High-Alert Meds and Insulin

ISMP list, insulin timing, rule of 15, anticoagulants and reversal, digoxin, IV potassium, naloxone, safe orders and the rights

HIGH-ALERT MEDS (ISMP 2024)

Exam study summary, not a bedside tool. Doses are typical adult ranges; follow your institution's protocols.

High-alert: errors may not be more common, but do more harm. Key ISMP groups:

- Insulin (U-500 singled out); oral sulfonylureas
- Anticoagulants (including LMWH, DOACs); thrombolytics
- Opioids; IV moderate sedation; paralytics
- Concentrated KCl and potassium phosphate, hypertonic saline, IV magnesium
- IV vasopressors, antiarrhythmics, inotropes (digoxin, milrinone)
- Chemotherapy, epidural and intrathecal drugs, TPN, IV oxytocin
- New in 2024: tranexamic acid injection

INSULIN TYPES

Approximate. Degludec lasts 42 h or more.

TYPE	ONSET	PEAK	DURATION
Rapid: lispro, aspart, glulisine	Within 15 min	1–2 h	3–5 h
Short: regular	30–60 min	2–4 h	5–8 h
Intermediate: NPH	1–2 h	4–12 h	12–18 h
Long: glargine	About 2 h	No peak	About 24 h

- Rapid: 0–15 min before the meal; regular: 30 min before. NPO or meal late: follow orders.
- Mixing with NPH: clear (regular or rapid) first, then cloudy NPH.
- Glargine, degludec: never mixed or IV. IV insulin is usually regular; it lowers K.
- U-500, U-300, U-200: never draw from the pen into a syringe; U-500 vials need a U-500 syringe.

EXAM TIP Lows cluster at the peak: 1–2 h after rapid, 4–12 h after NPH.

HYPOGLYCEMIA: RULE OF 15

ADA 2026: level 1, 54–69 mg/dL; level 2, under 54; level 3, needs another person's help.

Signs: shaky, sweaty, hungry, fast pulse, confused. Beta-blockers can mask the fast pulse, not sweating.

1. Under 70, alert, can swallow: 15 g fast carbs (4 oz juice or regular soda, 3–4 glucose tablets).
2. Recheck in 15 min; repeat if still under 70.
3. Above 70, no meal soon: eat a snack; ongoing insulin can cause another low.
4. Not alert or cannot swallow: nothing by mouth; glucagon or IV dextrose per protocol.

SAFETY First treatment: avoid fatty or high-protein foods (chocolate, peanut butter); fat slows the rise.

ANTICOAGULANTS

Andexanet left the US market in December 2025.

DRUG	MONITOR	REVERSAL
Heparin IV	aPTT or anti-Xa; platelets	Protamine
Enoxaparin	None routine	Protamine, partial only
Warfarin	INR	Vitamin K; bleeding: add 4F-PCC
Dabigatran	None routine	Idarucizumab 5 g IV
Apixaban, rivaroxaban, edoxaban	None routine	4F-PCC (off-label)

- Heparin: aPTT 1.5–2× control (label; exam convention 1.5–2.5×) or anti-Xa 0.3–0.7 units/mL, per protocol. Platelets fall over 50% or under 100,000, or new clots: stop heparin, evaluate for HIT.
- Warfarin: INR 2–3 (mechanical mitral valve 2.5–3.5); overlap heparin or LMWH 5 days or more, until INR is in range 24 h.
- Warfarin major bleed: IV vitamin K 5–10 mg. High INR, no bleeding: hold; over 10, add oral vitamin K.
- Steady vitamin K intake (leafy greens), not zero.
- Enoxaparin: no aPTT, but check platelets (CBC); keep the air bubble; do not rub the site.
- No DOACs with mechanical heart valves.

EXAM TIP Exams pair aPTT with heparin and INR with warfarin.

SAFETY Heparin comes in 1,000 to 20,000 units/mL; 1 mL vials mistaken for flush vials caused fatal bleeds. Confirm the strength.

DIGOXIN AND IV POTASSIUM

- Apical pulse for a full minute; under 60 (adult), hold and notify unless parameters differ.
- Check K first. Low K, low Mg, high Ca, kidney impairment and older age raise toxicity risk.
- Toxicity: anorexia, nausea, vomiting (often first); yellow-green vision; confusion; bradycardia, heart block, PVCs.
- Label range 0.5–2 ng/mL; adverse effects likelier above 1.2. Antidote: digoxin immune fab.
- KCl: premixed bags; no concentrate on patient-care units.
- Always diluted, on a pump; usually 10 mEq/h or less.
- Check urine output and kidney function first.

SAFETY Never give KCl IV push. Undiluted concentrate can stop the heart.

OPIOIDS AND NALOXONE

- Check sedation and breathing before each dose.
- Respiratory depression: stop the opioid, stimulate, support breathing, give naloxone.
- Naloxone (adult): overdose 0.4–2 mg IV, IM or subcut; post-op 0.1–0.2 mg IV; repeat every 2–3 min.
- Many opioids outlast naloxone: keep monitoring, redose as ordered.
- Too much, too fast: pain returns, BP and pulse rise, vomiting; withdrawal if opioid-dependent.

EXAM TIP Exams: rising sedation is the early warning; hold the opioid before breathing slows.

LOOK-ALIKES AND THE RIGHTS

Tall Man letters flag the part that differs: hydrALAZINE / hydrOXYzine.

Orders: "units", never "U"; no trailing zero (5 mg, not 5.0); always a leading zero (0.5 mg).

- Six rights (patient, drug, dose, time, route, documentation), checked 3 times.
- Added rights: reason, response, education, refusal.
- At least two identifiers, such as name and date of birth.
- LPN/LVN duties with IV and high-alert drugs vary by state and employer.

SAFETY A room or bed number is never an identifier.

Sources (33) are listed with links at rnbasics.com/sheets/high-alert-meds.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. RN Basics is an independent study aid not affiliated with any certifying body.