ANEMIA: TELL THEM APART FAST

Less hemoglobin -> less oxygen delivery -> fatigue, pallor, weakness, and shortness of breath.

PERNICIOUS = ABSORPTION PROBLEM
Lack of intrinsic factor (IF) -> poor B12 absorption -> low B12.
B12 may be in the diet but cannot be absorbed normally.

FOLATE DEFICIENCY = TOO LITTLE B9
Low intake / increased need -> too little folate for RBC formation.
Folate absorption does not require intrinsic factor.

Anemia	What is wrong?	Fast differentiating clues	Typical labs / RBC size	Treatment focus
Iron deficiency	Low iron -> less hemoglobin. Often chronic bleeding, poor intake, or increased need.	**Pica + brittle / spoon nails** Think GI or menstrual blood loss.	**Small RBCs / low MCV** Low ferritin and iron; TIBC usually high.	Replace iron; identify and treat the cause of iron loss.
Pernicious (B12 deficiency)	Autoimmune loss of parietal cells / IF -> poor absorption of vitamin B12.	**Tingling, numbness, unsteady gait** B12 maintains myelin. Glossitis may occur.	**Large RBCs / high MCV** Low B12; IF antibodies support diagnosis.	Lifelong B12 replacement: IM or prescribed high-dose oral therapy.
Folate deficiency (vitamin B9)	Low folate -> impaired DNA synthesis. Poor diet, alcohol use, pregnancy.	**Similar anemia / glossitis, without classic B12 nerve findings.** Think low intake / increased need.	**Large RBCs / high MCV** Low folate. Check B12 too.	Replace folate. Rule out B12 deficiency before giving folate alone.
Hemolytic	RBC destruction is faster than bone marrow replacement.	**Jaundice + dark urine** RBC breakdown raises bilirubin. Spleen may enlarge.	Often normal MCV. **Reticulocytes / indirect bilirubin rise**; haptoglobin often low.	Treat the cause of hemolysis; monitor worsening anemia.
Sickle cell (hemolytic type)	Inherited HbS -> sickling -> hemolysis **and blocked blood flow**.	**Severe pain / vaso-occlusion** Triggers: dehydration, infection, low oxygen.	HbS on hemoglobin testing. Usually normal MCV; reticulocytes often high.	Pain control; correct dehydration; O2 if hypoxemic. Hydroxyurea reduces crises.
Acute blood loss	Bleeding -> loss of circulating volume and RBCs.	**Bleeding + fast pulse / low BP** Think surgery, injury, GI bleed.	Usually normal MCV. **Hgb / Hct may initially look normal.**	Control bleeding; support circulation. Fluids / blood as ordered.

MCV shortcut: Small <80 fL = think iron | Normal 80-100 = blood loss / hemolysis | Large >100 = B12 / folate. Patterns are clues, not proof.

Megaloblastic = impaired DNA synthesis, usually from B12 or folate deficiency; not a separate missing nutrient. **B12 trap:** Not all B12 deficiency is pernicious; poor intake or other malabsorption can also cause it. No nerve symptoms does not rule B12 deficiency out. Folate alone can mask ongoing B12 nerve damage.

Priority: Bleeding with instability, chest pain, or severe dyspnea needs urgent action. Sickle cell + fever / chest pain / breathing trouble: consider acute chest syndrome.

Course: Anemia CMcCain, slides 5-9, 11, 14-20, 22-25. Clarification: IF helps absorb B12, not iron (slide 14); other GI malabsorption is not automatically pernicious (slide 16).

References: NHLBI: B12-deficiency anemia; Merck: B12 deficiency; Merck: evaluation of anemia.

FOOD SOURCES: QUICK STUDY GUIDE

Anemia + electrolytes + diabetes + surgical recovery | Common examples, not a ranked food list.

Nutrient / purpose	Foods to recognize	Quick connection / exam clue
Iron Makes hemoglobin	Lean beef, shellfish, beans, lentils, iron-fortified cereal.	Animal iron is absorbed better. Pair plant iron with **vitamin C** (beans + bell peppers).
Vitamin B12 RBC formation + nerves	Fish, meat, eggs, milk / yogurt; B12-fortified cereal or nutritional yeast.	**Animal foods or fortified foods.** Pernicious anemia needs prescribed B12 replacement; food alone is insufficient.
Folate / B9 RBC DNA synthesis	Spinach / leafy greens, lentils, beans, asparagus; enriched bread or fortified cereal.	**Think greens + beans.** Pregnancy increases need. Check B12 before treating with folate alone.
Vitamin C Iron absorption + collagen	Oranges, strawberries, kiwi, bell peppers, broccoli.	Helps absorb plant iron and supports wound healing. **Fruit + vegetables** are the easy memory cue.
Calcium + vitamin D Bones; calcium also aids muscles	**Ca:** milk, yogurt, sardines with bones, fortified plant milk. **D:** salmon, trout, vitamin-D-fortified milk.	**Vitamin D helps absorb calcium.** Check fortification labels; not all plant milks or yogurts provide both.
Potassium (K+) Cardiac rhythm + muscles	Potatoes, white beans, spinach, avocado, tomato sauce, bananas, orange juice.	**More than bananas!** With high K+ / kidney disease, follow restrictions; many salt substitutes contain potassium.
Magnesium (Mg) Nerves + muscles	Pumpkin seeds, almonds, spinach, black beans, oatmeal / whole grains.	**Seeds + nuts + greens + whole grains.** Low Mg can make low potassium difficult to correct.
Phosphorus (phosphate) ATP energy + bones	Milk / yogurt, chicken, salmon, eggs, beans, nuts / seeds.	**Dairy + protein foods.** If phosphorus is restricted, check processed-food ingredients for added "phos".
Sodium + chloride Fluid balance; chloride aids acid-base	Table salt (sodium chloride), soy sauce, canned soup, deli meats, pickles.	**Salt + packaged / cured foods.** Low blood sodium is often a water-balance problem, not simply low salt intake.
Protein Tissue repair / recovery	Eggs, chicken, fish, Greek yogurt, beans, lentils, tofu.	**Building material for healing.** Resume food according to postoperative orders; follow any kidney-related limits.

DIABETES - everyday carbs / fiber: Oats, whole grains, beans, and whole fruit provide carbohydrates plus fiber. Count portions; these still raise glucose.

LOW GLUCOSE (<70 mg/dL): If awake and able to swallow, give 15 g fast carbohydrate (e.g., 1/2 cup juice), recheck in 15 min, repeat if still low.
Chocolate / peanut butter act too slowly for first treatment. If unable to swallow safely: no oral food; use emergency treatment per protocol.

Cross-check: Beans / greens overlap iron, folate, K+, and Mg; dairy overlaps calcium, phosphorus, B12, and protein. Match choices to labs and orders.
Food supports care; severe electrolyte or acid-base disturbances need treatment of the cause, not a food fix. Do not add iron for every anemia.

Sources: Electrolyte Concept Maps pp. 1-5; Anemia slides 14-18; Diabetes1&2 slides 17-18; postoperative nutrition context slides 9, 14.
Food / clinical clarifications: NIH ODS nutrient fact sheets | CDC: low glucose | NIDDK: eating with diabetes.