BOOST CRNA

Med Math & Clinical Cheat Sheet

The medication-math calculations and critical-care fundamentals CRNA programs expect you to know cold.

A study aid, not a clinical reference. Verify every dose against an authoritative source, and follow your own institution's protocols, before any clinical use.

Conversions to know cold

- 1 kg = 1000 g · 1 g = 1000 mg · 1 mg = 1000 mcg
- 1 kg = 2.2 lb (lb ÷ 2.2 = kg)
- 1 L = 1000 mL · 1 tsp ≈ 5 mL
- A 1% solution = 10 mg/mL
- 60 min = 1 hr, for converting mcg/min to mcg/hr

The calculations you must know

Desired over have

Volume = (desired dose ÷ available concentration) × volume per unit

Order 40 mg; the vial is 80 mg in 2 mL. (40 ÷ 80) × 2 = 1 mL.

Weight-based dose

Dose = ordered (mg/kg) × weight (kg)

Propofol 2 mg/kg for a 70 kg patient. 2 × 70 = 140 mg.

IV drip rate

gtt/min = (volume mL × drop factor gtt/mL) ÷ time in minutes

1000 mL over 8 hours with a 15 gtt/mL set. (1000 × 15) ÷ 480 ≈ 31 gtt/min.

Infusion rate from a weight-based dose

mL/hr = (mcg/kg/min × weight kg × 60) ÷ concentration (mcg/mL)

Norepinephrine 0.1 mcg/kg/min, 80 kg, bag of 4 mg in 250 mL (16 mcg/mL). (0.1 × 80 × 60) ÷ 16 = 30 mL/hr.

Percent concentration

A 1% solution = 10 mg/mL (1 g per 100 mL)

Lidocaine 2% = 20 mg/mL, so 5 mL holds 100 mg.

Practice problems

Work each one on paper first, then check yourself.

1. Order 25 mg; the vial is 50 mg/mL. How many mL do you draw up?
   Answer: 25 ÷ 50 = 0.5 mL.
2. Succinylcholine 1.5 mg/kg for a 60 kg patient. What dose?
   Answer: 1.5 × 60 = 90 mg.
3. Infuse 1000 mL over 6 hours with a 10 gtt/mL set. Rate in gtt/min?
   Answer: (1000 × 10) ÷ 360 ≈ 28 gtt/min.
4. Dopamine 5 mcg/kg/min, 90 kg, bag of 400 mg in 250 mL (1600 mcg/mL). Rate in mL/hr?
   Answer: (5 × 90 × 60) ÷ 1600 = 27,000 ÷ 1600 ≈ 16.9 mL/hr.
5. How many mg of lidocaine are in 3 mL of a 2% solution?
   Answer: 2% = 20 mg/mL, so 20 × 3 = 60 mg.
6. Convert 0.5 g to mcg.
   Answer: 0.5 g × 1000 = 500 mg, × 1000 = 500,000 mcg.

Critical-care quick reference

Hemodynamics

- CO = HR × SV (normal roughly 4-8 L/min)
- MAP = DBP + 1/3 (SBP - DBP), target ≥ 65 mmHg
- SV depends on preload, afterload and contractility

Vasoactive drugs

- Pressors raise SVR: norepinephrine, phenylephrine, vasopressin
- Inotropes raise contractility: dobutamine, milrinone, epinephrine
- Dopamine acts across receptors, dose-dependently

ABG, four steps

- pH — acidemia below 7.35, alkalemia above 7.45
- PaCO2 (respiratory) — normal 35-45 mmHg
- HCO3- (metabolic) — normal 22-26 mEq/L
- Compensation — which system is correcting?

Electrolytes to respect

- K+ 3.5-5.0 — high gives peaked T waves, low gives arrhythmias
- Na+ 135-145 — correct slowly to avoid fluid shifts
- Mg2+ and Ca2+ matter for rhythm and contractility

Take it further at boostcrna.com

This is the snapshot. Practice saying this out loud — the clinical question bank and scored practice with Ana are in the Pre-Op app.

For study and interview preparation only — not a clinical reference, and not clinically reviewed. Ranges and doses are summarized and differ by source; confirm against an authoritative reference and your institution's protocols.