Lab values: blood counts, clotting, chemistry

Normal ranges, what changes your care, and how urgent it is

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1 AT A GLANCE

A lab result is only a number until you ask what it means for this client, and what you'll do about it. These are general adult values: ranges differ by lab and by population, so use your own lab's range.

Blood count (general adult ranges)

Test	Normal	Watch for
White cells	4,500 to 11,000 cells/mcL	**Low**: infection risk (chemotherapy, radiation, marrow failure, autoimmune disease, some viruses and drugs). **High**: most often bacterial infection; also inflammation, burns, pregnancy, the stress of surgery
Hemoglobin	Men about 13 to 18 g/dL; women 12 to 16 g/dL	**Low**: anemia, from bleeding, a failing marrow or red cells breaking down: fatigue, a fast pulse, breathlessness. **High**: often dehydration; also long-term low oxygen, smoking
Hematocrit	Men about 40 to 55%; women 36 to 48%	**High**: dehydration
★ **Platelets**	150,000 to 400,000 cells/mcL	**Under 150,000**: thrombocytopenia. **Under 50,000 cells/mcL**: bleeding risk rises. **Over 400,000**: can raise the risk of clots

Read it with fluid status: A hemoglobin that rises after fluid loss may simply mean the blood is concentrated.

What the blood count changes

- Neutrophils fight infection, so the differential matters most. A very severe infection can push the count down: a low number doesn't rule infection out.
- ★ After chemotherapy, a low count plus a fever of **100.4 °F (38 Celsius) or higher is an emergency**, even if the client feels fine.
- Low platelets: follow your facility's bleeding precautions; report new bruising or bleeding right away.
- ★ On heparin, falling platelets can mean HIT: report it, because heparin may need to stop. Usually days 5 to 10, earlier after recent heparin; judge the relative fall, not an exact day.
- In most stable adults, consider red cells below a hemoglobin of 7 g/dL, individualized to the client.

Clotting tests

Test	Normal	On a blood thinner
PT	11 to 13.5 seconds	Longer on warfarin
★ **INR**	About 0.8 to 1.1	Warfarin: **usually 2 to 3**; the target depends on why it's prescribed
aPTT	About 25 to 35 seconds	Heparin infusion: aPTT or anti-Xa, per protocol

Warfarin: INR above 3: bleeding risk; below 2: clot risk. A high INR means notify the prescriber before the next dose.

Chemistry (general adult ranges)

Test	Normal	Low	High
★ **Fasting glucose (at least 8 hours)**	70 to 99 mg/dL	**Under 70 mg/dL**: hypoglycemia: shakiness, sweating, a fast heartbeat, confusion; under 54 mg/dL is level 2	100 to 125 mg/dL: prediabetes. **126 mg/dL or more**: diabetes, if confirmed
A1C (3-month average)	Under 5.7%	—	5.7 to 6.4%: prediabetes. **6.5% or more**: diabetes, if confirmed. Goal for many with diabetes: under 7%
★ **Sodium**	135 to 145 mEq/L	Brain cells swell: confusion, headache, vomiting, cramps, seizures. From diuretics, vomiting, heart failure, SSRIs	Usually water loss: sweating, diarrhea, burns, or a client who can't drink enough
★ **Potassium**	About 3.5 to 5 mEq/L	Weakness, cramps, palpitations, dangerous rhythms; **digoxin toxicity more likely**. From diuretics, vomiting, diarrhea, laxative overuse, low magnesium	Often no symptoms; palpitations, a slow, weak or irregular pulse; can stop the heart. From kidney failure, ACE inhibitors, spironolactone, tissue damage
Calcium	Total about 8.5 to 10.2 mg/dL; ionized calcium has its own, lower range	—	—

Glucose and A1C: Diabetes needs a second abnormal test, unless hyperglycemia is unequivocal. A random glucose of 200 mg/dL or more often means diabetes. A normal glucose this morning doesn't cancel a high A1C.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

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1 AT A GLANCE, CONTINUED

How urgent is it? (example values: your facility sets its own)

Rung	Example	What you do
Expected	WBC 12,000 cells/mcL the day after surgery	Document it; keep watching the trend
Watch	A1C 7.4% in known diabetes	Report it routinely, and teach
Act now	INR 4.6 on warfarin; very low platelets	Report it now; protect the client
★ **Emergency**	Potassium 6.4 mEq/L with an irregular pulse; glucose 40 mg/dL with confusion	Treat what you can, call rapid response, and stay with the client

The drug moves it up: Symptoms, trends and the client's medicines move a result up the ladder. A potassium of 3.3 mEq/L is a watch item on its own, but act-now before digoxin or a diuretic.

Reading a result

- Ask: is it new, is it getting worse, and what does it mean for this client and their medicines?
- Compare with the last results: a slow trend tells a different story from a sudden change.
- Check the timing: a fasting and a random glucose are read against different numbers.

Warfarin and heparin checks

- The INR drifts with a wrong dose, alcohol, new antibiotics, supplements and diet: ask what changed.
- Teach: keep vitamin K foods steady; avoid alcohol, cranberry and grapefruit; report nosebleeds, bleeding gums, dark urine or black stools.
- Before a heparin drip: baseline aPTT, INR and platelets. Then the aPTT is checked often; the protocol sets the range and adjusts the rate.

2 PRIORITY AND SAFETY CALLS

★ A critical result changes your priorities: **report it to the provider promptly, before routine tasks**.

★ Glucose under 70 mg/dL: **treat the low before you give anything else**. Check glucose before insulin.

INR above 3 on warfarin, even without bleeding: notify the prescriber before giving the dose.

Digoxin due and the potassium is low: report the potassium before giving the digoxin.

New confusion on a diuretic: check the sodium.

Potassium of 6.4 mEq/L with a slow, irregular pulse: the heart is already affected, so report it first.

3 EXAM ANCHORS

1. Compare results with normal, and act on them.
2. Classic stems: a high INR, low platelets, a low white count with fever, potassium before a diuretic or digoxin, sodium with new confusion.
3. Report first? Compare the dangers, not just how far each number is from normal.
4. Warfarin follows the INR; heparin follows the aPTT or anti-Xa.
5. Sodium affects the brain, and potassium the heart.
6. Traps: treating every abnormal value as urgent, missing the one that is, and forgetting the drug the value affects.

4 SELF-QUIZ

1. Normal platelets: 150,000 to _____ cells/mcL.
2. On warfarin, the INR target is usually 2 to _____.
3. Normal sodium: 135 to _____ mEq/L.
4. Hypoglycemia is a glucose under _____ mg/dL.
5. After chemotherapy, a low white count with a fever of _____ °F (38 Celsius) or higher is an emergency.
6. An A1C of _____ % or more points to diabetes, if confirmed.
7. A heparin infusion is guided by the aPTT or an _____ level, per protocol.

ANSWER KEY 1. 400,000 · 2. 3 · 3. 145 · 4. 70 · 5. 100.4 · 6. 6.5 · 7. anti-Xa

5 SOURCES

1. MedlinePlus, CBC blood test. medlineplus.gov/ency/article/003642.htm
2. MedlinePlus, Prothrombin time (PT). medlineplus.gov/ency/article/003652.htm
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4. MedlinePlus, Basic metabolic panel. medlineplus.gov/ency/article/003462.htm
5. MedlinePlus, Hemoglobin A1C test. medlineplus.gov/ency/article/003640.htm
6. CDC, Preventing Infections in Cancer Patients: Neutropenia and Risk for Infection. cdc.gov/cancer-preventing-infections/patien…
7. Open RN, Nursing Pharmacology 2e, 6.12 Blood Coagulation Modifiers. wtcs.pressbooks.pub/pharmacology/chapter/6-12-blood-coa…
8. American Society of Hematology, Heparin-induced thrombocytopenia guidelines. hematology.org/education/clinicians/guidelines-and…

Built from RN PocketPal course lessons: Lab values I: blood counts, clotting and chemistry (c06-l02). Every line on this sheet comes from those lesson scripts.

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