ICU Nutrition and Refeeding

When to feed, first-week targets, PN timing, tube checks, residuals, diarrhea and refeeding syndrome

WHEN TO FEED AND BY WHICH ROUTE

SITUATION	PLAN
Cannot eat, resuscitated	EN within 24–48 h (ASPEN/SCCM 2016, ESPEN 2023)
MAP <50, pressors starting or rising	Hold EN (ASPEN/SCCM 2016)
Shock controlled (MAP ≥60), pressors stable or falling	Low-dose EN, 10–20 mL/h (ESICM 2017); watch for bowel ischemia
Bowel ischemia, obstruction, ACS, active upper GI bleed	Delay EN (ESPEN 2023)
Prone, ECMO, paralytics, absent bowel sounds	Not reasons to delay EN (ESICM 2017)
EN impossible	PN days 3–7 (ESPEN), after 7 (ASPEN); sooner if malnourished
EN short of goal in week 1	No supplemental PN before day 7 (ASPEN 2022); ESPEN: case by case

HOW MUCH: WEEK 1 VS LATER

PHASE	ENERGY	PROTEIN
First 7–10 days (ASPEN 2022)	12–25 kcal/kg/day	1.2–2.0 g/kg/day
Week 1 (ESPEN 2023)	≤70% of expenditure early; up to 80–100% of measured after day 3	Build to 1.3 g/kg/day
Recovery	Measured expenditure, or 25–30 kcal/kg/day (ASPEN/SCCM 2016)	1.2–2.0 g/kg; more in burns, trauma, CRRT

- Trophic EN: 10–20 mL/h (EDEN delivered about 400 kcal/day)
- Count hidden calories: propofol 1.1 kcal/mL, clevidipine 2 kcal/mL (labels), D5W 170 kcal/L, CRRT citrate

TRIALS BEHIND THE TARGETS

TRIAL	COMPARED	RESULT
EPaNIC 2011, n 4,640	Supplemental PN from day 8 vs day 1–2	Late PN: fewer infections (22.8% vs 26.2%)
CALORIES 2014, n 2,388	Early PN vs early EN	30-day deaths 33.1% vs 34.2%
NUTRIREA-2 2018, n 2,410	Full EN vs PN in shock	Same deaths; EN bowel ischemia 2% vs <1%
NUTRIREA-3 2023, n 3,044	6 vs 25 kcal/kg/day, less protein, week 1, shock	Same deaths; fewer GI complications
EFFORT Protein 2023, n 1,329	Protein ≥2.2 vs ≤1.2 g/kg/day	No benefit; possible harm in AKI

EXAM TIP Start EN within 24–48 h without waiting for bowel sounds; do not stop feeds for a residual under 500 mL or for diarrhea alone.

TUBES AND ASPIRATION

- Blind-placed tube: x-ray of its whole course before first use; never auscultation (AACN 2016)
- At insertion: watch for distress; capnography if available; aspirate pH ≤5.5 supports gastric
- Mark the exit point; check every 4 h; re-image if it moves
- Head of bed 30–45° (ASPEN/SCCM 2016, SHEA 2022); continuous rather than bolus feeds
- Intolerance: erythromycin 100–250 mg IV every 8 h, or metoclopramide 10 mg IV, for up to 72 h (ESPEN 2023)
- Post-pyloric tube for high aspiration risk or intolerance despite prokinetics

RESIDUALS, INTOLERANCE AND DIARRHEA

- No routine GRVs (ASPEN/SCCM 2016): poor aspiration marker; skipping them left VAP unchanged (NUTRIREA-1)
- If checked, do not hold for <500 mL alone; ESPEN delays EN above 500 mL/6 h
- True intolerance: vomiting, distension, pain, rising bladder pressure, no stool for 3 days
- Diarrhea (≥3 liquid stools/day): keep feeding; check laxatives, sorbitol elixirs, antibiotics, impaction
- C. difficile test: ≥3 unformed stools in 24 h, no laxatives in 48 h (IDSA/SHEA 2017)
- Persistent: mixed-fiber formula; peptide formula for malabsorption (ASPEN)

REFEEDING SYNDROME (ASPEN 2020)

Phos, K or Mg falls 10–20% (mild), 20–30% (moderate), or >30% or with organ dysfunction (severe) within 5 days of starting calories.

RISK FACTOR	MODERATE: 2 NEEDED	SIGNIFICANT: 1 NEEDED
BMI	16–18.5	<16
Weight loss	5% in 1 month	7.5% in 3 months, >10% in 6
Little or no intake	5–6 days	>7 days
Low K, phos, Mg before feeding	Minimally low	Moderately or severely low
Fat or muscle loss	Moderate fat, mild–moderate muscle	Severe

- Thiamine 100 mg before feeding or IV dextrose; daily for 5–7 days if high risk
- Start 10–20 kcal/kg (or 100–150 g dextrose) for 24 h; add a third of goal every 1–2 days
- K, Mg, phos before feeding, then every 12 h for 3 days
- Levels crash: halve calories (ASPEN); phos <2.0 mg/dL: restrict 48 h (ESPEN 2023)

SAFETY IV dextrose alone can trigger refeeding and Wernicke encephalopathy: thiamine first; watch for arrhythmias, weakness and confusion.

GLUCOSE AND DAILY NURSING CHECKS

- Insulin for persistent glucose ≥180 mg/dL; do not target 80–139 (SCCM 2024)
- Glucose at least every 4 h for 2 days (ESPEN); hourly on insulin drips
- Feeds stop while insulin runs: hypoglycemia; adjust per protocol
- Tube mark, nares, head of bed, abdomen, stools
- Delivered vs prescribed volume, hold reasons; volume-based catch-up
- Daily weight, I&O, K, Mg, phos; triglycerides on propofol
- Hang time: closed set 24–48 h, open 8 h (ASPEN); never add drugs to the bag

Sources (27) are listed with links at icubasics.com/sheets/icu-nutrition.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.