

NUTRITION-IN-CONTEXT CLINICAL CASE LIBRARY

Two Parallel Sets for Undergraduate Medical Education and Internal Medicine Residency

Purpose. This case library operationalizes the Nutrition-in-Context component of the longitudinal nutrition education toolkit. The eight medical-student cases are designed for integration into preclinical systems blocks. The eight internal-medicine-resident cases revisit the same clinical themes at a higher level of complexity, emphasizing multimorbidity, pharmacotherapy, hospitalization, transitions of care, and interprofessional management.

How to Use This Library

- Use each case as a 120-minute stand-alone module or compress it to 15, 30, or 60 minutes using the time-flexible instructions.
- For medical students, emphasize physiology, recognition, evidence-based dietary principles, and the four-part framework: ASSESS → INTERPRET → ACT → COLLABORATE.
- For residents, emphasize treatment prioritization, medication-nutrition interactions, risk-benefit tradeoffs, consultation, discharge planning, and longitudinal monitoring.
- Faculty may deliver cases without being nutrition specialists. Each module contains a facilitator answer key, teaching deck outline, evidence summary, readings, and adaptation notes.
- Cases intentionally avoid moralizing food, rigid “good/bad” classifications, and one-size-fits-all diets. Individualization, cultural responsiveness, affordability, and interprofessional care are recurring principles.

Matched Case Map

#	Medical student case	Internal medicine resident case
1	Why Is the Glucose Rising? Energy Balance, Food Quality, and Insulin Resistance	GLP-1 Success, Nutrition Failure? Weight Loss, Protein Adequacy, and Lean-Mass Risk
2	The Hypertension Visit That Is Really a Nutrition Visit	Resistant Hypertension or Resistant Diet? Sodium, Lipids, CKD, and Real-World Food Exposure
3	Diarrhea, Fatigue, and a Missing Nutrient: Malabsorption in Context	Chronic Diarrhea, Weight Loss, and Iron Deficiency: Do Not Miss Malabsorption
4	There Is No “Diabetic Diet”: Individualizing Nutrition in Type 2 Diabetes	The Meal Triad: Preventing Inpatient Dysglycemia Through Nutrition-Insulin Coordination
5	Potassium Is High: When “Eat More Fruits and Vegetables” Needs Context	Hyperkalemia Without Starving the Diet: CKD, RAAS Inhibitors, and Potassium Strategy
6	Iron Deficiency Is a Nutrition Problem—Until It Is Not	Iron Pills Are Not Working: Absorption, Blood Loss, and Medication-Food Interactions

7	The Older Adult Losing Strength: Protein, Bone, and Sarcopenia	Frailty, CKD, and the Protein Paradox
8	Normal Liver Tests Do Not Mean Normal Metabolism: Obesity and MASLD	MASLD in the Era of GLP-1 Therapy: Treat the Liver, the Weight, or the Cardiovascular Risk?

Core Instructional Framework

Step	Learner question
ASSESS	What nutrition information is clinically important?
INTERPRET	How does nutrition interact with physiology, disease, medications, and context?
ACT	What evidence-based action can the physician take now?
COLLABORATE	When and how should the physician involve an RDN or another professional?

Evidence currency. Guideline-centered readings are listed so adopters can substitute the newest version at implementation. The case content reflects major contemporary principles from HHS, ADA, AHA, KDIGO, and AGA guidance available in 2026. Local institutions should update exact thresholds, drug-specific recommendations, and referral pathways before deployment.

SET A: MEDICAL STUDENT CASES

Designed primarily for M1-M2 systems blocks. The emphasis is foundational science translated into clinical reasoning and brief patient counseling.

1. Why Is the Glucose Rising? Energy Balance, Food Quality, and Insulin Resistance

Audience: Medical students (primarily M1-M2) | Primary curricular home: M1 metabolism/biochemistry or endocrine block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Prediabetes and early insulin resistance
Nutrition trigger	A seemingly “healthy” diet that is calorie-dense, low in fiber, and heavy in liquid calories and refined snacks
Primary learner task	Connect macronutrient metabolism to an individualized, non-dogmatic dietary recommendation
HHS competencies	1, 11, 13, 16, 22, 30
Recommended assessment	Case MCQ + two-sentence counseling response

B. Learning Objectives

1. Explain how carbohydrate, fat, and protein enter energy pathways and influence postprandial metabolism.
2. Distinguish energy balance from macronutrient-specific mechanisms in the development of insulin resistance.
3. Identify high-yield dietary history elements in a patient with prediabetes.
4. Recommend one evidence-based dietary pattern or behavior change while acknowledging that no single macronutrient distribution is universally optimal.
5. Identify when referral to an RDN or Diabetes Prevention Program is appropriate.

C. Learner Case

Stage 1. A 42-year-old office manager presents for an annual examination. BMI is 29 kg/m², waist circumference has increased over 3 years, blood pressure is 128/78 mm Hg, fasting glucose is 108 mg/dL, A1c is 6.0%, and triglycerides are 210 mg/dL. The patient asks, “Is this because I eat too many carbs?”

- What physiologic findings suggest insulin resistance?
- What additional history would you obtain before answering the patient’s question?

Stage 2. Dietary recall: coffee with sweetened creamer and a pastry for breakfast; a chicken wrap and chips for lunch; a large rice-based dinner; two sweetened beverages daily; fruit only a few times per week; vegetables mainly at dinner. The patient walks about 3,000 steps/day and sleeps 6 hours/night.

- Which features are most actionable?
- Which findings are not interpretable without knowing portion size, frequency, and patient preferences?

Stage 3. The patient says, “My coworker reversed prediabetes by going keto. Should I stop eating rice completely?”

- How would you answer without framing one diet as uniquely correct?
- Give a two-sentence recommendation that preserves cultural food preferences.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	What foods, beverages, portions, meal timing, physical activity, sleep, and weight trajectory are relevant?
INTERPRET	How do excess energy intake, low fiber, refined carbohydrates, liquid calories, ectopic fat, and insulin signaling interact?
ACT	Choose one or two high-impact changes, such as replacing sugar-sweetened beverages, increasing fiber-rich minimally processed foods, or reducing energy-dense portions.
COLLABORATE	Refer to an RDN and/or evidence-based diabetes prevention program when individualized meal planning or sustained weight-management support is needed.

E. Facilitator Guide and Answer Key

Key reasoning points

- Prediabetes is not adequately explained by a single macronutrient. Energy balance, adiposity, food quality, genetics, sleep, activity, and medication effects can all contribute.
- Insulin resistance increases hepatic glucose output and alters peripheral glucose disposal; progressive beta-cell dysfunction contributes to rising glycemia.
- A low-carbohydrate, Mediterranean-style, plant-forward, or DASH-style pattern can all be reasonable when nutrient quality and energy goals are addressed.

Common misconceptions to correct

- “Carbohydrates cause diabetes” is overly simplistic.
- A food can be nutrient-dense yet still contribute substantial energy depending on portion and preparation.
- A recommendation that is culturally incompatible is unlikely to be sustainable.

Exemplar counseling language

- “There is not one required diet for prediabetes. The biggest opportunities I see are the sweetened drinks, low fiber intake, and portions. We can start with one change that fits how you already eat.”

F. Nutrition Clinical Pearls

- Food patterns matter more clinically than arguing over an ideal carbohydrate percentage.
- Liquid calories and low-fiber refined foods are high-yield targets because substitution is often feasible.
- Nutrition counseling should preserve pleasure, culture, affordability, and patient choice.

G. Evidence Summary

Current diabetes guidance emphasizes individualized meal plans that consider nutrient quality, total energy intake, metabolic goals, preferences, culture, literacy, and access rather than prescribing one universal macronutrient distribution.

For diabetes prevention, multiple dietary patterns can be appropriate. High-quality food choices, physical activity, and sustained weight loss when indicated have the strongest evidence base.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: The metabolic problem	Insulin resistance, beta-cell compensation, hepatic glucose output, and ectopic fat in one diagram.
Slide 2: What did the diet history add?	Highlight liquid calories, refined snacks, low fiber, portions, and cultural staples.
Slide 3: Do carbohydrates “cause” diabetes?	Separate physiology from oversimplified diet claims; emphasize total dietary pattern.
Slide 4: Evidence-based options	Mediterranean-style, DASH, plant-forward, and lower-carbohydrate approaches can be individualized.
Slide 5: Clinical script	One-minute patient-centered recommendation + criteria for RDN/DPP referral.

I. Assessment Package

Question 1. Which is the best initial dietary recommendation for this patient?

- A. Eliminate all rice and fruit
- B. Replace sugar-sweetened beverages with unsweetened alternatives and increase fiber-rich foods
- C. Begin a very-high-protein diet
- D. Avoid all dietary fat

Answer: B

Rationale: It targets a high-yield source of excess energy and poor diet quality while improving sustainability and fiber intake.

Question 2. Why is insulin resistance alone insufficient to explain the patient’s rising A1c?

Answer: Progression to dysglycemia also reflects beta-cell compensation and eventual beta-cell dysfunction, along with hepatic and peripheral metabolic factors.

Rationale: Prediabetes emerges from interacting defects rather than one pathway.

Question 3. Write a two-sentence counseling response to the request to stop eating rice.

Answer: Accept any response that explains there is no need to eliminate a culturally important food and proposes portion, pairing, whole-grain/legume, vegetable, beverage, or activity modifications chosen with the patient.

Rationale: Assesses communication, cultural responsiveness, and evidence translation.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
1	Macronutrient and micronutrient content of foods	Learner links foods to carbohydrate, fat, protein, and fiber content.
11	Principles of a healthy balanced diet	Learner selects an overall dietary pattern rather than a single nutrient rule.
22	Nutrition assessment	Learner obtains a targeted diet and lifestyle history.
30	Evidence-based nutrition in patient care	Learner gives a patient-specific recommendation.

K. Required / Recommended Readings (see appendix for full citations)

- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Swap rice for tortillas, bread, noodles, plantains, injera, or another local staple.
- Can be embedded after glycolysis/insulin signaling rather than taught as a stand-alone nutrition session.
- For a resource-limited setting, add food insecurity and shift-work constraints.
- For an advanced M2 version, add fasting insulin, ALT, or liver fat and ask about MASLD.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Use Stage 1 + Stage 3 only; ask one mechanism question and one counseling question.
30 minutes	Use all three stages; omit formal evidence appraisal and use one assessment question.
60 minutes	Full case discussion + slides 1-5 + assessment questions.
120 minutes	Add pre-reading, small-group dietary recall analysis, counseling role-play, and debrief.

N. Faculty Preparation Checklist

- Review ADA 2026 nutrition recommendations and local DPP/RDN referral pathways.
- Avoid presenting ketogenic, low-fat, vegan, or Mediterranean diets as universally superior.
- Emphasize substitution and feasibility rather than moralizing foods.

2. The Hypertension Visit That Is Really a Nutrition Visit

Audience: Medical students (primarily M1-M2) | Primary curricular home: M1/M2 cardiovascular block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Hypertension, dyslipidemia, sodium, potassium, and fat quality
Nutrition trigger	Restaurant meals, packaged foods, high sodium intake, and replacement of unsaturated fats with saturated fats
Primary learner task	Translate cardiovascular nutrition physiology into a realistic treatment plan
HHS competencies	7, 8, 11, 22, 30, 49
Recommended assessment	Case MCQ + label interpretation + counseling

B. Learning Objectives

6. Explain how sodium and potassium affect blood pressure physiology.
7. Differentiate saturated and unsaturated fat sources in the context of LDL-related cardiovascular risk.
8. Interpret a nutrition label for sodium and saturated fat.
9. Recommend a heart-healthy dietary pattern using substitutions rather than prohibitions.
10. Identify social and environmental barriers to implementing cardiovascular dietary guidance.

C. Learner Case

Stage 1. A 55-year-old teacher has repeated clinic blood pressures around 146/88 mm Hg and LDL-C 162 mg/dL. Kidney function is normal. The patient prefers to avoid medication if possible.

- What dietary factors can meaningfully influence blood pressure and lipids?
- What history should be obtained before advising “eat less salt”?

Stage 2. The patient eats takeout 5 nights/week, deli sandwiches most lunches, very few fruits or vegetables, and cooks with butter because social media posts warned against “seed oils.” A frozen entrée label lists 920 mg sodium per serving, 2 servings per package.

- How much sodium is consumed if the entire package is eaten?
- What is the likely cardiovascular implication of replacing liquid plant oils with butter?

Stage 3. The patient says, “I thought sea salt was healthier than regular salt and butter was natural.”

- How would you respond to each claim?
- Choose two changes most likely to be feasible this week.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Restaurant frequency, packaged foods, sodium sources, potassium-rich foods, alcohol, dietary fat

	sources, weight trend, cooking access.
INTERPRET	Connect sodium balance and vascular physiology to BP; connect saturated-for-unsaturated fat substitution to LDL/CVD risk.
ACT	Reduce sodium-rich packaged/restaurant foods, increase fruits/vegetables/legumes as appropriate, and replace butter/fatty meats with unsaturated fat sources.
COLLABORATE	Use RDN referral when multiple dietary targets, cost constraints, or comorbid disease complicate the plan.

E. Facilitator Guide and Answer Key

Key reasoning points

- Most dietary sodium comes from processed/restaurant foods rather than the salt shaker.
- Potassium-rich whole foods can support BP control in people without contraindications.
- Cardiovascular guidance favors unsaturated fats in place of saturated fats and minimally processed foods in place of ultraprocessed foods.

Common misconceptions to correct

- Sea salt is still predominantly sodium chloride.
- “Natural” does not mean cardioprotective.
- The cardiovascular effect of a fat depends partly on what it replaces.

Exemplar counseling language

- “Rather than focusing on one ingredient, I would target the foods giving you the most sodium and swap butter for an unsaturated oil you like. That lets you keep flavor while addressing both blood pressure and LDL.”

F. Nutrition Clinical Pearls

- Substitution is central to nutrition evidence: replacing saturated fat with unsaturated fat is not the same as simply “lowering fat.”
- A single restaurant meal may contain most of a day’s sodium.
- Nutrition labels are clinical data.

G. Evidence Summary

The 2026 AHA and HHS dietary guidance emphasizes fruits and vegetables, whole grains, healthy protein sources, minimally processed foods, less added sugar, and lower sodium intake.

Dietary counseling should focus on the patient’s dominant sodium and saturated-fat sources rather than generic lists.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Diet and blood pressure	Sodium balance, potassium, vascular tone, and energy balance.

Slide 2: Diet and LDL	Saturated vs unsaturated fat; explain substitution.
Slide 3: Read the label	Work through sodium per serving and package.
Slide 4: Build a heart-healthy pattern	DASH/Mediterranean-compatible substitutions.
Slide 5: One-minute counseling plan	Two changes + follow-up + referral.

I. Assessment Package

Question 1. The frozen entrée contains 920 mg sodium per serving and 2 servings per package. If eaten entirely, how much sodium is consumed?

Answer: 1,840 mg.

Rationale: Nutrition-label numeracy is a practical clinical skill.

Question 2. Which substitution is most aligned with cardiovascular dietary guidance?

- A. Butter for olive/canola oil
- B. Olive/canola oil for butter
- C. Coconut oil for olive oil
- D. Processed meat for fish

Answer: B

Rationale: Replacing saturated fat sources with unsaturated fat sources is favored for cardiovascular risk reduction.

Question 3. Name two questions that make sodium counseling more actionable.

Answer: Examples: frequency of restaurant/takeout meals, packaged foods, deli meats, soups, sauces, snacks, cooking practices, budget, kitchen access.

Rationale: Identifies hidden sources and feasibility barriers.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
7	Minimally vs highly processed foods	Learner identifies packaged/restaurant sodium sources.
8	Nutrition labels	Learner calculates sodium from serving information.
11	Healthy dietary pattern	Learner constructs a heart-healthy pattern.
49	Translate dietary guidance	Learner converts AHA/DGA guidance into a clinical plan.

K. Required / Recommended Readings (see appendix for full citations)

- Lichtenstein AH, et al. 2026 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement from the American Heart Association. Circulation. 2026.

- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use culturally specific sodium sources such as sauces, pickles, seasoning blends, breads, or preserved foods.
- Add CKD if teaching contraindications to liberal potassium intake.
- Add statin counseling for an M2 pharmacology integration.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 2 label exercise + one substitution question.
30 minutes	Stages 1-3 + two counseling recommendations.
60 minutes	Full case, label exercise, and slide discussion.
120 minutes	Add team activity comparing three restaurant/packaged meals and role-play counseling.

N. Faculty Preparation Checklist

- Use current AHA guidance, not outdated “low-fat” messaging.
- Avoid implying that all ultraprocessed foods are nutritionally identical.
- Clarify potassium advice requires clinical context in CKD or medications that raise potassium.

3. Diarrhea, Fatigue, and a Missing Nutrient: Malabsorption in Context

Audience: Medical students (primarily M1-M2) | Primary curricular home: M1/M2 gastrointestinal block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Celiac disease, malabsorption, iron deficiency, and food intolerance
Nutrition trigger	Chronic diarrhea, weight loss, iron deficiency, and self-imposed dietary restriction
Primary learner task	Connect intestinal physiology to nutrition deficiencies and safe dietary counseling
HHS competencies	2, 3, 4, 20, 22, 27
Recommended assessment	Mechanism MCQ + deficiency identification + counseling

B. Learning Objectives

11. Explain how small-intestinal mucosal disease causes macro- and micronutrient malabsorption.
12. Differentiate celiac disease from nonimmune food intolerance at a conceptual level.
13. Identify iron deficiency as a possible extraintestinal clue to celiac disease.
14. Avoid recommending a gluten-free diet before diagnostic evaluation is complete.
15. Describe the role of an RDN after diagnosis.

C. Learner Case

Stage 1. A 28-year-old graduate student reports 8 months of intermittent diarrhea, bloating, fatigue, and a 4-kg unintentional weight loss. Hemoglobin is 10.8 g/dL, MCV 74 fL, ferritin 7 ng/mL.

- What nutritional abnormality is present?
- Which GI processes are required for normal iron absorption?

Stage 2. The patient reports that bread and pasta seem to worsen symptoms and has started avoiding gluten during the last week after reading online.

- Why could starting a gluten-free diet complicate evaluation?
- What additional nutritional deficiencies might be considered if malabsorption is prolonged?

Stage 3. Serologic testing is planned while the patient is still consuming gluten. The patient asks, “If this is celiac disease, can I just figure out the diet myself?”

- What is the physician’s role?
- What value does an RDN add?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Symptoms, weight change, stool features, diet restriction, anemia pattern, family history,

	supplements, and food access.
INTERPRET	Relate villous injury to impaired absorption and nutrient deficiency.
ACT	Complete appropriate diagnostic evaluation before long-term gluten restriction; correct deficiencies and initiate evidence-based diet after diagnosis.
COLLABORATE	RDN referral is central for a nutritionally adequate gluten-free diet, label reading, cross-contact education, and deficiency monitoring.

E. Facilitator Guide and Answer Key

Key reasoning points

- Iron deficiency can be the presenting clue to celiac disease even without dramatic diarrhea.
- Premature gluten avoidance can reduce the sensitivity of serologic and histologic testing.
- Long-term elimination diets can create nutritional gaps and require individualized education.

Common misconceptions to correct

- “Gluten intolerance” is not synonymous with celiac disease.
- A gluten-free label does not automatically mean a food is nutritionally superior.
- Testing is not simply a food elimination challenge when celiac disease is suspected.

Exemplar counseling language

- “Because the tests work best while you are still eating gluten, I would avoid making a permanent diet change until the diagnostic plan is complete. If celiac disease is confirmed, an RDN can help you make the diet both safe and nutritionally complete.”

F. Nutrition Clinical Pearls

- Nutrient deficiency can be a manifestation of GI disease.
- Elimination diets can obscure diagnosis and create deficiencies.
- Diagnosis and diet treatment should be coordinated.

G. Evidence Summary

Celiac disease is an immune-mediated enteropathy triggered by gluten in genetically susceptible individuals and can present with iron deficiency anemia, weight loss, diarrhea, or extraintestinal manifestations.

Dietary treatment is lifelong gluten avoidance after diagnosis, but nutritional adequacy, hidden sources, cross-contact, and micronutrient status require structured education.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Where nutrients are absorbed	Small-intestinal structure and high-yield absorption sites.
Slide 2: From villous injury to anemia	Mechanism linking mucosal disease to iron deficiency.

Slide 3: Celiac vs intolerance	Immune-mediated disease vs other food-related symptoms.
Slide 4: Do not treat before testing	Why premature restriction can compromise diagnosis.
Slide 5: Team-based care	Physician diagnosis + RDN dietary implementation + monitoring.

I. Assessment Package

Question 1. Which laboratory finding best confirms the nutritional deficiency already suggested by the CBC?

- A. High ferritin
- B. Low ferritin
- C. High B12
- D. High transferrin saturation

Answer: B

Rationale: Low ferritin supports iron deficiency in this context.

Question 2. Why should a patient with suspected celiac disease generally avoid starting a gluten-free diet before diagnostic testing is completed?

Answer: Reduced gluten exposure can diminish serologic and mucosal abnormalities and complicate diagnosis.

Rationale: Connects nutrition advice to diagnostic validity.

Question 3. List two tasks for which RDN involvement is particularly useful after diagnosis.

Answer: Examples: label reading, avoiding cross-contact, ensuring fiber and micronutrient adequacy, meal planning, culturally appropriate substitutions, monitoring nutritional intake.

Rationale: Assesses interprofessional role recognition.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
2	Pathological states affecting nutrient absorption	Learner connects mucosal disease to malabsorption.
3	Identify nutrient deficiencies	Learner recognizes iron deficiency and considers additional deficits.
4	Food allergy/intolerance differentiation	Learner distinguishes immune-mediated celiac disease from intolerance concepts.
22	Nutrition assessment	Learner evaluates weight change, dietary restriction, and labs.

K. Required / Recommended Readings (see appendix for full citations)

- American College of Gastroenterology. Clinical Guideline: Diagnosis and Management of Celiac Disease. 2023.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Swap celiac disease for pancreatic insufficiency or inflammatory bowel disease if that better fits the local block.
- Add folate/B12/vitamin D results for advanced learners.
- Use a culturally specific diet and ask students to identify gluten-containing staples and alternatives.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Use Stage 1 and ask mechanism + iron-deficiency question.
30 minutes	Add Stage 2 diagnostic pitfall.
60 minutes	Full case + five slides + assessment.
120 minutes	Add food-label exercise, cross-contact scenario, and RDN role-play.

N. Faculty Preparation Checklist

- Do not teach empiric gluten avoidance as a diagnostic test for celiac disease.
- Ensure the case distinguishes medical diagnosis from wellness trends.
- Have local referral information for GI and RDN services if used clinically.

4. There Is No “Diabetic Diet”: Individualizing Nutrition in Type 2 Diabetes

Audience: Medical students (primarily M1-M2) | Primary curricular home: M2 endocrine block |

Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	New type 2 diabetes, carbohydrate quality, dietary patterns, and medical nutrition therapy
Nutrition trigger	Patient requests a rigid list of foods to avoid
Primary learner task	Integrate glycemic physiology with individualized nutrition care
HHS competencies	1, 8, 11, 22, 30, 40, 57
Recommended assessment	Meal analysis + guideline application + referral decision

B. Learning Objectives

16. Explain why glycemic response depends on amount, quality, preparation, and context of carbohydrate intake.
17. Identify high-yield dietary targets in type 2 diabetes without creating a forbidden-food list.
18. Compare several evidence-supported dietary patterns for diabetes.
19. Explain the role of individualized medical nutrition therapy delivered by an RDN.
20. Provide a culturally responsive counseling message.

C. Learner Case

Stage 1. A 51-year-old patient is newly diagnosed with type 2 diabetes (A1c 7.6%). The patient asks for “the diabetic diet” and says, “Just tell me what foods I can never eat again.”

- What assumptions in the question should be addressed?
- What additional history is needed?

Stage 2. Typical dinner is white rice, lentil curry, vegetables, yogurt, and occasionally sweets. The patient drinks sweetened tea twice daily and rarely exercises after meals.

- Which components could be preserved?
- Which modifications might reduce glycemic burden without removing cultural foods?

Stage 3. The patient is willing to change one beverage and one dinner habit but does not want carbohydrate counting.

- Create a simple plan.
- When should the patient be referred to an RDN?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Usual meals, beverages, portions, meal timing, food preferences, literacy, medication plan,

	hypoglycemia risk, finances.
INTERPRET	Glycemic response reflects carbohydrate amount and quality, fiber, mixed meals, medications, activity, and individual variability.
ACT	Choose a sustainable pattern: reduce sweetened beverages, increase nonstarchy vegetables/fiber, adjust portions, pair carbohydrate with protein/fat/fiber, consider post-meal activity.
COLLABORATE	RDN referral for individualized MNT is recommended for people with diabetes.

E. Facilitator Guide and Answer Key

Key reasoning points

- There is no single universal “diabetic diet.”
- Whole dietary patterns and practical tools are preferred over rigid macronutrient rules.
- Medication regimen matters: nutrition counseling must account for hypoglycemia risk when insulin or insulin secretagogues are used.

Common misconceptions to correct

- Fruit does not need to be universally prohibited.
- Rice, bread, tortillas, or other staples do not need to be eliminated.
- “Sugar-free” foods are not automatically healthier.

Exemplar counseling language

- “You do not need a separate ‘diabetic diet.’ We can keep the foods that matter to you and adjust the portions, beverages, and balance of the meal to improve glucose while making the plan realistic.”

F. Nutrition Clinical Pearls

- Individualization is a core diabetes nutrition principle.
- Food quality and total energy matter alongside carbohydrate exposure.
- RDN-provided MNT is part of diabetes treatment, not an optional add-on.

G. Evidence Summary

ADA 2026 guidance states that no single eating pattern or fixed macronutrient distribution is appropriate for everyone with diabetes. Plans should be individualized to metabolic goals, preferences, culture, literacy, and access.

Dietary patterns emphasizing nonstarchy vegetables, whole fruits, legumes, lean proteins, whole grains, nuts/seeds, and minimally processed foods can support glycemic and cardiometabolic goals.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Why glucose rises after meals	Carbohydrate digestion, absorption, insulin response, and mixed-meal effects.
Slide 2: No single diabetic diet	Individualized eating patterns and patient goals.

Slide 3: Keep the culture, change the pattern	Examples of portion, fiber, beverage, and pairing modifications.
Slide 4: Medication matters	When meals interact with hypoglycemia risk.
Slide 5: Clinical plan	One beverage change + one plate change + RDN referral.

I. Assessment Package

Question 1. Which statement best reflects current diabetes nutrition guidance?

- A. All patients should use the same carbohydrate percentage
- B. A single Mediterranean diet is required
- C. Eating plans should be individualized to goals, preferences, and context
- D. Fruit should be avoided

Answer: C

Rationale: Current guidance emphasizes individualized MNT and multiple acceptable dietary patterns.

Question 2. Give two ways to modify the described dinner without eliminating rice.

Answer: Examples: smaller rice portion; increase lentils/vegetables; use a higher-fiber grain when acceptable; pair with protein/fiber; reduce sweets; post-meal walk.

Rationale: Assesses practical cultural tailoring.

Question 3. Who should provide individualized diabetes medical nutrition therapy when available?

Answer: A registered dietitian nutritionist with diabetes expertise.

Rationale: Tests interprofessional role knowledge.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
11	Healthy dietary patterns	Learner compares acceptable patterns.
22	Nutrition assessment	Learner gathers diet/medication/context history.
30	Evidence-based care	Learner translates guidance to a meal plan.
40	Appropriate referral	Learner identifies RDN MNT role.

K. Required / Recommended Readings (see appendix for full citations)

- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Change the staple food to match local demographics.
- Add insulin/sulfonylurea use for a pharmacology version.
- Add CGM traces for an optional precision-monitoring extension.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Patient question + one meal modification exercise.
30 minutes	Stages 1-3 + referral discussion.
60 minutes	Full case and five-slide teaching deck.
120 minutes	Add meal photo analysis, counseling role-play, and optional CGM extension.

N. Faculty Preparation Checklist

- Avoid “good” and “bad” food language.
- Separate individualized nutrition counseling from medication prescribing decisions.
- Review local diabetes education and RDN referral mechanisms.

5. Potassium Is High: When “Eat More Fruits and Vegetables” Needs

Context

Audience: Medical students (primarily M1-M2) | Primary curricular home: M2 renal block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	CKD, potassium, sodium, protein, and individualized dietary restriction
Nutrition trigger	Generic healthy-eating advice conflicts with CKD-specific risk
Primary learner task	Balance general nutrition guidance with kidney disease physiology
HHS competencies	3, 6, 11, 22, 30, 39, 40
Recommended assessment	Electrolyte reasoning + diet history + referral

B. Learning Objectives

21. Explain major determinants of serum potassium in CKD.
22. Recognize that hyperkalemia management should not begin with indiscriminate restriction of all fruits and vegetables.
23. Describe the role of sodium and protein guidance in CKD.
24. Identify medication and non-dietary contributors to hyperkalemia.
25. Recognize the value of renal RDN co-management.

C. Learner Case

Stage 1. A 67-year-old with CKD stage G3b has potassium 5.6 mmol/L. Medications include lisinopril. The patient was recently told to “eat healthier” and now drinks a large fruit-and-vegetable smoothie every morning.

- What are the major contributors to hyperkalemia in CKD?
- What details of the smoothie and overall diet matter?

Stage 2. The smoothie contains orange juice, banana, spinach, and a potassium-containing salt substitute. The patient also has mild constipation.

- Which factors are modifiable?
- Why might a blanket instruction to avoid all produce be problematic?

Stage 3. The patient asks for a list of “foods I can never eat again.”

- How would you individualize the response?
- Why should a renal RDN be involved?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Kidney function trend, medications,

	supplements/salt substitutes, constipation, metabolic acidosis, potassium sources, sodium, protein, overall diet.
INTERPRET	Serum potassium reflects kidney excretion, medications, acid-base status, GI handling, and dietary bioavailability—not food potassium alone.
ACT	Remove concentrated or hidden potassium sources when appropriate, address non-dietary contributors, moderate sodium, and avoid unnecessary overrestriction.
COLLABORATE	Renal RDN input helps preserve dietary quality while meeting potassium, sodium, protein, and energy needs.

E. Facilitator Guide and Answer Key

Key reasoning points

- Potassium-containing salt substitutes are an important hidden source.
- Processed foods may contain highly bioavailable potassium additives; whole-food potassium guidance should be individualized.
- CKD guidance emphasizes healthy dietary patterns, sodium reduction, appropriate protein intake, and dietitian involvement.

Common misconceptions to correct

- All fruits and vegetables are not automatically unsafe in CKD.
- Dietary potassium is only one contributor to hyperkalemia.
- Low-protein diets should not be improvised without attention to nutritional status and disease stage.

Exemplar counseling language

- “Your potassium is affected by your kidneys, medicines, bowel function, and diet. Instead of banning produce, we should identify the concentrated sources and build a plan that keeps your diet nutritious.”

F. Nutrition Clinical Pearls

- Renal nutrition is an archetype of why generic dietary rules can be unsafe.
- Salt substitutes deserve explicit medication/diet history questions.
- Overrestriction can worsen diet quality and nutritional status.

G. Evidence Summary

KDIGO 2024 emphasizes healthy, diverse diets, sodium reduction, appropriate protein intake, and individualized management in CKD. Hyperkalemia care should consider medications, acid-base status, bowel function, and dietary sources.

Renal RDN involvement is especially useful when multiple nutrient targets conflict.

H. Five-Slide Teaching Deck

Slide	Suggested content
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Slide 1: Why potassium rises	Renal excretion + medications + acid-base/GI factors.
Slide 2: Find the hidden sources	Salt substitutes, juices, additives, concentrated foods.
Slide 3: Do not ban the produce aisle	Individualize restriction and preserve dietary quality.
Slide 4: CKD diet beyond potassium	Sodium, protein, energy, and malnutrition risk.
Slide 5: Team plan	Physician medication/etiology review + renal RDN diet plan.

I. Assessment Package

Question 1. Which item in the history is a particularly important hidden potassium source?

Answer: The potassium-containing salt substitute.

Rationale: Salt substitutes can provide substantial potassium and are easily missed.

Question 2. Name two non-dietary contributors to hyperkalemia to assess.

Answer: Examples: RAAS-inhibiting medications, metabolic acidosis, constipation, worsening kidney function, diabetes/insulin deficiency, tissue breakdown.

Rationale: Prevents reduction of hyperkalemia to diet alone.

Question 3. Why is indiscriminate avoidance of fruits and vegetables undesirable?

Answer: It can unnecessarily reduce fiber, micronutrients, and overall diet quality; potassium restriction should be individualized to clinical risk and specific sources.

Rationale: Tests nuanced dietary reasoning.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
6	Drug-nutrient interactions	Learner connects RAAS blockade and potassium exposure.
22	Nutrition assessment	Learner identifies salt substitute and concentrated sources.
30	Evidence-based nutrition care	Learner balances healthy pattern with CKD constraints.
39	Interprofessional care	Learner defines renal RDN role.

K. Required / Recommended Readings (see appendix for full citations)

- KDIGO. 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney International. 2024.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- For early M1 physiology, remove medication complexity and focus on renal potassium handling.
- For advanced learners, add metabolic acidosis, potassium binder therapy, or dialysis.
- Use locally common high-potassium foods rather than a generic list.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 2 hidden-source identification.
30 minutes	Stages 1-3 + non-dietary contributors.
60 minutes	Full case + slides + assessment.
120 minutes	Add food-label additive exercise and simulated RDN consult plan.

N. Faculty Preparation Checklist

- Review current local hyperkalemia protocols.
- Avoid providing rigid potassium food lists without clinical context.
- Emphasize that CKD nutritional targets change with stage, comorbidity, and malnutrition risk.

6. Iron Deficiency Is a Nutrition Problem—Until It Is Not

Audience: Medical students (primarily M1-M2) | Primary curricular home: M1/M2 hematology block |
Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Iron deficiency, food sources, absorption, supplementation, and diagnostic reasoning
Nutrition trigger	Low iron intake coexists with a potential source of blood loss
Primary learner task	Teach nutrient biology without allowing dietary explanations to replace medical evaluation
HHS competencies	3, 20, 22, 27, 30
Recommended assessment	Deficiency mechanism + food pairing + diagnostic safety

B. Learning Objectives

26. Explain heme and non-heme iron sources and major factors that alter absorption.
27. Interpret ferritin and transferrin saturation in uncomplicated iron deficiency.
28. Recommend food strategies that improve iron intake and absorption.
29. Recognize when iron deficiency requires evaluation for blood loss or disease rather than dietary counseling alone.
30. Explain when supplementation and RDN involvement may be useful.

C. Learner Case

Stage 1. A 46-year-old patient reports fatigue and pica. Hemoglobin is 9.9 g/dL, MCV 70 fL, ferritin 5 ng/mL. The patient follows a mostly plant-based diet.

- What deficiency is present?
- Which dietary history questions are relevant?

Stage 2. The patient eats legumes frequently but drinks tea with most meals and rarely consumes vitamin C-rich foods. Menstrual periods are heavy.

- How could meal composition affect non-heme iron absorption?
- Why is the menstrual history more important than simply labeling this a “diet problem”?

Stage 3. The patient asks whether spinach alone can “fix the anemia.”

- How would you discuss food, supplementation, and diagnostic evaluation?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Dietary iron sources, inhibitors/enhancers, blood loss, GI symptoms, medications, pregnancy status, supplements.

INTERPRET	Non-heme iron absorption is influenced by meal context; iron deficiency still requires evaluation for its cause.
ACT	Increase iron-rich foods and pair plant iron with vitamin C; use supplementation when clinically indicated; investigate blood loss.
COLLABORATE	RDN input helps optimize plant-based dietary adequacy; gynecology/GI evaluation may be needed depending on cause.

E. Facilitator Guide and Answer Key

Key reasoning points

- Plant-based diets can meet iron needs, but non-heme iron has lower and more variable bioavailability.
- Vitamin C can enhance non-heme iron absorption; tea/coffee around meals can reduce absorption.
- Dietary counseling does not replace evaluation for abnormal uterine bleeding or GI blood loss.

Common misconceptions to correct

- Spinach is not a stand-alone treatment for clinically significant iron-deficiency anemia.
- A vegetarian diet does not automatically cause iron deficiency.
- Iron supplementation is not appropriate indefinitely without identifying the cause.

Exemplar counseling language

- “We can improve the iron you absorb from food, but your degree of deficiency also deserves an evaluation for why iron is being lost. We should do both at the same time.”

F. Nutrition Clinical Pearls

- Nutrition deficiencies often reveal underlying disease.
- Bioavailability is clinically important, not just nutrient content.
- Food-based advice and diagnostic evaluation are complementary.

G. Evidence Summary

Iron deficiency may arise from inadequate intake, reduced absorption, increased requirements, or blood loss. Clinical reasoning should identify the cause while replenishing iron.

For plant-based diets, iron-rich legumes, fortified foods, nuts/seeds, and greens can contribute; pairing with vitamin C-rich foods and separating tea/coffee from iron-rich meals can improve absorption.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Iron biology	Heme vs non-heme iron and absorption.
Slide 2: Read the labs	Ferritin, MCV, and transferrin saturation.
Slide 3: Food bioavailability	Vitamin C, tea/coffee, phytates, meal context.
Slide 4: Do not miss the cause	Blood loss and malabsorption evaluation.
Slide 5: Clinical plan	Food strategy + supplementation + diagnostic

	follow-up.
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I. Assessment Package

Question 1. Which dietary change could improve absorption of non-heme iron?

- A. Drink tea with the meal
- B. Pair lentils with a vitamin C-rich food
- C. Avoid all legumes
- D. Take calcium with every iron-rich meal

Answer: B

Rationale: Vitamin C enhances non-heme iron absorption.

Question 2. What feature makes it unsafe to attribute the anemia solely to diet?

Answer: Heavy menstrual bleeding (and, depending on patient characteristics, other potential sources of blood loss).

Rationale: Nutritional diagnosis must not replace etiologic evaluation.

Question 3. Give one plant-based iron source and one absorption-enhancing pairing.

Answer: Example: lentils + bell peppers/citrus/tomatoes.

Rationale: Tests practical translation of bioavailability.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
3	Identify nutrient deficiencies	Learner recognizes iron deficiency and treatment options.
20	Food bioavailability and synergies	Learner applies vitamin C and inhibitor concepts.
22	Nutrition assessment	Learner integrates dietary intake with bleeding history.
30	Clinical integration	Learner combines food strategy with diagnostic workup.

K. Required / Recommended Readings

- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- NIH Office of Dietary Supplements. Iron: Fact Sheet for Health Professionals.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use pregnancy, endurance athletics, or bariatric surgery as alternate causes depending on the block.
- Use a plant-based case to teach adequacy without stigmatizing vegetarian eating.
- Add PPI or celiac disease for advanced absorption discussion.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 1 + one bioavailability question.
30 minutes	Stages 1-2 + diagnostic safety discussion.
60 minutes	Full case + teaching deck.
120 minutes	Add lab interpretation stations, meal-pairing exercise, and counseling role-play.

N. Faculty Preparation Checklist

- Ensure local diagnostic standards are followed for iron-deficiency evaluation.
- Avoid implying that diet alone explains severe anemia.
- Emphasize that plant-based dietary patterns can be nutritionally adequate when planned.

7. The Older Adult Losing Strength: Protein, Bone, and Sarcopenia

Audience: Medical students (primarily M1-M2) | Primary curricular home: M2 musculoskeletal/geriatrics block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Sarcopenia, osteoporosis risk, protein distribution, calcium/vitamin D, and energy adequacy
Nutrition trigger	Unintentional weight loss and low protein intake in an older adult
Primary learner task	Integrate muscle and bone physiology with practical nutrition assessment
HHS competencies	3, 5, 11, 22, 24, 30, 32
Recommended assessment	Nutrition-risk identification + meal redesign + referral

B. Learning Objectives

31. Recognize unintentional weight loss and reduced intake as nutritional risk in older adults.
32. Explain how inadequate energy and protein intake contribute to loss of muscle mass and function.
33. Identify calcium and vitamin D as relevant to bone health while avoiding supplement-only thinking.
34. Propose a food-first strategy that distributes protein across meals.
35. Recognize when RDN and physical therapy involvement are appropriate.

C. Learner Case

Stage 1. A 79-year-old living alone reports reduced appetite and two falls in the past year. Weight has declined 5 kg over 6 months. Breakfast is toast and coffee; lunch is soup; dinner is often cereal.

- What findings suggest nutritional risk?
- What additional functional and social questions should you ask?

Stage 2. The patient has difficulty shopping, poor dentition, and says meat “feels too hard to chew.” Vitamin D is low-normal; kidney function is normal.

- How would you increase protein without insisting on meat?
- What calcium- and vitamin D-containing foods could fit?

Stage 3. The patient asks whether a protein powder is enough to prevent falls.

- What else matters besides protein?
- Which professionals should be involved?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Weight trajectory, appetite, chewing/swallowing, meal frequency, protein sources, calcium/vitamin D, food access, function, falls.

INTERPRET	Low energy/protein intake and inactivity can accelerate sarcopenia; bone health and fall risk are multifactorial.
ACT	Increase energy and protein density using acceptable foods, distribute protein across meals, address calcium/vitamin D adequacy, and pair nutrition with resistance/functional exercise when safe.
COLLABORATE	RDN for individualized intake plan; PT/OT, dentistry, social work, and primary care depending on barriers.

E. Facilitator Guide and Answer Key

Key reasoning points

- Unintentional weight loss in older adults is clinically important even when BMI remains “normal.”
- Protein quality and total intake matter, but total energy adequacy and resistance activity are also critical.
- Soft, affordable protein sources include yogurt, eggs, tofu, legumes, milk/fortified alternatives, fish, nut butters, and cottage cheese depending on preferences.

Common misconceptions to correct

- Protein powder alone does not treat sarcopenia.
- Weight loss is not always desirable in older adults.
- Calcium and vitamin D supplements do not replace broader nutrition and fall-risk assessment.

Exemplar counseling language

- “The goal is not just more protein; it is enough food overall, protein spread through the day, and keeping your muscles active. We can choose foods that are easy for you to chew and afford.”

F. Nutrition Clinical Pearls

- Weight trajectory is a vital sign in geriatric nutrition.
- Sarcopenia care is nutrition plus activity plus barrier removal.
- Meal feasibility often matters more than an idealized nutrient target.

G. Evidence Summary

Older adults are vulnerable to inadequate energy and protein intake because of appetite changes, social isolation, dental disease, functional limitations, and illness.

A food-first plan should be individualized and coupled with resistance/functional activity when appropriate; supplementation is adjunctive rather than the entire strategy.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: What is sarcopenia?	Muscle mass, strength, function, and aging physiology.
Slide 2: Spot nutritional risk	Weight loss, intake, chewing, function, social

	context.
Slide 3: Protein without a “meat prescription”	Flexible food sources and distribution.
Slide 4: Bone health in context	Calcium, vitamin D, exercise, and falls.
Slide 5: Interprofessional plan	RDN + PT/OT + dentistry/social support as needed.

I. Assessment Package

Question 1. Which finding is the strongest immediate nutritional red flag?

Answer: Unintentional 5-kg weight loss over 6 months with reduced intake.

Rationale: Weight loss and low intake indicate malnutrition risk regardless of BMI.

Question 2. Name two soft high-protein foods that could fit this patient’s chewing limitations.

Answer: Examples: yogurt, eggs, tofu, legumes, cottage cheese, milk/fortified soy milk, nut butter.

Rationale: Tests practical flexibility.

Question 3. Why is protein powder alone insufficient?

Answer: Sarcopenia and fall risk also depend on total energy intake, resistance/functional activity, comorbid disease, vitamin/mineral status, and functional/social barriers.

Rationale: Encourages systems thinking.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
5	Requirements across lifespan	Learner applies older-adult nutritional needs.
22	Nutrition assessment	Learner evaluates weight, intake, function, and barriers.
24	Malnutrition risk	Learner recognizes weight loss/low intake.
30	Clinical integration	Learner builds a combined nutrition/function plan.

K. Required / Recommended Readings (see appendix for full citations)

- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- ESPEN practical guidance on clinical nutrition and hydration in geriatrics (current edition).
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use a vegetarian, culturally specific, or food-insecure patient to broaden protein-source reasoning.
- Add osteoporosis pharmacotherapy for advanced M2 integration.
- Add dysphagia if linking to neurology or inpatient care.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 1 risk identification + one meal redesign.
30 minutes	Stages 1-2 + interprofessional plan.
60 minutes	Full case and slides.
120 minutes	Add mini malnutrition screen, meal-building exercise, and counseling simulation.

N. Faculty Preparation Checklist

- Avoid weight-centric counseling that assumes weight loss is beneficial in older adults.
- Do not prescribe supplements without considering total intake and barriers.
- Have local malnutrition screening/referral tools available.

8. Normal Liver Tests Do Not Mean Normal Metabolism: Obesity and MASLD

Audience: Medical students (primarily M1-M2) | Primary curricular home: M2 multisystem/endocrine/GI block | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Obesity, MASLD, dietary patterns, weight loss, and cardiometabolic risk
Nutrition trigger	Incidental hepatic steatosis in a patient focused on “detox” diets
Primary learner task	Link visceral/ectopic fat biology with evidence-based nutrition and avoid fad-diet framing
HHS competencies	7, 11, 22, 30, 49, 57, 60
Recommended assessment	Risk interpretation + fad-diet counseling + treatment plan

B. Learning Objectives

36. Explain how insulin resistance and ectopic fat contribute to MASLD.
37. Recognize MASLD as a cardiometabolic condition requiring fibrosis risk assessment and CVD risk management.
38. Recommend evidence-based dietary and activity changes without endorsing detox regimens.
39. Explain the relationship between weight loss and liver improvement while acknowledging lean MASLD.
40. Recognize the role of RDN and longitudinal monitoring.

C. Learner Case

Stage 1. A 44-year-old patient with BMI 33 kg/m², triglycerides 240 mg/dL, A1c 6.2%, and mildly elevated ALT has hepatic steatosis on ultrasound. The patient feels well and asks whether a 7-day juice cleanse will “detox the liver.”

- What metabolic processes likely underlie the steatosis?
- What else should be assessed besides ALT?

Stage 2. Dietary history shows frequent sweetened beverages, restaurant meals, low fiber intake, and minimal physical activity. Alcohol intake is low.

- What are the highest-yield changes?
- What is the problem with a juice-only cleanse?

Stage 3. The patient says, “If I lose 10 pounds quickly, is the liver fixed?”

- How would you discuss sustained weight loss and metabolic risk?
- What monitoring and referrals are appropriate?

D. Four Core Nutrition Questions

Domain	Prompt
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ASSESS	Weight trajectory, waist/visceral risk, diabetes/lipids/BP, alcohol, dietary pattern, activity, medications, fibrosis risk.
INTERPRET	Insulin resistance, energy surplus, de novo lipogenesis, and adipose dysfunction contribute to ectopic hepatic fat; fibrosis drives liver-related risk.
ACT	Use a sustainable hypocaloric pattern when weight loss is indicated, emphasize minimally processed foods and fiber, reduce sugar-sweetened beverages, increase activity, and manage cardiometabolic risk.
COLLABORATE	RDN for individualized MNT; hepatology/endocrinology/obesity care depending on fibrosis and treatment needs.

E. Facilitator Guide and Answer Key

Key reasoning points

- MASLD management is not a “liver detox.”
- Fibrosis risk stratification is more important prognostically than steatosis alone.
- Mediterranean-style dietary patterns, physical activity, and sustained weight loss when indicated are core treatments.

Common misconceptions to correct

- Normal or mildly elevated ALT does not exclude clinically important MASLD.
- Rapid cleanses are not evidence-based treatment.
- MASLD can occur without obesity, so weight alone is not the disease definition.

Exemplar counseling language

- “Your liver does not need a cleanse. The strongest evidence is for sustained changes that improve insulin resistance and overall cardiometabolic health, while we also assess whether there is any liver fibrosis.”

F. Nutrition Clinical Pearls

- Think of MASLD as a metabolic and cardiovascular disease as well as a liver disease.
- Sustained dietary pattern change matters more than detox products.
- Fibrosis risk stratification should accompany lifestyle treatment.

G. Evidence Summary

The 2026 AGA MASLD pathway emphasizes fibrosis risk stratification and treatment of lifestyle and cardiometabolic risk. Mediterranean-style dietary patterns, regular physical activity, and sustained weight loss when appropriate can improve liver and metabolic outcomes.

Management should include diabetes, lipid, blood pressure, obesity, and cardiovascular risk treatment rather than focusing exclusively on liver enzymes.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Why fat accumulates in liver	Adipose dysfunction, insulin resistance, de novo lipogenesis.
Slide 2: Steatosis vs fibrosis	Why fibrosis changes prognosis.
Slide 3: What diet evidence supports	Sustainable patterns, energy balance, fiber, fewer sugary beverages.
Slide 4: Detox myth	Why cleanses do not treat MASLD.
Slide 5: Clinical plan	Lifestyle + fibrosis risk + cardiometabolic treatment + follow-up.

I. Assessment Package

Question 1. Which is the most evidence-aligned initial nutrition strategy?

- A. Seven-day juice cleanse
- B. Sustainable calorie reduction when indicated with a Mediterranean-style or other high-quality dietary pattern
- C. Avoid all dietary fat
- D. Use supplements instead of dietary change

Answer: B

Rationale: Sustainable dietary patterns and weight loss when indicated are supported; detox regimens are not.

Question 2. What feature most strongly predicts liver-related outcomes in MASLD?

Answer: Fibrosis severity.

Rationale: Risk stratification should not stop at detection of steatosis.

Question 3. Name two cardiometabolic issues that should be managed alongside liver disease.

Answer: Examples: diabetes/prediabetes, dyslipidemia, hypertension, obesity, cardiovascular risk.

Rationale: MASLD management is multisystem.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
7	Minimally vs highly processed foods	Learner identifies sugary beverages and restaurant/processed patterns.
22	Nutrition assessment	Learner evaluates diet, alcohol, weight, activity, and metabolic risk.
30	Evidence-based care	Learner rejects detox framing and proposes sustained

		treatment.
60	Food-based chronic disease approaches	Learner integrates nutrition with cardiometabolic care.

K. Required / Recommended Readings

- American Gastroenterological Association. Clinical Care Pathway for Risk Stratification and Management of Patients with MASLD. 2026.
- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- For lean MASLD, use BMI below obesity range and focus on visceral adiposity/metabolic risk.
- Add FIB-4 calculation for M2 or clerkship learners.
- Add GLP-1 therapy as a bridge to the resident version.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 1 + detox counseling question.
30 minutes	Add diet history and two targeted changes.
60 minutes	Full case + fibrosis teaching.
120 minutes	Add FIB-4 exercise, counseling role-play, and dietary pattern comparison.

N. Faculty Preparation Checklist

- Use current MASLD nomenclature and local fibrosis pathways.
- Do not imply that all MASLD requires weight loss.
- Keep supplement discussion evidence-based and avoid unproven “liver detox” products.

SET B: INTERNAL MEDICINE RESIDENT CASES

Designed for ambulatory conference, inpatient noon conference, academic half-day, continuity clinic teaching, or elective curricula. These cases assume core medical knowledge and emphasize management complexity.

1. GLP-1 Success, Nutrition Failure? Weight Loss, Protein Adequacy, and Lean-Mass Risk

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Ambulatory IM, obesity medicine, endocrine, or continuity clinic | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Type 2 diabetes/obesity on GLP-1 therapy with rapid weight loss and low intake
Nutrition trigger	Medication-associated appetite suppression creates inadequate protein/energy intake and possible lean-mass loss
Primary learner task	Balance therapeutic weight loss with nutrition adequacy, functional outcomes, and medication monitoring
HHS competencies	3, 5, 6, 22, 24, 30, 39, 40, 55, 59
Recommended assessment	Management plan + medication/nutrition interaction + referral

B. Learning Objectives

41. Recognize clinical clues to inadequate intake during anti-obesity pharmacotherapy.
42. Assess protein, energy, hydration, micronutrient, and GI-tolerance issues without prescribing a single rigid protein target to all patients.
43. Integrate resistance activity and functional monitoring into obesity treatment.
44. Identify medication safety issues when intake falls rapidly, including diabetes and antihypertensive therapy.
45. Define when RDN co-management or medication adjustment is appropriate.

C. Learner Case

Stage 1. A 61-year-old with type 2 diabetes and obesity has lost 14% of body weight over 5 months after starting a GLP-1-based obesity medication. A1c improved from 8.1% to 6.5%. The patient reports early satiety, fatigue, constipation, and “mostly coffee and a protein shake until dinner.”

- What is successful here, and what is concerning?
- What nutritional and functional history should be added to the routine medication follow-up?

Stage 2. The patient has reduced chair-rise strength, eats little breakfast/lunch protein, drinks <1 L fluid/day, and takes basal insulin plus two antihypertensives. Home BP is now 102-108/64-68 mm Hg.

- Which problems require action today?
- How could reduced intake interact with current medications?

Stage 3. The patient wants to increase the GLP-1 dose because “faster weight loss is better.”

- How would you frame benefits vs risks?
- Build a multidisciplinary plan including nutrition, resistance activity, medication review, and follow-up metrics.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Weight-loss rate, dietary intake, protein distribution, hydration, GI symptoms, strength/function, micronutrient risk, hypoglycemia, blood pressure, medications.
INTERPRET	Weight loss improves metabolic risk but appetite suppression can reduce nutrient intake; rapid loss and inactivity may contribute to lean-mass decline and orthostasis/hypoglycemia.
ACT	Stabilize intake, treat GI barriers, individualize protein/energy goals, add resistance training as appropriate, and reassess insulin/BP medications.
COLLABORATE	RDN for nutrition plan; pharmacist/diabetes educator/PT as appropriate; consider obesity specialist if tolerability or dosing is problematic.

E. Facilitator Guide and Answer Key

Key reasoning points

- Successful pharmacologic weight loss still requires nutrition surveillance.
- The relevant outcome is not simply scale weight; function, glycemia, BP, hydration, intake, and tolerability matter.
- Medication de-intensification may be necessary as weight and intake change.

Common pitfalls

- Escalating medication despite poor intake and functional decline.
- Giving a generic high-protein prescription without considering CKD, preferences, total energy, or GI tolerance.
- Ignoring constipation, dehydration, orthostatic symptoms, or hypoglycemia risk.

Exemplar plan

- Pause dose escalation; obtain focused diet/functional assessment; treat GI symptoms; establish feasible protein-containing meals/snacks and hydration; initiate resistance exercise if safe; review insulin and antihypertensives; RDN follow-up within weeks.

F. Nutrition Clinical Pearls

- Weight loss is a treatment process requiring longitudinal nutritional reassessment.
- GLP-1-related appetite reduction can convert an “obesity visit” into a malnutrition-risk visit.
- Nutrition and deprescribing are often linked.

G. Evidence Summary

ADA 2026 obesity and nutrition guidance supports combining pharmacologic obesity treatment with nutrition, physical activity, and behavioral therapy. Individualization is central.

As intake and body weight change, medication needs and adverse-effect risks can change; clinicians should reassess diabetes and blood-pressure therapies rather than treating weight as an isolated outcome.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Success vs overtreatment	Weight loss, glycemic benefit, and signs of inadequate intake.
Slide 2: Focused nutrition assessment	Protein distribution, energy, hydration, GI symptoms, function.
Slide 3: Medication-nutrition interactions	Hypoglycemia, hypotension, constipation/dehydration.
Slide 4: Protect function	Resistance activity + adequate intake + individualized targets.
Slide 5: Follow-up dashboard	Weight trajectory, BP, glycemia, strength, intake, symptoms.

I. Assessment Package

Question 1. What is the highest-priority next step?

- A. Increase GLP-1 dose immediately
- B. Reassess nutritional intake, symptoms, function, and medication needs before dose escalation
- C. Stop all carbohydrates
- D. Add another appetite suppressant

Answer: B

Rationale: The patient has signs of inadequate intake and possible medication overtreatment despite metabolic benefit.

Question 2. Which medications deserve prompt reassessment in light of lower intake and BP?

Answer: Basal insulin and antihypertensives, individualized to glucose and blood-pressure data.

Rationale: Nutrition changes can alter medication safety requirements.

Question 3. List four follow-up metrics beyond body weight.

Answer: Examples: protein/energy intake, hydration, GI symptoms, strength/function, BP/orthostasis, glucose/hypoglycemia, micronutrient risk.

Rationale: Encourages multidimensional obesity care.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
6	Drug-nutrient interactions	Learner links reduced intake to insulin/BP medication risk.

24	Malnutrition risk	Learner recognizes functional decline and low intake.
55	GLP-1 plus diet/lifestyle counseling	Learner integrates nutrition into pharmacotherapy.
59	Medication-nutrition synergy	Learner coordinates pharmacologic and lifestyle treatment.

K. Required / Recommended Readings

- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- Current prescribing information for the GLP-1-based therapy used locally.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use a patient with CKD to force protein-target individualization.
- Use a frail older adult to heighten function and sarcopenia concerns.
- Convert to a discharge case after hospitalization for dehydration or orthostasis.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 2 medication-nutrition interaction huddle.
30 minutes	Stages 1-3 with prioritized problem list.
60 minutes	Full case + management plan + teaching slides.
120 minutes	Add medication reconciliation, diet recall, strength assessment, and simulated RDN/pharmacist handoff.

N. Faculty Preparation Checklist

- Use current drug labeling and local protocols.
- Avoid unsupported universal protein prescriptions.
- Frame weight loss as one outcome among metabolic health, function, tolerability, and quality of life.

2. Resistant Hypertension or Resistant Diet? Sodium, Lipids, CKD, and Real-World Food Exposure

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Ambulatory IM or cardiology/renal conference | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Hypertension and dyslipidemia with early CKD and high restaurant sodium exposure
Nutrition trigger	Apparent medication-resistant BP is compounded by high sodium intake and misinformation about fats
Primary learner task	Use targeted nutrition history as part of resistant-hypertension evaluation
HHS competencies	6, 7, 8, 11, 22, 30, 39, 49
Recommended assessment	Problem prioritization + label/restaurant analysis + medication-diet plan

B. Learning Objectives

46. Incorporate dietary sodium and alcohol assessment into evaluation of difficult-to-control hypertension.
47. Counsel on unsaturated-for-saturated fat substitution in a patient with high LDL-C.
48. Balance potassium-rich dietary advice with CKD and medication context.
49. Use label/menu information to identify actionable exposures.
50. Coordinate medication and nutrition management rather than treating them as separate domains.

C. Learner Case

Stage 1. A 59-year-old with hypertension, LDL-C 178 mg/dL, eGFR 48 mL/min/1.73m², and obesity has clinic BP 156/92 mm Hg despite amlodipine, losartan, and chlorthalidone. The resident is asked whether a fourth agent is needed.

- What should be confirmed before calling this resistant hypertension?
- Where does nutrition assessment fit?

Stage 2. The patient eats restaurant or takeout food twice daily. Typical “healthy” lunch is soup and a turkey sandwich. Dinner often includes restaurant noodles or pizza. The patient uses a potassium-based salt substitute at home after being told to reduce sodium.

- Which exposures matter for BP?
- Which create CKD/medication safety concerns?

Stage 3. The patient also stopped olive oil and uses butter/coconut oil because of online claims about seed oils.

- How would you counsel about dietary fat using substitution evidence?

- Create a two-week plan that can be assessed before adding medication, assuming there is no urgent need to intensify therapy today.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Home BP/technique/adherence, NSAIDs, alcohol, sodium exposure, restaurant foods, potassium salt substitutes, fat sources, sleep apnea risk, secondary causes.
INTERPRET	High sodium intake can blunt antihypertensive response; CKD/RAAS blockade change potassium safety; fat substitution affects LDL risk.
ACT	Reduce dominant sodium sources, avoid unsafe potassium salt substitutes when appropriate, replace saturated with unsaturated fat sources, and monitor home BP.
COLLABORATE	RDN for practical low-sodium plan; pharmacist for adherence/medication reconciliation; nephrology when indicated.

E. Facilitator Guide and Answer Key

Key reasoning points

- Nutrition history is part of resistant-hypertension evaluation, not an optional lifestyle footnote.
- Restaurant soups, breads, sandwiches, sauces, and pizza can create high sodium exposure even when choices seem “healthy.”
- Potassium-based salt substitutes require CKD/medication context.

Common pitfalls

- Escalating medications without checking adherence, measurement, sodium, NSAIDs, and secondary contributors.
- Recommending more potassium indiscriminately in CKD.
- Discussing saturated fat without naming the replacement nutrient/food.

Exemplar plan

- Confirm home readings and adherence; quantify sodium sources; stop or reassess potassium salt substitute; choose two restaurant-order modifications; restore unsaturated oils; recheck BP and potassium; then reassess medication needs.

F. Nutrition Clinical Pearls

- Diet can masquerade as medication resistance.
- Label/menu literacy is clinically useful in hypertension.
- The replacement for saturated fat matters.

G. Evidence Summary

AHA 2026 dietary guidance continues to emphasize lower sodium intake, unsaturated fats in place of saturated fats, and minimally processed dietary patterns.

CKD modifies the safety of potassium-rich interventions and salt substitutes; management should integrate kidney function and medications.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Is it truly resistant?	Measurement, adherence, secondary causes, sodium, medications.
Slide 2: Where sodium hides	Restaurant and packaged-food examples.
Slide 3: Potassium is not automatically safe	CKD + RAAS blockade + salt substitutes.
Slide 4: Fat substitution and LDL	Butter/coconut oil vs unsaturated oils.
Slide 5: Two-week therapeutic trial	Specific diet changes + home BP + labs + follow-up.

I. Assessment Package

Question 1. Which dietary product deserves immediate safety review?

Answer: The potassium-containing salt substitute because of CKD and RAAS blockade.

Rationale: It can contribute to hyperkalemia.

Question 2. Why is “reduce saturated fat” incomplete counseling?

Answer: Cardiovascular effects depend on the replacement; substituting unsaturated fat sources is different from replacing saturated fat with refined carbohydrate.

Rationale: Nutrition evidence is substitution-dependent.

Question 3. Name three non-nutrition factors to confirm before diagnosing resistant hypertension.

Answer: Examples: accurate BP technique/home readings, adherence, NSAIDs/other pressors, sleep apnea, secondary hypertension, white-coat effect.

Rationale: Keeps nutrition integrated within full clinical reasoning.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
6	Drug-nutrient interactions	Potassium salt substitute + RAAS blockade.
8	Labels/menu information	Learner identifies sodium burden.
30	Clinical integration	Learner uses diet as part of resistant-HTN plan.
49	Translate national guidance	Learner applies AHA guidance to real foods.

K. Required / Recommended Readings

- Lichtenstein AH, et al. 2026 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement from the American Heart Association. Circulation. 2026.
- KDIGO. 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney International. 2024.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Add heart failure to emphasize volume/sodium counseling.
- Use a culturally specific restaurant pattern.
- For inpatient conference, convert to recurrent hypertensive urgency after discharge.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Stage 2 safety huddle.
30 minutes	Stages 1-3 + two-week plan.
60 minutes	Full management discussion.
120 minutes	Add home-BP data interpretation, food-label comparison, and medication reconciliation.

N. Faculty Preparation Checklist

- Use local resistant hypertension definitions/pathways.
- Do not delay indicated pharmacologic treatment solely for a dietary trial.
- Reinforce that counseling and medication intensification can occur in parallel.

3. Chronic Diarrhea, Weight Loss, and Iron Deficiency: Do Not Miss Malabsorption

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Inpatient or ambulatory GI/IM conference | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Celiac disease with nutritional deficiencies and diagnostic pitfalls
Nutrition trigger	Self-initiated gluten restriction partially improves symptoms but threatens diagnostic yield
Primary learner task	Coordinate diagnostic testing, deficiency treatment, and safe nutrition management
HHS competencies	2, 3, 4, 6, 22, 27, 30, 39
Recommended assessment	Differential + diagnostic plan + nutrition repletion strategy

B. Learning Objectives

51. Build a differential for chronic diarrhea with weight loss and micronutrient deficiency.
52. Recognize when celiac disease is likely and how pre-test gluten restriction affects testing.
53. Identify nutritional deficiencies that may accompany malabsorption.
54. Coordinate correction of deficiencies without obscuring diagnosis.
55. Define RDN responsibilities after diagnosis and at follow-up.

C. Learner Case

Stage 1. A 34-year-old is referred for chronic diarrhea, 7-kg weight loss, iron-deficiency anemia, and low vitamin D. The patient has been “mostly gluten-free” for 6 weeks.

- What diagnoses are high priority?
- What does the current diet do to your diagnostic strategy?

Stage 2. The patient takes a proton pump inhibitor and an over-the-counter iron supplement but remains iron deficient. Albumin is mildly low. There is no overt bleeding.

- What additional deficiencies and causes should be considered?
- How should supplementation and diagnostic evaluation be coordinated?

Stage 3. Celiac disease is confirmed after an appropriate diagnostic pathway. The patient asks for a list of safe foods and whether all gluten-free packaged foods are healthy.

- What should the resident counsel directly?
- What should be handed off to an RDN?
- What should be monitored longitudinally?

D. Four Core Nutrition Questions

Domain	Prompt
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ASSESS	Weight trajectory, stool pattern, gluten exposure, supplements, medications, iron/vitamin status, bone health, family history, food access.
INTERPRET	Mucosal disease can produce multiple deficiencies; diet restriction alters test performance and can itself affect nutritional adequacy.
ACT	Preserve diagnostic validity, replenish deficiencies, institute strict gluten-free diet after diagnosis, and monitor response.
COLLABORATE	RDN for comprehensive gluten-free education, adequacy, cross-contact, and culturally appropriate substitutions.

E. Facilitator Guide and Answer Key

Key reasoning points

- The nutritional phenotype increases pretest probability of organic disease.
- Partial gluten restriction can make diagnostic testing less straightforward.
- Treatment includes both disease-specific diet and correction/monitoring of deficiencies.

Common pitfalls

- Telling the patient to “just avoid gluten” before the workup.
- Assuming symptoms alone distinguish celiac disease from intolerance.
- Ignoring bone health and micronutrient consequences.

Exemplar plan

- Clarify gluten exposure and testing strategy; evaluate anemia and other deficiencies; confirm diagnosis appropriately; initiate RDN-guided gluten-free diet; monitor symptoms, weight, serologies/labs, and nutritional recovery.

F. Nutrition Clinical Pearls

- Diet can be both diagnostic exposure and treatment.
- Malabsorption should be suspected when several deficiencies cluster.
- A nutritionally complete elimination diet requires more than a prohibited-food list.

G. Evidence Summary

Celiac disease may present with GI symptoms, iron deficiency, low bone density, and other nutrient deficiencies. Diagnostic accuracy can be affected by prior gluten avoidance.

After diagnosis, strict gluten avoidance is required, but RDN-guided education improves implementation and helps prevent nutritional gaps.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Pattern recognition	Diarrhea + weight loss + iron deficiency = organic disease until proven otherwise.

Slide 2: Testing and gluten exposure	Why diet history changes the diagnostic pathway.
Slide 3: Deficiency cluster	Iron, folate/B12, vitamin D, calcium, and others.
Slide 4: Treatment beyond avoidance	Adequacy, cross-contact, labels, follow-up.
Slide 5: Resident-RDN division of labor	Diagnosis/medical monitoring vs intensive dietary implementation.

I. Assessment Package

Question 1. Why is the patient's "mostly gluten-free" diet clinically relevant before testing?

Answer: Reduced gluten exposure may diminish serologic/histologic abnormalities and complicate diagnostic confirmation.

Rationale: Diet is part of test validity.

Question 2. Name three nutritional issues to assess beyond iron.

Answer: Examples: vitamin D/calcium, folate, B12, weight/energy intake, bone health, other micronutrients based on context.

Rationale: Malabsorption is often multi-nutrient.

Question 3. What is the most appropriate role for an RDN after diagnosis?

Answer: Comprehensive gluten-free diet education, adequacy assessment, label/cross-contact counseling, culturally appropriate substitutions, and follow-up.

Rationale: Recognizes interprofessional expertise.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
2	Pathologic malabsorption	Learner integrates mucosal disease and deficiencies.
3	Nutrient deficiencies	Learner treats and monitors multiple deficits.
22	Nutrition assessment	Learner gathers diet exposure and weight/lab history.
39	Interprofessional care	Learner defines RDN role.

K. Required / Recommended Readings

- American College of Gastroenterology. Clinical Guideline: Diagnosis and Management of Celiac Disease. 2023.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Replace celiac disease with pancreatic insufficiency, short bowel syndrome, or inflammatory bowel disease.

- Add refeeding risk if the patient is severely malnourished.
- Use an inpatient version after admission for severe electrolyte disturbance.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Diagnostic pitfall: gluten avoidance before testing.
30 minutes	Add deficiency management.
60 minutes	Full case + RDN handoff plan.
120 minutes	Add differential diagnosis, lab interpretation, and discharge counseling simulation.

N. Faculty Preparation Checklist

- Follow current diagnostic guidelines and local GI testing pathways.
- Avoid giving a gluten challenge protocol unless faculty are prepared to teach it accurately.
- Keep supplement recommendations individualized.

4. The Meal Triad: Preventing Inpatient Dysglycemia Through Nutrition-Insulin Coordination

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Inpatient IM wards or endocrine rotation | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Hospital diabetes care, meal delivery, prandial insulin, poor intake, and discharge planning
Nutrition trigger	Recurrent inpatient hypo/hyperglycemia caused by mismatch among glucose checks, meals, and insulin
Primary learner task	Treat hospital nutrition as part of medication safety and systems-based practice
HHS competencies	6, 22, 30, 39, 40, 57, 59
Recommended assessment	Root-cause analysis + order redesign + discharge plan

B. Learning Objectives

56. Identify timing mismatches among glucose monitoring, meal delivery, and prandial insulin as preventable causes of inpatient dysglycemia.
57. Assess nutritional intake and appetite before interpreting glucose trends.
58. Explain why fixed “diabetic diet” language is less useful than individualized medical nutrition therapy and coordinated carbohydrate delivery.
59. Design a safer inpatient workflow and discharge nutrition plan.
60. Use RDN and diabetes-education resources appropriately.

C. Learner Case

Stage 1. A 72-year-old with type 2 diabetes is admitted with pneumonia. Basal-bolus insulin is ordered. Over 48 hours, glucose ranges from 52 to 310 mg/dL. The team is asked to increase insulin because of several readings >250 mg/dL.

- What data must be reviewed before changing doses?
- How can meal intake create misleading glucose patterns?

Stage 2. Chart review shows fingersticks often occur 60-90 minutes before trays arrive. Prandial insulin is sometimes administered before the patient receives food. The patient eats 25-75% of meals because of nausea.

- What is the systems problem?
- What immediate changes reduce risk?

Stage 3. The patient is improving and will discharge tomorrow. Appetite remains below baseline and family members prepare most meals.

- What nutrition and medication questions must be resolved before discharge?

- Who should be involved?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Meal timing, percent intake, nausea, NPO status, nutrition orders, insulin timing, renal function, steroid exposure, home regimen and food access.
INTERPRET	Dysglycemia may reflect workflow and variable carbohydrate intake rather than inadequate insulin dose alone.
ACT	Coordinate the “meal triad,” tailor prandial insulin to intake and local protocol, manage nausea, and create a realistic discharge plan.
COLLABORATE	RDN, nursing, pharmacy, diabetes educator, and case management depending on needs.

E. Facilitator Guide and Answer Key

Key reasoning points

- The ADA describes coordination of glucose check, meal delivery, and nutritional insulin as a “meal triad.”
- Inpatient MNT goals include adequate energy, glycemic optimization, preferences, and discharge planning.
- Escalating insulin without reviewing intake can worsen hypoglycemia.

Common pitfalls

- Treating every high glucose as a dosing failure.
- Ignoring percentage of meal consumed.
- Discharging on pre-hospital doses despite major changes in intake or clinical status.

Exemplar plan

- Fix timing workflow; document intake; adjust prandial strategy to local protocol and actual meals; address nausea; reassess basal needs; involve RDN/diabetes educator; reconcile regimen and nutrition plan before discharge.

F. Nutrition Clinical Pearls

- Inpatient nutrition is medication safety.
- Hospital glucose variability is often a systems problem.
- Discharge planning should reconcile medications with expected food intake.

G. Evidence Summary

ADA 2026 hospital guidance emphasizes individualized MNT and coordination of glucose checks, meal delivery, and nutritional insulin. Variable intake increases risk for both hypoglycemia and hyperglycemia.

The hospital plan should address adequate calories, glycemic goals, patient preferences, and transition to the outpatient setting.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Why the glucose is swinging	Illness + steroids + renal function + variable intake + timing.
Slide 2: The meal triad	Glucose check, tray arrival, nutritional insulin.
Slide 3: Do not treat the number in isolation	Review intake and workflow before dose escalation.
Slide 4: Nutrition order as therapy	Individualized MNT and adequate intake.
Slide 5: Safe discharge	Expected intake + medication reconciliation + education + follow-up.

I. Assessment Package

Question 1. What is the most likely modifiable contributor to the patient's hypoglycemia?

Answer: Prandial insulin administered without reliable meal delivery/intake.

Rationale: The timing mismatch creates preventable hypoglycemia.

Question 2. What three elements constitute the “meal triad”?

Answer: Glucose check, meal delivery, and nutritional/prandial insulin coverage.

Rationale: Tests systems-based diabetes care.

Question 3. Name three discharge items that require reconciliation.

Answer: Examples: expected intake/appetite, insulin or hypoglycemia-causing medications, glucose monitoring plan, meal support, RDN/education referral, follow-up.

Rationale: Transitions are high-risk when nutrition changes.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
6	Drug-nutrient interactions	Learner links food intake to insulin safety.
30	Clinical integration	Nutrition becomes part of glycemic management.
39	Interprofessional care	Nursing/RDN/pharmacy/educator coordination.
59	Medication-nutrition synergy	Learner adjusts therapy to real intake.

K. Required / Recommended Readings

- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Add glucocorticoids for advanced insulin-pattern reasoning.
- Use enteral feeding for a higher-acuity version.
- Convert to a night-float 15-minute safety case.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Root-cause analysis of Stage 2.
30 minutes	Stages 1-2 + revised orders/workflow.
60 minutes	Full case + discharge discussion.
120 minutes	Add glucose-flow-sheet review, meal intake data, order-set critique, and interprofessional simulation.

N. Faculty Preparation Checklist

- Align insulin recommendations with local hospital protocols.
- Do not teach a one-size-fits-all insulin adjustment algorithm.
- Include nursing workflow perspective if possible.

5. Hyperkalemia Without Starving the Diet: CKD, RAAS Inhibitors, and Potassium Strategy

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Ambulatory IM/nephrology or inpatient consult conference | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	CKD with recurrent hyperkalemia while on kidney-protective therapy
Nutrition trigger	The instinct to stop RAAS blockade or broadly restrict produce without identifying the cause
Primary learner task	Preserve evidence-based pharmacotherapy and diet quality while managing potassium risk
HHS competencies	6, 11, 22, 30, 39, 40, 57, 59
Recommended assessment	Etiologic framework + diet/medication plan + RDN handoff

B. Learning Objectives

61. Use a structured differential for recurrent hyperkalemia in CKD.
62. Identify dietary potassium additives and salt substitutes as high-yield exposures.
63. Avoid reflexive discontinuation of beneficial RAAS-inhibiting therapy when correctable contributors exist.
64. Balance potassium restriction with fiber, diet quality, and malnutrition risk.
65. Coordinate RDN, medication, and laboratory follow-up.

C. Learner Case

Stage 1. A 68-year-old with diabetic CKD (eGFR 35) and albuminuria has potassium 5.7 mmol/L twice in one month while taking an ACE inhibitor. A colleague suggests stopping the ACE inhibitor and giving a “low-potassium diet sheet.”

- What should be assessed first?
- What are the tradeoffs of this approach?

Stage 2. Diet review identifies a potassium chloride salt substitute, a daily “low-sodium” packaged soup containing potassium additives, and constipation. Bicarbonate is 20 mmol/L.

- Which contributors are high priority?
- How might food additives differ from whole-food potassium in practical management?

Stage 3. The patient is worried that “kidney diets mean I can’t eat anything healthy.”

- Create a plan that preserves diet quality and kidney-protective therapy if clinically appropriate.
- What is the role of a renal RDN?

D. Four Core Nutrition Questions

Domain	Prompt
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ASSESS	Kidney trajectory, RAASi/MRA and other drugs, acidosis, constipation, salt substitutes, additives, supplements, dietary pattern, nutritional status.
INTERPRET	Hyperkalemia is multifactorial; highly bioavailable additives and salt substitutes may be more actionable than indiscriminate produce restriction.
ACT	Correct reversible contributors, individualize potassium exposure, manage acidosis/constipation as appropriate, consider potassium-lowering therapies per clinical context, and preserve beneficial drugs when possible.
COLLABORATE	Renal RDN and nephrology as appropriate; pharmacist for medication review.

E. Facilitator Guide and Answer Key

Key reasoning points

- The goal is not “lowest potassium diet”; it is safe potassium control while preserving overall nutrition and indicated therapies.
- Potassium chloride salt substitutes and additives are high-yield history elements.
- Protein, sodium, potassium, and energy recommendations can conflict in CKD, making RDN co-management valuable.

Common pitfalls

- Stopping RAAS therapy reflexively without addressing contributors.
- Handing out generic food-ban lists.
- Ignoring acidosis and constipation.

Exemplar plan

- Stop potassium salt substitute/additive-heavy products; address constipation/acidosis; review medications; obtain RDN-guided diet plan; repeat potassium promptly; decide on RAAS continuation and adjunctive therapy based on response and risk.

F. Nutrition Clinical Pearls

- A “renal diet” should be individualized, not a universal prohibition list.
- Dietary potassium bioavailability and source matter.
- Medication preservation can be a nutrition-management goal.

G. Evidence Summary

KDIGO 2024 emphasizes individualized CKD nutrition, healthy dietary patterns, sodium reduction, appropriate protein intake, and medication stewardship.

Recurrent hyperkalemia should prompt evaluation of medication, metabolic, GI, and dietary contributors rather than a single-cause diet model.

H. Five-Slide Teaching Deck

Slide	Suggested content
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Slide 1: Hyperkalemia differential	Kidney function, medications, acidosis, constipation, diet.
Slide 2: Find the concentrated sources	Salt substitutes and potassium additives.
Slide 3: Protect diet quality	Why broad produce restriction can backfire.
Slide 4: Protect indicated therapy	RAAS benefits vs potassium risk.
Slide 5: Monitoring loop	Diet change, labs, meds, RDN follow-up.

I. Assessment Package

Question 1. Which dietary exposure is most immediately actionable?

Answer: The potassium chloride salt substitute and additive-rich product.

Rationale: These can provide concentrated, highly bioavailable potassium.

Question 2. Name two non-dietary contributors present.

Answer: Metabolic acidosis and constipation; CKD and RAAS blockade are also relevant.

Rationale: Hyperkalemia is multifactorial.

Question 3. Why might preserving RAAS inhibition matter?

Answer: It may provide kidney and cardiovascular benefit in albuminuric CKD, so correctable hyperkalemia contributors should be addressed when clinically appropriate.

Rationale: Management balances treatment benefits and safety.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
6	Drug-nutrient interactions	RAAS therapy and potassium exposure.
22	Nutrition assessment	Source-specific potassium history.
39	Interprofessional care	Renal RDN co-management.
59	Medication-nutrition synergy	Diet strategy supports safe pharmacotherapy.

K. Required / Recommended Readings

- KDIGO. 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney International. 2024.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Add finerenone or an SGLT2 inhibitor discussion based on local teaching goals.
- Use dialysis for a different potassium/protein context.
- Add frailty to highlight risks of overrestriction.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Identify three reversible contributors.
30 minutes	Build a prioritized management plan.
60 minutes	Full case + medication preservation debate.
120 minutes	Add food-label additive comparison, lab trajectory, and RDN consult note.

N. Faculty Preparation Checklist

- Use current local hyperkalemia and RAASi guidance.
- Avoid specific potassium binder prescribing unless within faculty scope and protocol.
- Emphasize close laboratory follow-up.

6. Iron Pills Are Not Working: Absorption, Blood Loss, and Medication-Food Interactions

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Ambulatory IM or hospital follow-up | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Persistent iron-deficiency anemia despite oral iron
Nutrition trigger	Multiple factors reduce iron absorption while occult blood loss remains possible
Primary learner task	Integrate diet, medication timing, adherence, and etiologic workup
HHS competencies	3, 6, 20, 22, 27, 30, 40
Recommended assessment	Root-cause analysis + medication/diet timing plan + diagnostic safety

B. Learning Objectives

- 66. Evaluate failure of oral iron using adherence, dosing, absorption, ongoing loss, and diagnosis.
- 67. Recognize relevant food and medication interactions affecting absorption.
- 68. Provide practical counseling that improves tolerance and adherence.
- 69. Avoid attributing persistent iron deficiency to diet without evaluating blood loss/malabsorption.
- 70. Know when RDN, GI, or gynecology referral is needed.

C. Learner Case

Stage 1. A 58-year-old with iron-deficiency anemia has taken oral iron for 3 months, but hemoglobin and ferritin have barely improved. The patient reports taking the iron every morning with coffee and a calcium-containing breakfast and takes a PPI.

- What could explain poor response?
- What details of dosing and symptoms matter?

Stage 2. The patient has intermittent epigastric discomfort and no obvious bleeding. Colon cancer screening is overdue. Diet is largely plant-based but varied.

- What should not be missed?
- How would you alter the framing from “you need to eat more iron”?

Stage 3. The patient is frustrated by constipation from the supplement and wants to stop it.

- What practical strategies could improve tolerability and absorption?
- When would alternate formulations/routes or specialty evaluation be considered?

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Adherence, formulation/dose, timing with food/coffee/calcium, PPI use, GI symptoms,

	bleeding, diet, malabsorption, constipation.
INTERPRET	Failure can reflect low intake, poor absorption, intolerance/nonadherence, or ongoing losses; medication and meal timing can matter.
ACT	Optimize administration/tolerability within evidence-based practice, investigate blood loss/malabsorption, and choose replacement route based on severity and response.
COLLABORATE	RDN for dietary adequacy; GI/gynecology based on source; pharmacist for regimen simplification.

E. Facilitator Guide and Answer Key

Key reasoning points

- Persistent iron deficiency is a diagnosis requiring explanation, not just supplementation.
- Coffee/tea, calcium, and acid suppression can be relevant depending on regimen and context.
- Constipation can drive nonadherence and should be addressed directly.

Common pitfalls

- Assuming a plant-based diet is the sole cause.
- Escalating dose without clarifying adherence and tolerance.
- Missing age-appropriate evaluation for GI blood loss.

Exemplar plan

- Clarify actual use; separate iron from major absorption inhibitors when feasible; choose a tolerable regimen; address constipation; reassess need for PPI; complete indicated blood-loss/malabsorption evaluation; monitor response.

F. Nutrition Clinical Pearls

- When a nutrient treatment “fails,” think like a pharmacologist: dose, adherence, absorption, interaction, loss.
- Diet history should inform but not replace diagnostic evaluation.
- Tolerability is part of efficacy.

G. Evidence Summary

Iron replacement response depends on etiology, absorption, adherence, ongoing losses, and treatment regimen. Dietary bioavailability and medication interactions can be clinically relevant.

Persistent or unexplained iron deficiency warrants etiologic evaluation appropriate to age, sex, symptoms, and risk factors.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: Why iron therapy fails	Adherence, absorption, interaction, loss, wrong diagnosis.
Slide 2: The meal and medication matter	Coffee/tea, calcium, PPIs, timing.

Slide 3: Do not blame the diet	Plant-based adequacy and blood-loss evaluation.
Slide 4: Improve tolerability	Regimen simplification and constipation management.
Slide 5: Follow the response	CBC/ferritin trajectory + etiologic workup.

I. Assessment Package

Question 1. Which history element most directly suggests impaired absorption from the current routine?

Answer: Taking iron with coffee/calcium-containing breakfast; PPI use may also contribute depending on context.

Rationale: Administration context matters.

Question 2. What diagnostic safety issue is especially important in this patient?

Answer: Evaluation for GI blood loss/malignancy because screening is overdue and iron deficiency is persistent.

Rationale: Do not reduce persistent deficiency to diet.

Question 3. Give two strategies that may improve adherence.

Answer: Examples: adjust dosing schedule/formulation per evidence and tolerability; address constipation; simplify timing; provide clear written instructions.

Rationale: Practical implementation affects treatment success.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
3	Nutrient deficiency treatment	Learner manages iron deficiency.
6	Drug-nutrient interactions	Learner assesses PPI and meal timing.
20	Bioavailability	Learner applies absorption modifiers.
30	Clinical integration	Learner combines replacement with workup.

K. Required / Recommended Readings

- NIH Office of Dietary Supplements. Iron: Fact Sheet for Health Professionals.
- Current society guidance on iron-deficiency anemia evaluation applicable to local practice.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use bariatric surgery or celiac disease for a malabsorption-heavy variant.
- Use heavy menstrual bleeding for a reproductive-age variant.
- Convert to inpatient IV iron decision-making if desired.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Why the iron is not working: identify 4 causes.
30 minutes	Add diagnostic safety and counseling.
60 minutes	Full case + management plan.
120 minutes	Add medication reconciliation, lab trends, and shared-decision simulation.

N. Faculty Preparation Checklist

- Keep exact iron dosing recommendations aligned with current local guidance.
- Avoid overclaiming the magnitude of individual food-drug interactions.
- Emphasize etiologic evaluation.

7. Frailty, CKD, and the Protein Paradox

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Geriatrics, ambulatory IM, or inpatient geriatrics consult | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	Sarcopenia/frailty with CKD and conflicting protein goals
Nutrition trigger	A patient receives simultaneous advice to “eat less protein for the kidneys” and “eat more protein for muscle”
Primary learner task	Reconcile disease-specific nutrition recommendations around patient goals and risk
HHS competencies	5, 11, 22, 24, 30, 39, 40, 57
Recommended assessment	Risk-benefit synthesis + individualized plan

B. Learning Objectives

71. Recognize frailty and malnutrition risk as modifiers of standard CKD protein advice.
72. Prioritize functional outcomes and total energy adequacy in an older adult losing weight and strength.
73. Explain why rigid disease-specific nutrition targets may conflict in multimorbidity.
74. Create an individualized plan with RDN input rather than choosing one disease guideline in isolation.
75. Define monitoring metrics for nutrition and function.

C. Learner Case

Stage 1. An 82-year-old with CKD G3b, osteoporosis, and hypertension has lost 7% body weight in 4 months and has progressive weakness. A prior handout instructed the patient to “limit protein for kidney health.”

- Which risks are competing?
- Which problem appears most urgent?

Stage 2. Diet recall shows ~2 small meals/day, minimal protein, poor appetite, and fear of worsening kidney disease. eGFR has been stable. The patient needs arms to rise from a chair.

- How should frailty and sarcopenia alter the nutrition discussion?
- What should be assessed before prescribing any numeric protein target?

Stage 3. The patient’s daughter asks whether high-protein shakes should be started immediately.

- How would you answer?
- Build a plan integrating energy intake, protein, kidney status, exercise/rehab, bone health, and monitoring.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Weight loss, intake, strength/function, CKD

	stability, albuminuria, metabolic stability, energy intake, protein sources, swallowing/dentition, food access.
INTERPRET	The risk of undernutrition and functional decline may outweigh theoretical benefits of protein restriction in frail older adults; CKD guidance explicitly requires individualization.
ACT	Correct inadequate energy/intake, choose feasible protein sources and amounts with renal RDN input, support resistance/rehab, and manage bone/fall risk.
COLLABORATE	Renal/geriatric RDN, PT/OT, geriatrics/nephrology, dentistry/social work as needed.

E. Facilitator Guide and Answer Key

Key reasoning points

- KDIGO notes that older adults with frailty/sarcopenia may require higher protein and calorie targets than standard CKD restriction would suggest.
- A stable eGFR does not make progressive weight loss benign.
- Protein targets cannot be interpreted without energy adequacy and functional status.

Common pitfalls

- Following a renal handout rigidly despite malnutrition.
- Responding with an equally rigid high-protein prescription.
- Ignoring physical rehabilitation and social barriers.

Exemplar plan

- Treat unintentional weight loss/frailty as urgent; stop overly restrictive messaging; obtain RDN assessment; increase energy and protein within kidney-safe individualized goals; initiate resistance/functional rehab; monitor weight, strength, intake, kidney parameters, and symptoms.

F. Nutrition Clinical Pearls

- Multimorbidity makes nutrition a prioritization problem, not a guideline-recitation exercise.
- In frailty, undernutrition can be the dominant immediate threat.
- The “right” protein target depends on kidney stage, metabolic stability, energy intake, and function.

G. Evidence Summary

KDIGO 2024 generally recommends avoiding high protein intake in CKD at risk of progression but highlights special consideration for older adults with frailty and sarcopenia, in whom higher protein and calorie targets may be appropriate.

Nutrition goals should be individualized with expert dietitian involvement and reassessed as function and disease status change.

H. Five-Slide Teaching Deck

Slide	Suggested content
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Slide 1: The protein paradox	Kidney-protection goals vs sarcopenia/frailty risk.
Slide 2: Which risk is dominant now?	Weight loss, function, CKD stability, metabolic state.
Slide 3: Do not use one number for everyone	Protein depends on context and energy intake.
Slide 4: Food + resistance activity	Functional recovery requires both.
Slide 5: Monitoring plan	Weight, strength, intake, kidney labs, falls, symptoms.

I. Assessment Package

Question 1. What is the most concerning current finding?

Answer: Progressive unintentional weight loss with marked weakness/frailty.

Rationale: This signals immediate nutritional and functional risk.

Question 2. Why should a standard CKD protein handout not be followed rigidly?

Answer: Frailty, sarcopenia, energy adequacy, disease stability, and individual goals modify the risk-benefit balance.

Rationale: Guidelines require individualization.

Question 3. Name four monitoring measures.

Answer: Examples: weight trajectory, dietary intake, chair-rise/grip/function, eGFR/potassium/bicarbonate, falls, appetite, quality of life.

Rationale: Shows longitudinal management.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
5	Requirements across lifespan	Older-adult needs modify standard targets.
24	Malnutrition risk	Weight loss and weakness drive urgency.
30	Clinical integration	Learner reconciles conflicting disease guidance.
39	Interprofessional care	Renal/geriatric RDN and PT collaboration.

K. Required / Recommended Readings

- KDIGO. 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney International. 2024.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Add dialysis or advanced CKD to change the protein context.
- Add dysphagia or dementia for geriatric complexity.
- Use a vegetarian patient to discuss high-quality plant protein options.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Identify dominant risk and why the handout is unsafe.
30 minutes	Build a prioritized plan.
60 minutes	Full case + guideline reconciliation.
120 minutes	Add malnutrition screen, functional assessment, and RDN/PT co-management simulation.

N. Faculty Preparation Checklist

- Avoid universal numeric protein targets in the case answer key.
- Make frailty and metabolic stability explicit modifiers.
- Use local RDN/nephrology referral pathways.

8. MASLD in the Era of GLP-1 Therapy: Treat the Liver, the Weight, or the Cardiovascular Risk?

Audience: Internal medicine residents (PGY-1 to PGY-3) | Primary curricular home: Ambulatory IM, hepatology, obesity, or endocrine conference | Standard duration: 120 minutes

A. Case at a Glance

Element	Content
Clinical focus	MASLD with obesity, prediabetes, dyslipidemia, and pharmacologic weight management
Nutrition trigger	Patient wants a liver-specific diet and assumes improved ALT means disease is resolved
Primary learner task	Integrate fibrosis risk, cardiometabolic risk, nutrition, and obesity treatment
HHS competencies	7, 11, 22, 30, 39, 49, 55, 57, 60
Recommended assessment	Risk stratification + integrated treatment plan + counseling

B. Learning Objectives

76. Prioritize fibrosis assessment in MASLD rather than relying on transaminases or steatosis alone.
77. Integrate dietary treatment with obesity pharmacotherapy and cardiovascular risk reduction.
78. Counsel on dietary patterns and alcohol without using detox or supplement framing.
79. Recognize that the same high-quality diet can address MASLD, diabetes risk, BP, and CVD risk.
80. Define longitudinal metrics for response.

C. Learner Case

Stage 1. A 52-year-old with obesity, prediabetes, hypertension, LDL-C 156 mg/dL, and hepatic steatosis has started a GLP-1-based anti-obesity medication. After 4 months, weight is down 8% and ALT has normalized. The patient asks if the liver disease is “gone.”

- What determines prognosis in MASLD?
- What should be reassessed despite improved ALT?

Stage 2. Diet quality has improved somewhat, but the patient still drinks several sugar-sweetened beverages weekly and takes multiple “liver detox” supplements. Physical activity is minimal.

- Which exposures should be targeted?
- How would you discuss supplements and dietary pattern?

Stage 3. The patient asks whether medication alone is enough because eating changes are difficult.

- How do you frame pharmacotherapy and nutrition as complementary?
- Create a monitoring plan for liver and cardiometabolic outcomes.

D. Four Core Nutrition Questions

Domain	Prompt
ASSESS	Fibrosis risk, weight trajectory, diet, beverages,

	alcohol, supplements, activity, diabetes/lipids/BP, medication tolerance, muscle/function.
INTERPRET	Fibrosis drives liver-related outcomes; cardiometabolic disease drives much of overall risk. ALT normalization does not prove fibrosis resolution.
ACT	Continue evidence-based obesity/metabolic treatment, improve diet quality and activity, stop unproven potentially harmful supplements, manage CVD risk, and reassess fibrosis per pathway.
COLLABORATE	RDN for individualized dietary implementation; hepatology based on fibrosis risk; obesity/endocrine team as needed.

E. Facilitator Guide and Answer Key

Key reasoning points

- MASLD care is fundamentally multisystem.
- Fibrosis risk stratification and cardiovascular risk management are central.
- Pharmacotherapy can facilitate weight loss but does not eliminate the need to monitor nutrition quality, physical activity, and treatment tolerability.

Common pitfalls

- Using ALT normalization as proof of cure.
- Focusing on a “liver diet” while ignoring LDL/BP/prediabetes.
- Allowing supplement use to continue without reviewing efficacy and hepatotoxicity risk.

Exemplar plan

- Recalculate fibrosis risk; continue effective obesity therapy with nutrition monitoring; remove sugary beverages and unproven supplements; build a Mediterranean-style or otherwise high-quality individualized pattern; increase physical activity; treat LDL/BP/prediabetes; follow liver and cardiometabolic metrics.

F. Nutrition Clinical Pearls

- The best MASLD plan often looks like the best cardiovascular and diabetes-prevention plan.
- Medication and nutrition are complementary, not competing treatments.
- ALT is a biomarker, not a complete disease-status measure.

G. Evidence Summary

The 2026 AGA MASLD pathway emphasizes fibrosis risk stratification, Mediterranean-style dietary patterns, physical activity, weight loss when appropriate, and aggressive cardiometabolic risk management.

Current pathways also incorporate obesity and diabetes therapies with liver benefit when clinically indicated; lifestyle treatment remains foundational and should be individualized.

H. Five-Slide Teaching Deck

Slide	Suggested content
Slide 1: What matters most in MASLD?	Fibrosis, cardiometabolic risk, and longitudinal trajectory.
Slide 2: ALT is not enough	Normal enzymes do not establish resolution.
Slide 3: One diet, multiple targets	Mediterranean-style/high-quality patterns support liver and CVD goals.
Slide 4: Medication + nutrition	Complementary obesity/metabolic treatment.
Slide 5: Follow-up dashboard	Fibrosis risk, weight, BP, lipids, glycemia, diet, activity, tolerance.

I. Assessment Package

Question 1. Which feature most strongly determines liver-related prognosis?

Answer: Fibrosis severity/risk.

Rationale: Steatosis or ALT alone is insufficient.

Question 2. Why is normalized ALT not enough to declare MASLD resolved?

Answer: ALT can normalize despite persistent steatosis or fibrosis; disease status requires broader assessment.

Rationale: Avoids biomarker overinterpretation.

Question 3. Name three outcomes to monitor in addition to liver enzymes.

Answer: Examples: fibrosis risk, weight/waist, glycemia, LDL/non-HDL, BP, activity, diet quality, medication tolerability, muscle/function.

Rationale: MASLD management is multisystem.

J. HHS Competency Crosswalk

HHS #	Competency addressed	How demonstrated
49	Translate dietary guidance	Learner applies dietary pattern guidance to MASLD.
55	GLP-1 + lifestyle counseling	Learner integrates pharmacotherapy with nutrition.
57	Disease-specific dietary strategies	Learner uses evidence-based MASLD treatment.
60	Food-based chronic disease management	Learner targets liver and cardiometabolic risk together.

K. Required / Recommended Readings (see appendix for full citations)

- American Gastroenterological Association. Clinical Care Pathway for Risk Stratification and Management of Patients with MASLD. 2026.

- American Diabetes Association. Standards of Care in Diabetes—2026, Sections 3, 5, 8, and 16 as applicable. Diabetes Care. 2026.
- Lichtenstein AH, et al. 2026 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement from the American Heart Association. Circulation. 2026.
- Dietary Guidelines for Americans, 2025-2030. U.S. Departments of HHS and USDA.
- HHS Medical Education Nutrition Competency Framework. 2026.

L. Adaptation Guide

- Use lean MASLD to prevent weight-centric thinking.
- Add FIB-4 values and referral thresholds according to the local pathway.
- Add alcohol or statin misinformation as an advanced branch.

M. Time-Flexible Delivery

Version	How to deliver
15 minutes	Is MASLD gone? Discuss ALT vs fibrosis.
30 minutes	Add integrated treatment priorities.
60 minutes	Full case + monitoring plan.
120 minutes	Add FIB-4 calculation, supplement review, and shared-decision role-play.

N. Faculty Preparation Checklist

- Use current local fibrosis referral cutoffs.
- Review supplement safety without making unsupported blanket claims.
- Ensure statin and obesity-therapy teaching follows current indications and contraindications.

Appendix 1. Suggested Standard Evaluation Rubric

Domain	1 - Needs improvement	2 - Developing	3 - Competent	4 - Advanced
Nutrition assessment	Misses major nutrition data	Identifies some relevant data	Obtains focused, clinically relevant nutrition history	Prioritizes nutrition data within full medical context
Clinical interpretation	Uses simplistic single-nutrient explanation	Recognizes multiple mechanisms but limited synthesis	Integrates physiology, disease, and dietary pattern	Integrates uncertainty, tradeoffs, and competing comorbidities
Recommendation	Generic or restrictive advice	Partially individualized recommendation	Evidence-based, feasible, patient-centered plan	Uses substitution, shared decision-making, and monitoring strategy
Interprofessional care	Does not identify referral need	Names referral but unclear role	Appropriately defines RDN/team role	Creates effective handoff/co-management plan
Communication	Moralizing or jargon-heavy	Generally understandable	Respectful, culturally responsive, actionable	Elicits goals/barriers and communicates uncertainty skillfully

Appendix 2. Faculty Fidelity Checklist

- The session teaches the four-step ASSESS → INTERPRET → ACT → COLLABORATE framework.
- Faculty distinguish evidence from ideology and avoid presenting one dietary pattern as universally required.
- Recommendations use specific substitutions or behaviors rather than vague “eat healthier” advice.
- Culture, affordability, access, health literacy, and patient goals are incorporated.
- The physician role and RDN role are explicitly distinguished.
- At least one competency is assessed rather than documenting attendance alone.
- Any disease-specific thresholds or medication recommendations are checked against current local/national guidance before teaching.

Appendix 3. Guideline Reference Shelf

- **U.S. Department of Health and Human Services, Office of the Secretary.** *Medical Education Nutrition Competency Framework*. 2026.
- **U.S. Department of Health and Human Services; U.S. Department of Agriculture.** *Dietary Guidelines for Americans, 2025-2030*. 10th ed. January 2026.
- **American Diabetes Association Professional Practice Committee for Diabetes.** 3. Prevention or Delay of Diabetes and Associated Comorbidities: Standards of Care in Diabetes-2026. *Diabetes Care*. 2026;49(Suppl 1):S50-S60. doi:10.2337/dc26-S003.

- **American Diabetes Association Professional Practice Committee for Diabetes.** 5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes-2026. *Diabetes Care*. 2026;49(Suppl 1):S89-S131. doi:10.2337/dc26-S005.
- **American Diabetes Association Professional Practice Committee for Diabetes.** 8. Obesity and Weight Management for the Prevention and Treatment of Diabetes: Standards of Care in Diabetes-2026. *Diabetes Care*. 2026;49(Suppl 1):S166-S182. doi:10.2337/dc26-S008.
- **American Diabetes Association Professional Practice Committee for Diabetes.** 16. Diabetes Care in the Hospital: Standards of Care in Diabetes-2026. *Diabetes Care*. 2026;49(Suppl 1):S339-S355. doi:10.2337/dc26-S016.
- **Lichtenstein AH, Khera A, Anderson CAM, Appel LJ, DeSilva DM, Gardner C, Hu FB, Jones DW, Petersen KS; on behalf of the American Heart Association.** 2026 Dietary Guidance to Improve Cardiovascular Health: A Scientific Statement From the American Heart Association. *Circulation*. 2026. doi:10.1161/CIR.0000000000001435.
- **Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group.** KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney Int*. 2024;105(4S):S117-S314. doi:10.1016/j.kint.2023.10.018.
- Younossi ZM, Kalligeros M, Wong VW, Al-Naamani KM, Tacke F, Tsochatzis E, Crespo J, El-Kassas M, Bril F, Arrese M, Caussy C, Spearman CW, Gastaldelli A, Pessoa MG, Gadano A, Shubbrook JH, Duseja A, Eguchi Y, Chan WK, Fan JG, Holleboom AG, Yu ML, Kim J, Kawaguchi T, Villela-Nogueira C, Oliveria CP, Kong AP, Lam B, Giles H, Betel M, Ong JP, Burra P, Yilmaz Y, Pearlman B, Buti M, Papatheodoridis G, Abreu ES, Abdelmalek M, Alkhouri N, Nader F, Stepanova M, Racila A, Paik J, Ivancovsky Wajcman D, Grinshpan LS, Roberts SK, Alqahtani SA, Zelber-Sagi S, Castera L, Henry L. Updated Global Consensus Recommendations for Risk Stratification, Treatment Initiation, and Response Monitoring in Metabolic Dysfunction-Associated Steatotic Liver Disease. *Clin Gastroenterol Hepatol*. 2026 Sep;24(9):2333-2347. doi: 10.1016/j.cgh.2026.03.030. Epub 2026 Apr 7. PMID: 41950980.
- **Rubio-Tapia A, Hill ID, Semrad C, Kelly CP, Greer KB, Limketkai BN, Lebwohl B.** American College of Gastroenterology Guidelines Update: Diagnosis and Management of Celiac Disease. *Am J Gastroenterol*. 2023;118(1):59-76. doi:10.14309/ajg.0000000000002075.
- **National Institutes of Health, Office of Dietary Supplements.** *Iron: Fact Sheet for Health Professionals*. Updated September 4, 2025.

Annual review statement: Because nutrition guidance evolves rapidly, adopting institutions should review this reference list at least annually and replace guidelines, standards, and federal resources with the most current available versions before each curriculum cycle.