stop; remove needle; firm pressure at least 5 minutes and longer as needed/policy.
No blood: check tube engagement and needle position; make only small safe adjustments. Never fish or probe.
Seizure/vomiting: stop, remove needle if safe, protect airway/injury, summon help.

CAPILLARY COLLECTION: SITES, ORDER, TECHNIQUE

Adult/child finger: lateral side of the distal pad of the middle or ring finger. Avoid thumb, index finger, little finger, swollen/cyanotic/callused sites, and the center of the pad. Infant heel: medial or lateral plantar surface. Avoid the arch, center, posterior curve, and prior punctures. Use an infant-appropriate device; heel puncture depth should not exceed 2.0 mm.
Capillary order of draw: 1) blood gases, 2) EDTA specimens, 3) other additive specimens, 4) serum specimens. This differs from venipuncture because platelet clumping begins quickly.
Technique: warm only according to policy; cleanse and air-dry; puncture across fingerprint lines; wipe away the first drop unless the test/device procedure says otherwise; let drops form freely. Avoid strong squeezing or milking, which can cause hemolysis and tissue-fluid contamination. Mix additive microcontainers as collected; seal and label immediately.



STANDARD PRECAUTIONS + SHARPS

Treat all blood and body fluids as potentially infectious.

- Perform hand hygiene before and after patient contact and after glove removal.
- Wear gloves for blood collection; add gown, mask, and eye/face protection when splash is possible.
- Activate the needle safety feature immediately after removal.
- Never bend, break, shear, or remove a contaminated needle by hand. Do not recap unless no alternative exists and the approved one-hand/mechanical method is used.
- Discard the entire device immediately into a closable, puncture-resistant, leak-resistant, labeled sharps container located near use.
- Clean spills with approved disinfectant and required contact time; keep food, drink, cosmetics, and phones out of collection/work areas.

SPECIMEN QUALITY + REJECTION

Label in the patient's presence: required identifiers, collection date/time, and collector ID per policy. The tube and order must match.

Common rejection causes: unlabeled/mislabeled specimen; wrong tube/additive; quantity not sufficient; underfilled citrate tube; clotted anticoagulated specimen; gross hemolysis; contamination; broken/leaking container; delayed or incorrect temperature/light transport.

Hemolysis: may falsely increase intracellular analytes such as potassium and LDH. Causes include traumatic draw, wet antiseptic, forceful transfer, strong syringe pull, vigorous shaking, and a too-small needle for conditions.

Hemoconcentration: can follow a tourniquet over 1 minute, fist pumping, or prolonged stasis.

Transport: use a sealed leak-resistant biohazard bag; keep paperwork separate. Follow the receiving lab's exact time, temperature, light, and centrifugation rules.

EXPOSURE RESPONSE

Needlestick/cut: wash promptly with soap and water. Do not squeeze aggressively or apply bleach/caustic agents.

Eyes/nose/mouth: flush with water; use an eyewash for eye exposure. Then: report immediately, document, and obtain confidential medical evaluation. Time matters because indicated post-exposure prophylaxis works best when started promptly. Follow the employer's exposure-control plan.

PROCESSING + CENTRIFUGE

Serum: allow complete clot formation before centrifugation; premature spinning can leave fibrin.

Plasma: collect in the correct anticoagulant and mix promptly.

Centrifuge: inspect tubes; cap them; balance opposite positions with equal mass; lock the lid; never open while spinning or stop the rotor by hand.

Special handling: bilirubin is commonly protected from light. Other chilled, warmed, timed, or STAT specimens must follow the lab's test-specific instructions.

TERMS TO KNOW

Hemolysis: RBC rupture
Lipemia: excess lipid/turbid serum
Icterus: bilirubin-related yellow color
Petechiae: pinpoint capillary bleeding
Ecchymosis: larger bruise
Hematoma: blood pooled in tissue
Syncope: fainting
Hemostasis: stopping bleeding

LEGAL + QUALITY

Consent: permission; respect refusal.
Confidentiality: protect patient information.
Assault: threat/fear of unwanted contact.
Battery: unauthorized touching/procedure.
Negligence: failure to use reasonable care.
Chain of custody: documented control from collection through testing.
QC: monitors test performance. QA: evaluates the total process.

PATIENT ID TRAPS

Use two independent identifiers such as full name and DOB/medical-record number.

Never use room/bed number.

For an unconscious, unidentified, pediatric, or language-barrier patient, use the facility's approved identification process.

Never prelabel tubes away from the patient.

Resolve discrepancies before collecting.

NUMBERS + DISTINCTIONS TO MEMORIZE

2 identifiers | 3-4 in tourniquet above site | 1 min max tourniquet time | 15-30 degrees typical needle angle | 9:1 blood-to-citrate ratio | 2.0 mm max infant heel depth | higher gauge = smaller bore

Venipuncture order: cultures > citrate > serum > heparin > EDTA > gray | Capillary order: gases > EDTA > other additives > serum | Serum clots; plasma is anticoagulated. Apply pressure until bleeding has fully stopped - longer for anticoagulated patients.