NGN NCLEX 2026 ▪ STUDY SERIES

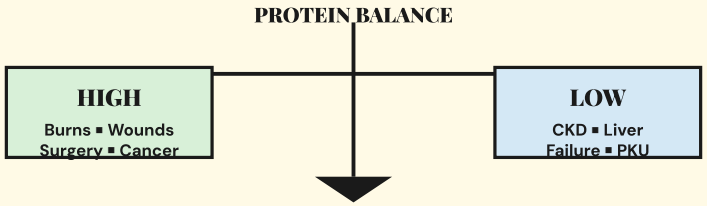
High Protein vs Low Protein Foods

Nutritional Therapy Across Clinical Conditions

NUTRITION ▪ MEDICAL-SURGICAL

1 Definition & Overview

- **Protein** = the body's "building block" macronutrient — essential for tissue repair, immune function, enzymes, hormones, fluid balance (albumin), and oxygen transport (hemoglobin).
- **Recommended Daily Intake (RDI):** ~0.8 g/kg/day for healthy adults. Needs *increase* with stress, healing, and catabolic states; needs *decrease* with impaired protein metabolism.
- **Why it matters on the NCLEX:** Protein modification is a CORE intervention for burns, wounds, surgery, CKD, and liver failure — students must match the diet to the diagnosis.



2 Pathophysiology — Why Protein Needs Change

📈 INCREASED Need (Catabolic States):

Tissue injury or stress → ↑ Metabolic demand & nitrogen loss → Body breaks down own muscle → Need MORE dietary protein to rebuild

📉 DECREASED Need (Impaired Metabolism):

Liver or kidney failure → Cannot process protein byproducts → ↑ BUN, ammonia, urea → Restrict protein to reduce toxic load

🚨 **Key Insight:** In liver failure, protein breakdown produces ammonia → crosses the blood-brain barrier → causes hepatic encephalopathy. In CKD, urea (from protein) accumulates → uremia.

3 Signs & Symptoms — Imbalance Cues

PROTEIN DEFICIENCY

Too Little Protein

- **Hypoalbuminemia** (albumin < 3.5 g/dL)
- **Generalized edema / ascites** (loss of oncotic pressure)
- Poor or delayed wound healing
- Muscle wasting & weakness
- Thin, brittle hair; spoon-shaped nails
- Fatigue, immune suppression, frequent infections
- Children: stunted growth, kwashiorkor

PROTEIN EXCESS (IN DISEASE)

Too Much Protein

- ↑ **BUN** (azotemia / uremia in CKD)
- ↑ **Ammonia → confusion, asterixis** (liver failure)
- Nausea, anorexia, metallic taste
- Worsening kidney function
- Hepatic encephalopathy (slurred speech, lethargy → coma)
- Fluid & electrolyte derangements

🚨 **RED FLAG — Hepatic Encephalopathy:** Asterixis (flapping tremor), confusion, fetor hepaticus → STOP protein, give lactulose, notify HCP.

🚨 **RED FLAG — Uremia in CKD:** BUN rising rapidly, pruritus, uremic frost, pericardial friction rub → urgent dialysis evaluation.

⬆ HIGH-PROTEIN FOODS — "BUILDERS"

ANIMAL MEATS

- Beef, pork, lamb
- Chicken, turkey
- Fish, shellfish, tuna
- Organ meats (liver)

DAIRY

- Milk (whole/skim)
- Greek yogurt
- Cheese (all types)
- Cottage cheese

EGGS

- Whole eggs
- Egg whites (purest protein)
- Egg substitutes

LEGUMES & BEANS

- Black beans, kidney beans
- Lentils, chickpeas
- Split peas, soybeans
- Edamame

NUTS & SEEDS

- Peanuts, almonds, walnuts
- Pumpkin & sunflower seeds
- Peanut/almond butter
- Chia, hemp, flax seeds

PLANT-BASED

- Tofu, tempeh
- Quinoa
- Seitan
- Protein shakes/Ensure

⬇ LOW-PROTEIN FOODS — "FILLERS"

FRUITS

- Apples, berries, grapes
- Watermelon, pears
- Peaches, plums
- Most fresh & canned fruit

VEGETABLES

- Lettuce, cucumber
- Bell peppers, celery
- Onions, carrots
- Most non-starchy veggies

REFINED GRAINS

- White bread, white rice
- Pasta, plain crackers
- Cornstarch, tapioca
- Low-protein bread (specialty)

SUGARS & SWEETS

- Hard candy, jelly beans
- Sugar, honey, syrup
- Sherbet, popsicles
- Jam, jelly

FATS & OILS

- Butter, margarine
- Olive oil, vegetable oil
- Mayonnaise
- Cream, sour cream (small)

BEVERAGES

- Water, herbal tea
- Fruit juice (apple, cranberry)
- Lemonade, soda
- Coffee (black)

4 Priority Nursing Interventions — Match Diet to Diagnosis

CONDITION	PROTEIN NEED	RATIONALE & NURSING ACTION
Burns	**HIGH** (1.5–2 g/kg)	Massive protein loss through wound exudate; needed for tissue regeneration. *Encourage eggs, meats, milkshakes between meals.*
Post-op / Wound healing	**HIGH**	Collagen synthesis & immune support. Pair with Vitamin C and zinc.
Cancer / Chemotherapy	**HIGH**	Catabolic state, poor intake; offer small frequent meals, supplements (Ensure, Boost).
Pregnancy / Lactation	**HIGH** (+25 g/day)	Fetal growth and milk production.
COPD	**HIGH**	↑ work of breathing burns calories; prevent muscle wasting of diaphragm.
HIV/AIDS	**HIGH**	Catabolism + opportunistic infections cause wasting syndrome.
Chronic Kidney Disease (CKD/ESRD)	**LOW** (0.6–0.8 g/kg)	Failing kidneys cannot excrete urea → uremia. *EXCEPTION: dialysis patients need MORE protein* (1.2 g/kg) because dialysis removes amino acids.
Liver Failure / Cirrhosis	**LOW**	↓ ammonia conversion to urea → encephalopathy. Restrict only with elevated ammonia.
Hepatic Encephalopathy	**LOW / Restrict**	Ammonia is neurotoxic. Give lactulose to trap & excrete ammonia.
PKU (Phenylketonuria)	**LOW** phenylalanine	Cannot metabolize phenylalanine → brain damage. Avoid high-protein foods, aspartame.

🚨 **HIGH-YIELD TWIST: A CKD patient who starts *hemodialysis* needs MORE protein, not less! Dialysis pulls amino acids out of the blood — restricting protein in a dialysis patient leads to malnutrition.**

5 Pharmacology & Nutrition Interactions

DRUG / SUPPLEMENT	MECHANISM / USE	NURSING CONSIDERATIONS
Lactulose	Traps NH_3 in colon → excretes via stool	Goal: 2–3 soft stools/day. Used in hepatic encephalopathy WITH low-protein diet.
Albumin (IV)	Volume expander, restores oncotic pressure	Monitor for fluid overload, ↑ BP. Used in burns, ascites, hypoalbuminemia.
Phosphate Binders (sevelamer, calcium acetate)	Bind dietary phosphorus in CKD	Give WITH meals. Dialysis patients on protein-modified diet.
Erythropoietin (Epogen)	Stimulates RBC production in CKD	Adequate iron + protein required for response.
TPN (Total Parenteral Nutrition)	IV nutrition: amino acids, dextrose, lipids	Central line preferred. Accu-checks q6h. Never speed up or slow down rate.
Oral Supplements (Ensure, Boost, Glucerna)	Concentrated calories + protein	Offer between meals, not with, to avoid suppressing appetite.
Levodopa (Parkinson's)	Dopamine precursor	HIGH-protein meals BLOCK absorption — separate from meals.
Tetracycline / Levothyroxine	Antibiotic / thyroid hormone	Avoid dairy/protein within 1 hour — chelates and reduces absorption.

6 ⚠ NCLEX Test Traps — Avoid These Errors

TRAP #1 **Restricting protein in a hemodialysis patient.**

WRONG. Dialysis patients need MORE protein (≈1.2 g/kg) because dialysis removes amino acids. Only PRE-dialysis CKD patients restrict protein.

TRAP #2 **Recommending eggs and chicken to a cirrhosis patient with confusion.**

WRONG. Confusion = hepatic encephalopathy = ammonia is up. Restrict protein and give lactulose. Once mental status clears, gradually reintroduce protein.

TRAP #3 **Equating "low protein" with "low calorie."**

WRONG. Low-protein diets must still be HIGH in calories (carbs, fats) to prevent the body from breaking down its own muscle for energy.

TRAP #4 **Forgetting that burns require MORE protein than even surgery.**

Burn patients lose protein through exudate AND have a hypermetabolic state — the highest protein needs of any patient population.

TRAP #5 **Choosing milk for a tetracycline patient or PKU patient.**

WRONG. Dairy chelates tetracycline (↓ absorption); milk's phenylalanine is dangerous in PKU. Read the diagnosis carefully.

TRAP #6 **Albumin and total protein levels lag behind clinical status.**

Albumin has a 21-day half-life. Use *prealbumin* (2-day half-life) for current nutritional status.

TRAP #7 **Assuming all "plant-based" foods are low protein.**

WRONG. Tofu, tempeh, lentils, and quinoa are HIGH protein. Don't recommend them to a CKD or liver-failure patient who needs restriction.

7 Patient & Family Education

🟢 HIGH-Protein Teaching

- Eat **small, frequent meals** with a protein source at each.
- Add powdered milk to soups, casseroles, mashed potatoes for "hidden" protein.
- Use protein shakes *between* meals — not with — to avoid filling up.
- Keep ready-to-eat protein on hand: hard-boiled eggs, cheese sticks, Greek yogurt.
- Pair protein with Vitamin C (citrus) to enhance iron absorption.
- For burns/wounds: aim for 1.5–2 g/kg/day; weigh weekly.

🔵 LOW-Protein Teaching

- **Read food labels** — protein is listed in grams per serving.
- Keep calories adequate: use butter, oils, jam, hard candy, sugar.
- Watch hidden protein in: gelatin, broths, gravies, processed foods.
- For CKD: also limit **sodium, potassium, and phosphorus**.
- For liver failure: monitor for **confusion or sleep changes** — early signs of encephalopathy.
- Use a renal/hepatic dietitian — these diets are complex.
- Track daily weights and report swelling or shortness of breath.

8 Memory Boosters & Mnemonics

"BUILDERS need PROTEIN"

HIGH-protein indications:
Burns ▪ **U**lcers/wounds ▪ **I**nfection (HIV) ▪ **L**actation/pregnancy ▪ **D**ialysis ▪ **E**RS post-op ▪ **R**espiratory (COPD) ▪ **S**urgery & cancer

"LIVER + KIDNEY = LESS protein"

LOW-protein indications:
Liver failure / cirrhosis with ↑ ammonia
Kidney disease (PRE-dialysis CKD)
PKU (low phenylalanine specifically)
Pattern: failing organ can't process protein → restrict it.

"M.E.A.T."

Top high-protein food categories:
Milk & dairy ▪ **E**ggs ▪ **A**nimal flesh (meat/fish/poultry) ▪ **T**ofu, beans, nuts, lentils

"FRUITS, FATS, FILLERS"

Low-protein safe foods:
Fruits and **F**resh veggies ▪ **F**ats (oil, butter) ▪ **F**illers (white rice, pasta, sugar, hard candy, jam)

"ASTERIXIS = ASSESS for ammonia"

Flapping hand tremor in a liver patient = encephalopathy. STOP protein, START lactulose, NOTIFY HCP.

"PRE-ALBUMIN is PRESENT"

Prealbumin reflects *current* nutritional status (2-day half-life). Albumin reflects status from *3 weeks ago* (21-day half-life).

"DIALYSIS = DOUBLE the protein"

Hemodialysis pulls protein out → patient needs MORE, not less. Don't get tricked by "kidney = restrict protein" — verify dialysis status first.

Diane's NGN NCLEX 2026 Study Series

Nutritional Therapy ▪ High vs Low Protein Foods

Designed for clinical judgment, prioritization, and exam mastery