

The Evolving Plate

How Nutritional Needs Shift Throughout the Obesity Care Journey

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Objectives

- Analyze how physiology, treatment phase, and readiness for change influence nutrition priorities to deliver patient-centered, responsive care.
- Implement stage-appropriate counseling and nutrition strategies to support fat loss, muscle health, and improve patient engagement and sustainability.

One patient. Four phases.

1. **Pre-treatment:**
   Know what and who you're treating.
2. **Initiation + Active Weight Loss:**
   Create an effective nutrition strategy.
3. **Titration + Treatment Adjustment:**
   Adapt when physiology and tolerance change.
4. **Maintenance + Transition:**
   Plan for the biology of long-term treatment.

At every phase, we'll ask four questions:

- What is happening physiologically?
- What does that feel like to the patient?
- What goes wrong if we keep giving the same advice?
- How do we pivot the conversation and evolve the plate?

PHASE 1: PRE-TREATMENT

Before we prescribe

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PRE-TREATMENT — Week 0

"I know what I'm supposed to eat. I just can't stick with it."

A1c 6.6% | knee OA | food noise | 3 previous wt loss attempts

Obesity

"A **chronic, relapsing, multi-factorial, neurobehavioral disease**, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences."

the Obesity Medicine Association (OMA)

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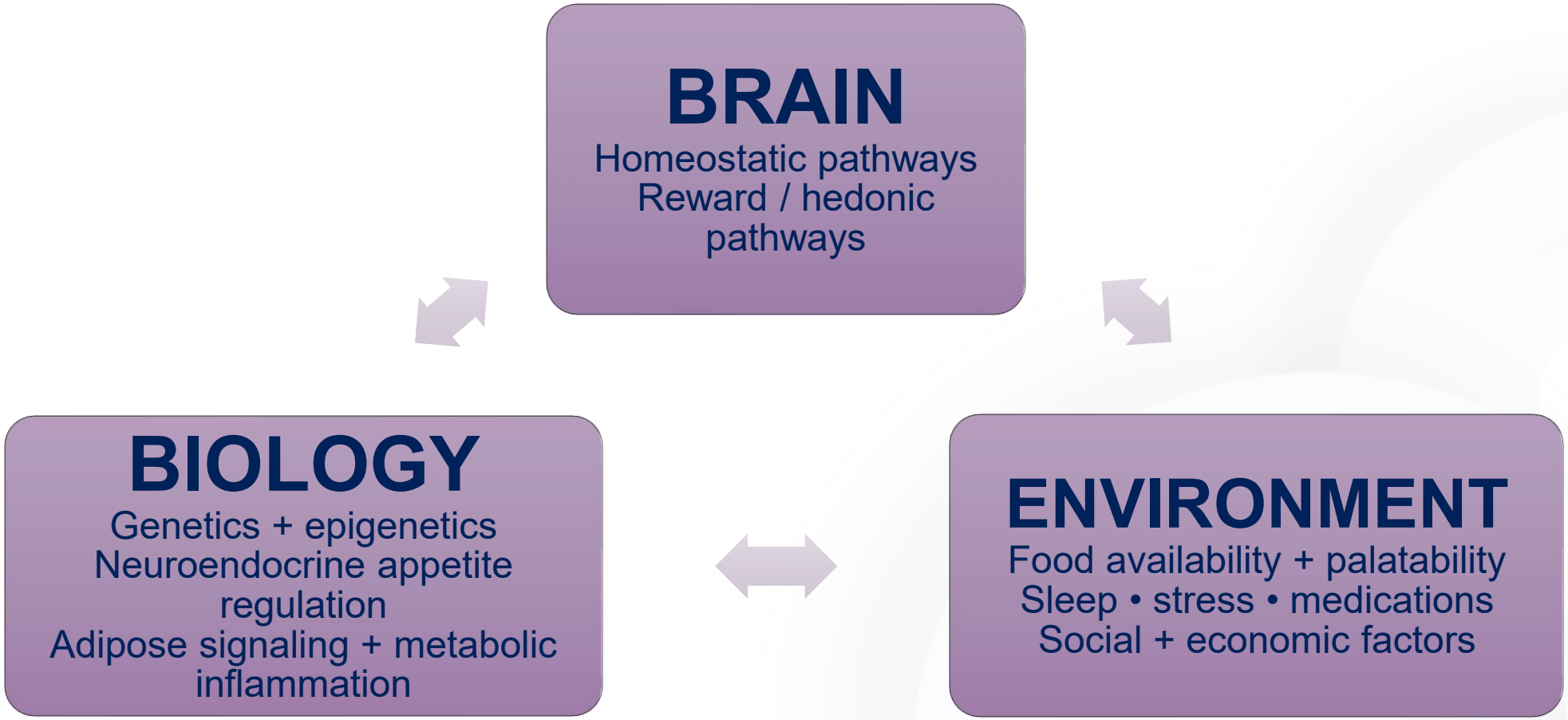
Normal Physiology: Energy intake is actively regulated

- Normal physiology integrates these signals so intake can match expenditure.
  - **Adipose tissue:** leptin, adiponectin
  - **GI tract:** ghrelin, CCK, GLP-1, PYY, oxyntomodulin
  - **Pancreas:** insulin, amylin, pancreatic polypeptide, glucagon
  - **Brain:** homeostatic eating, hedonic eating, executive function

In obesity, that regulatory system is altered



So, hunger, satiation, and food reward can feel different

Leptin signaling	• Normally communicates energy stores → obesity may involve impaired central signaling
Insulin signaling	• Central and peripheral resistance can disrupt energy regulation
Ghrelin + gut-derived signals	• Help govern hunger, satiation, satiety and meal initiation/ termination

What does that biology feel like to the patient?

- “I'm hungry again an hour after eating.”
- “I think about food all day.”
- “Once I start eating, it's hard to stop.”
- “I've lost 40 pounds three different times and always regained it.”
- “I know exactly what I'm supposed to eat. I just can’t do it.”

Using the 5 As of obesity management

1 Ask permission

- *"Would it be okay if we talk about how your weight and health might be connected?"*
- *"Is now a good time for us to discuss how your weight may be affecting your health? "*

Asking permission

- Shows compassion and empathy
- Invites the patient into their care

2 Assess their history

- Weight/diet history
- Sleep/stress
- Goals that matter to the patient
- Obesity classification (BMI and waist circumference)
- Disease severity and staging

3 Advise on treatment options

- Nutrition therapy
- Physical Activity
- Behavior Modification
- Medical/surgical Interventions

4 Agree on goals

Use shared-decision making to form a personalized, sustainable plan

5 Assist with challenges and barriers

- SDOH
- access to healthy food

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ASSESS: What could change my prescription?

HISTORY

Previous weight interventions

GI/renal/bone conditions

Medications

NUTRITION

Meal/snack pattern/ quality

Emotional eating

Eating-disorder risk

Bowel pattern

Allergies/intolerances/preferences

FUNCTION

Activity

Muscle strength

Sarcopenia risk

CONTEXT

Food access

Health literacy

Sleep/Stress

Social support

Counseling should begin with curiosity, not prescription

> “How’s your diet?”

Best practice: *Walk me through a usual day of eating. Where do you feel like things go well, and where does it get harder?”*

Avoid: “What's your diet like?”

Open-ended questions help us understand what the patient has already learned about themselves: what worked, what didn’t, what felt realistic, and what didn’t.

How you ask determines what you learn

> “Have you tried to lose weight before?”

Best practice: *“Tell me what you've tried before. What felt doable? What became hard to sustain?”*

Avoid: “What's your weight history?”

Better questions give you better clinical information.

Assess Readiness and Confidence

Readiness

- Is this something the patient wants to work on now?
- Are they considering change, preparing, or already acting?

Self-efficacy

- How confident are they that they can do it?
- What has helped or gotten in the way before?

Match the counseling

- Earlier readiness → curiosity, MI, explore ambivalence
- Ready to act → skills, planning, self-monitoring, problem-solving

ASSESS: If treatment works, what do you hope is different?

- **Clinical**
  - A1c
  - BP
  - Sleep apnea
  - Fertility
- **Function**
  - Mobility
  - Pain
  - Endurance
  - Strength
- **Lived Experience**
  - Fit of clothing
  - Mental acuity/sharpness
  - Ability to do things you couldn't do before
  - Coping skills or emotional awareness
  - Happiness/enjoyment
  - Social engagement



"What can we track beyond your weight?"

What happens if we prescribe too soon?

- Existing constipation → medication may worsen bowel habits
- Low protein + poor strength → active weight loss may amplify muscle/function risk
- Binge-eating disorder → changes treatment and referral needs.
- Food insecurity → “Mediterranean diet” advice may be inaccessible
- History of severe restriction → another rigid calorie prescription may reinforce the same unsuccessful cycle

PHASE 1 PIVOT

- FROM: “What diet should I prescribe?”
- TO: “What do I need to understand before I prescribe?”

biology • goals • readiness • history • function • context

PHASE 2: INITIATION + ACTIVE WEIGHT LOSS

Create an effective nutrition strategy.

Education Should Be *Preemptive*

APPETITE + EATING	• Hunger becomes much quieter • Fullness may come sooner • Preferences may change • Eating patterns may need to become more intentional
TOLERANCE	• Nausea, constipation, diarrhea, reflux may occur • Symptoms occur at initiation or dose escalation • Know when symptoms need reassessment
WEIGHT RESPONSE	• Weight loss can be rapid, gradual, or minimal • Response varies between patients • A slower response, or even nonresponse, does not mean the patient has failed

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INITIATION / ACTIVE LOSS — Week 8

“This is amazing. I barely think about food anymore.”

Lost 8 lbs| eating 1–2x/day | little hunger | protein ~45 g/day

Obesity Medications target the biology driving intake

- **Hypothalamus / appetite regulation**
  - **Phentermine/topiramate:** ↓ appetite / ↑ satiety
  - **Naltrexone/bupropion:** appetite + food-cue response ↓
- **Gut–brain / incretin pathways**
  - **Liraglutide + semaglutide:** GLP-1 receptor agonism → central appetite suppression plus peripheral effects on gastric emptying and glucose regulation
  - **Tirzepatide:** dual GIP/GLP-1 receptor agonism with central effects on weight regulation
- **Melanocortin pathway**
  - **Setmelanotide:** MC4R agonism → appetite and energy-balance regulation in specific genetic forms of obesity
- **GI tract**
  - **Orlistat:** pancreatic lipase inhibition → ↓ fat absorption

Why incretin therapy changes eating so much

- **BRAIN**
  - **Hypothalamus:** GLP-1 signaling in appetite-regulating regions, including ARC/PVN
    - hunger ↓ • satiety ↑
  - **Reward circuitry:** VTA / nucleus accumbens and related pathways
    - food reward and motivation can change
  - **Brainstem + vagal pathways:** Gut/vagal afferents → NTS → feeding-regulation circuits
    - satiation signaling
- **GI TRACT**
  - **Gastric emptying ↓**
    - earlier fullness / smaller meal tolerance
- **PANCREAS**
  - **Glucose-dependent insulin secretion ↑**
    - Glucagon secretion ↓

What does treatment feel like to the patient?

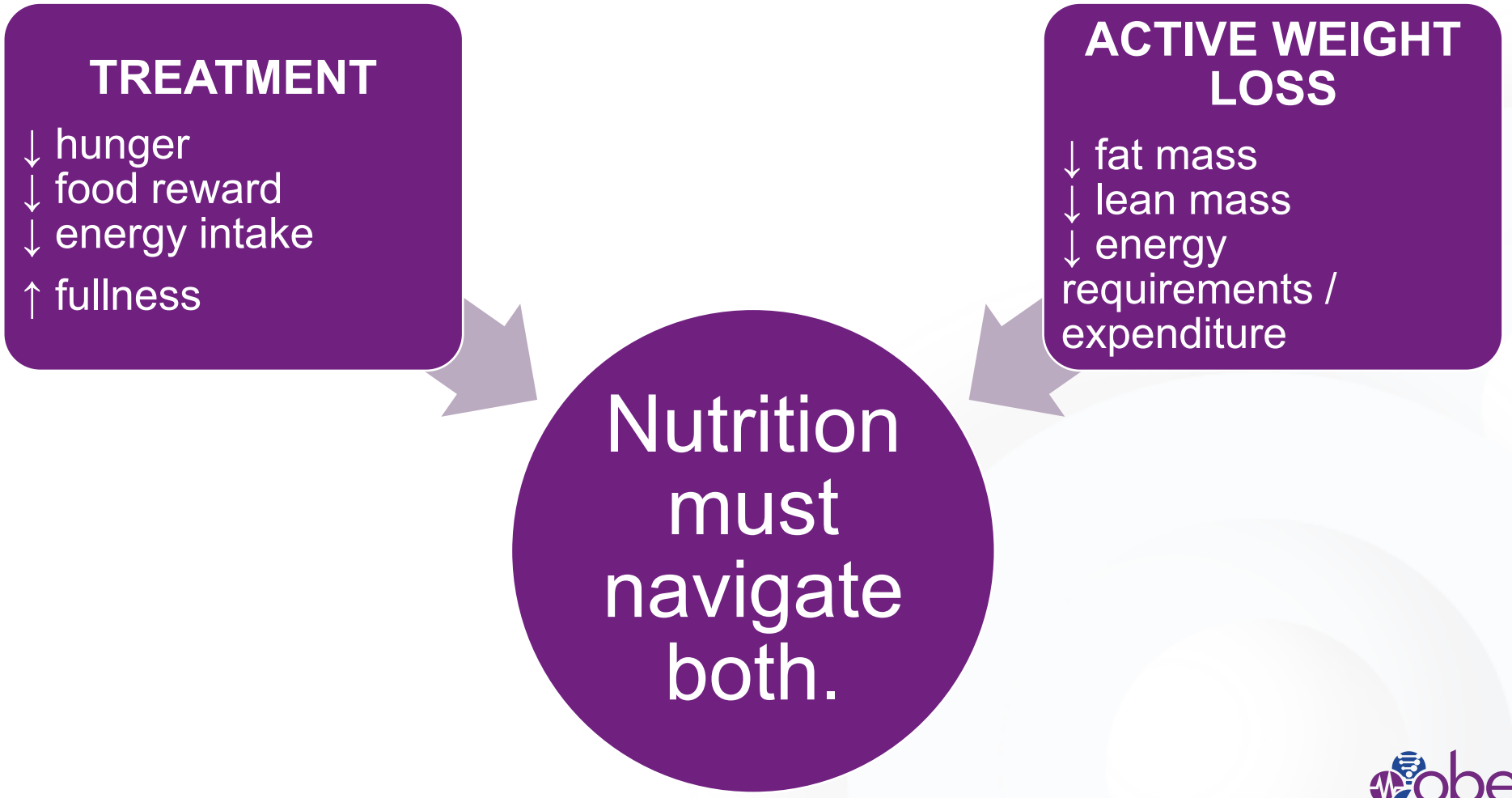
- “I’m just not hungry.”
- “I get full after a few bites.”
- “I barely think about food anymore.”
- “I looked up and realized I hadn’t eaten since breakfast.”

The scale can change faster than the skills.

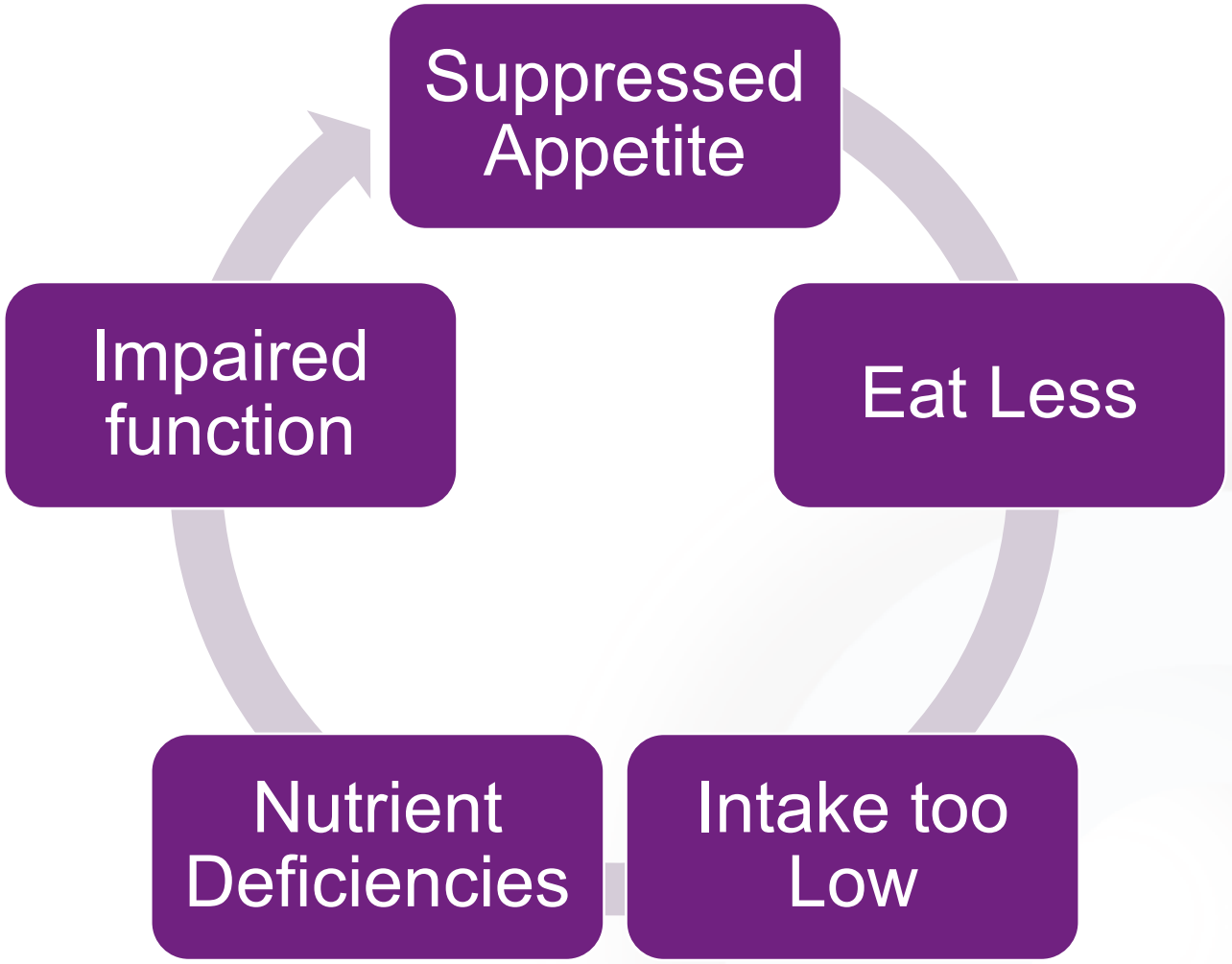
- Less hunger doesn’t automatically create structure, skills, or self-efficacy.
- If behavior change has not occurred, skills, confidence, and habits may not have developed alongside the physical change.

Maintenance starts here.

Two forces are acting at once



What Happens If We Don't Adapt?



Is there a “best” diet?

- No single macronutrient pattern wins.
- Evidence-supported options can include:
  - Mediterranean
  - DASH
  - lower-carbohydrate
  - lower-fat
  - structured meal replacements

What matters more?

- adherence

Dietary plan should include:

- Eating behaviors and meal patterns
- Cultural influences
- Food availability and financial limitations
- Time constraints
- Nutritional knowledge
- Cooking skills
- Comorbidities
- Family dynamic
- Work demands/schedule

How much energy restriction?

- **Lifestyle-only treatment**
  - Traditional guideline target: **~500–750 kcal/day energy deficit**
- **Medication-assisted weight loss**
  - Don't automatically stack another prescribed deficit on top of profound appetite suppression. Instead assess:
    - actual intake
    - rate of loss
    - hunger/fullness
    - nutrition adequacy
    - strength/function

Nutrition Recommendations

Nutrient	Recommendation	Sources
Fluid	>2–3 L/d	• Water, Low-calorie beverages (e.g., tea, coffee), low-fat milk, soy milk) • Limit sugar-sweetened beverages
Energy	• 1200–1500 kcal/d for most women • 1500–1800 kcal/d for most men	A healthy dietary pattern emphasizing vegetables, fruits, whole grains, lean protein foods, low-fat dairy or dairy alternatives, and healthy fats
Fiber	• 21–25 g/d for women • 30–38 g/d for men	• Whole grains, Vegetables, Beans, peas, and lentils, Fruits, Nuts and seeds, Supplement when needed
Protein	1.2 -1.6g/kg/day	• Beans, peas, and lentils, Nuts, seeds, and soy products, Seafood • Lean meat, poultry, low-fat dairy foods, and eggs
Carbohydrates	• 45%–65% of energy intake (~135–245 g/d for a 1200–1500-kcal/d diet) • RDA is 130 g/d	• Whole grains • Fruits • Vegetables • Nuts and seeds
Fat	• 20%–35% of energy intake (~27–58 g/d for a 1200–1500-kcal/d diet) • Limit saturated fat to <10% of energy intake	• Nuts and seeds • Avocado • Vegetable oils (limit palm and coconut oil)

Protein

What We Know

- **RDA:** 0.8 g/kg/day
- **Proposed during active weight reduction:** 1.2–1.6 g/kg/day

What We Don't Know

- **Which denominator is best?**
  - Actual weight?
  - *Ideal/adjusted weight?*
  - Fat-free mass?

There is no consensus.

Protein Counseling Tips

- Give a realistic target:
  - 80–120 g/day
  - Start where the patient is and increase slowly from there
  - 20-40 grams per meal, spread throughout the day
  - Use foods they enjoy and tolerate

How the plate evolves

Build the plate around 4 things

1. **Protein** — high-quality
2. **Color** — fruit/vegetable
3. **Fiber-rich carbohydrate** — beans, whole grains, starchy vegetables
4. **Fat** — nuts, seeds, avocado, olive oil, etc.

Plate Check: What needs to change now?

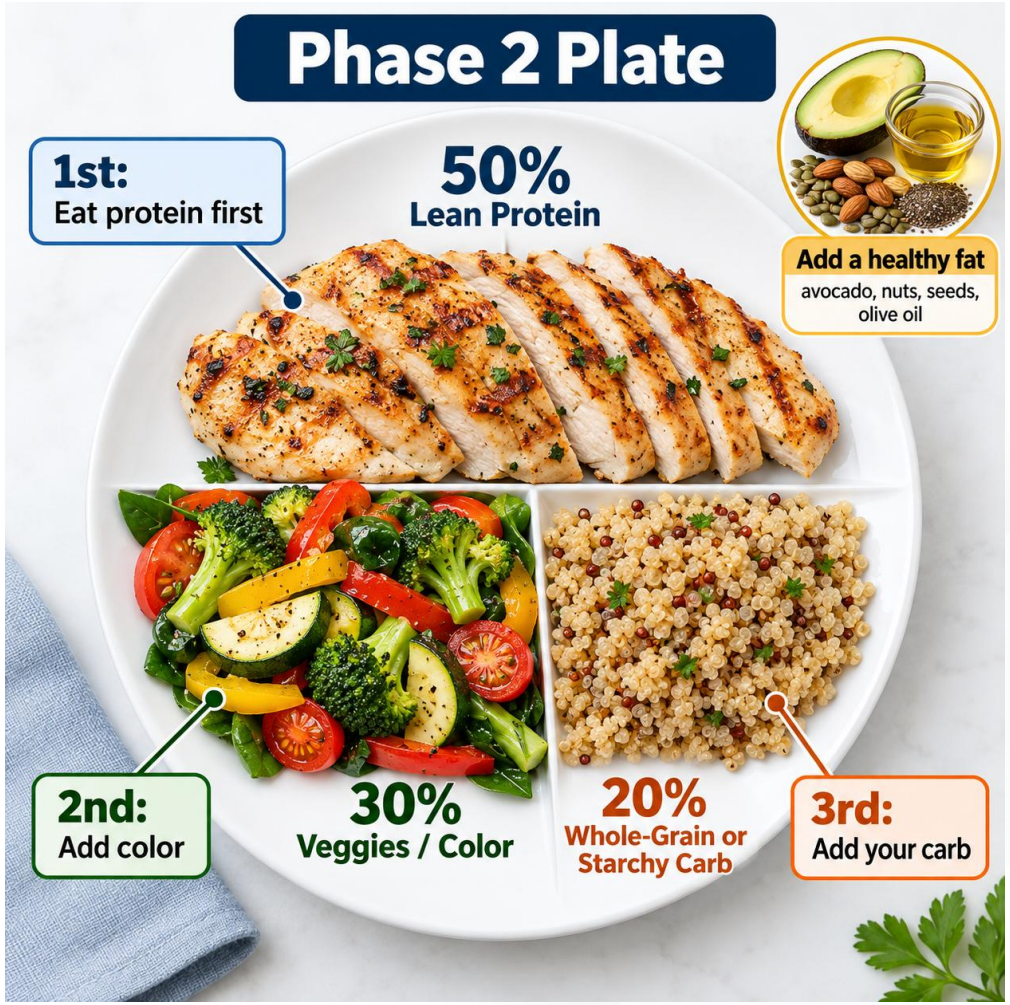


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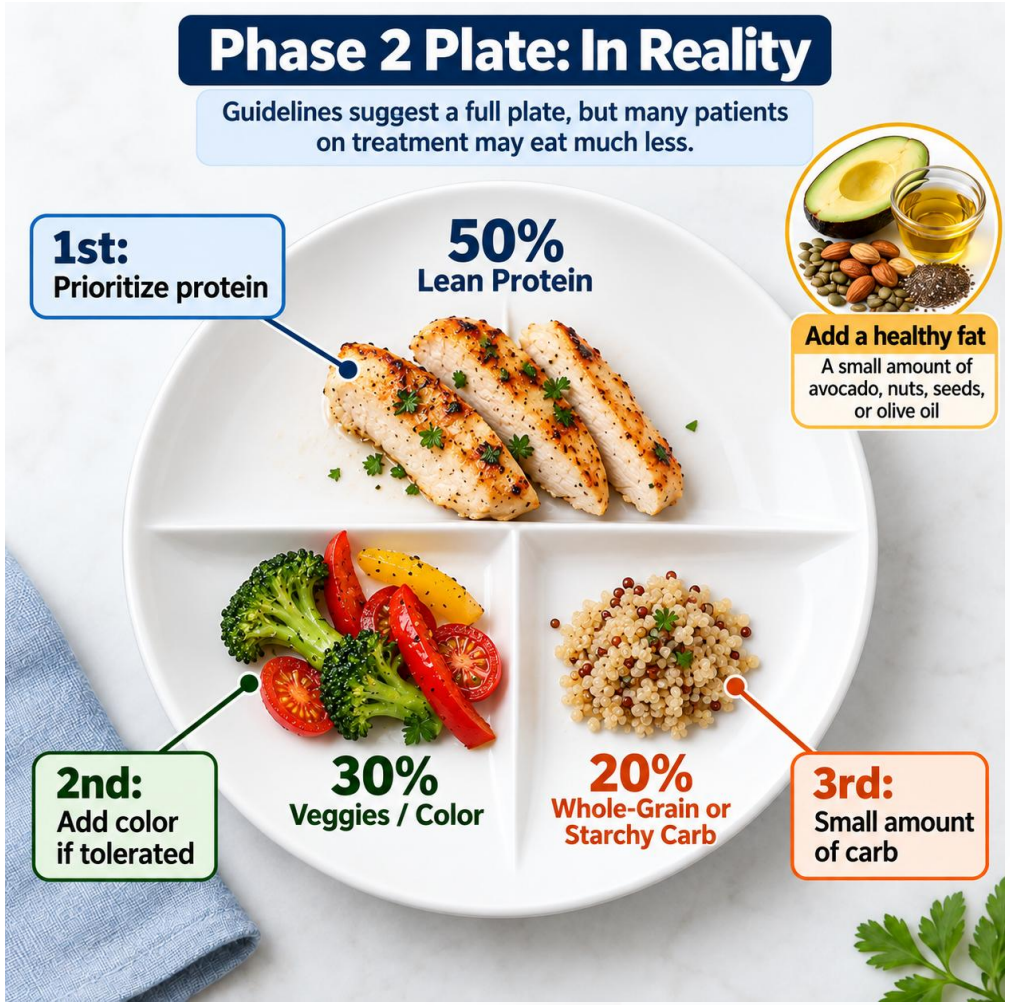
Plate Check: In Reality



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Don't let appetite suppression become accidental under-fueling

- **Build eating opportunities**
  - eat regularly even when hunger is quiet
  - split intake if necessary
  - use reminders when helpful
- **Lower the friction**
  - Greek yogurt • tuna • eggs • edamame • canned beans • microwave grains • frozen vegetables • pre-cut fruit • nuts • avocado • olive oil

Convenience is a nutrition strategy.

What should we monitor during active weight loss?

Trajectory

- Rate of weight loss
- Weight trend
- Waist/body composition when useful

Nutrition

- Total intake
- Protein adequacy
- Fluid intake
- Dietary variety / nutrient density
- Fiber / bowel pattern

Function

- Strength
- Physical function
- Resistance training
- Fatigue / energy

Clinical response

- Blood pressure
- Glycemia/A1c if relevant
- Other obesity-related complications being treated

Labs when indicated

- Renal function
- Electrolytes/CMP
- Micronutrients when intake is low or deficiency risk is present

PHASE 2 PIVOT

- FROM: “How do we create more restriction?”
- TO: “How do we protect nutrition inside the deficit?”

STRUCTURE • ADEQUACY • MUSCLE/FUNCTION

PHASE 3: TITRATION + TREATMENT ADJUSTMENT

Adapt when physiology and tolerance change.

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TITRATION — Week 16

“I know I need to eat, but everything sounds awful.”

dose increased | nausea | constipation | early satiety | fluid intake ↓

Why dose escalation changes tolerance

- **GLP-1–based therapies can:**
  - delay gastric emptying → fullness, bloating, nausea
  - activate central pathways involved in appetite and nausea
  - alter intestinal motility/secretions → diarrhea or constipation
- **GI effects are most common during initiation + dose escalation**
  - and often decrease after a period on a stable dose.

Gastric emptying is not the whole story

- **EARLY / AFTER ESCALATION**
  - Gastric emptying ↓
  - Fullness / nausea / smaller meal tolerance ↑
- **WITH CONTINUED EXPOSURE**
  - The gastric-emptying effect may attenuate (**tachyphylaxis**) BUT
- **Central appetite effects can persist**

What does escalation feel like to the patient?

- “I’m full after a few bites.”
- “Nothing sounds good.”
- “I feel so nauseous.”
- “I keep skipping meals without meaning to.”
- “I’m constipated and drinking less.”
- “I know I need to eat, but I just can’t get much in.”

Good advice. Wrong phase.

- “Eat more fiber.”
- “Prioritize protein.”
- “Eat high-volume foods.”
- “Just listen to your hunger.”

Symptom-guided nutrition

Patient experience	Nutrition adjustment
Nausea / early satiety	Smaller, more frequent eating opportunities; reduce large/high-fat meals; ginger or peppermint tea; separate fluid from meals
Vomiting	Smaller volume; prioritize fluids; assess dehydration
Constipation	Fluids first; add fiber gradually based on tolerance
Diarrhea / reflux	Chew food thoroughly, avoid large/high-fat meals; minimize alcohol; maintain hydration
Food aversion	Use tolerable alternatives; softer/liquid options when needed

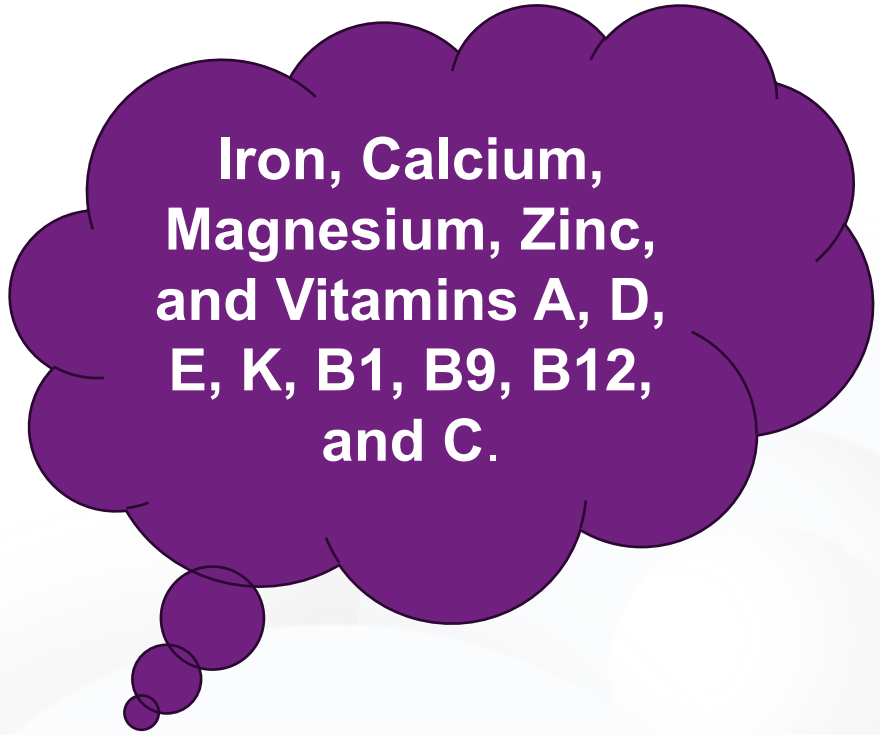
Plate Check



AI-generated image.

Red flags in this phase

- rapidly accelerating weight loss
- very low total intake
- inability to meet protein needs
- declining dietary variety
- persistent dehydration
- fatigue beyond expected levels
- muscle weakness / declining function
- excessive hair loss
- poor wound healing / unusual bruising



Slower Schedules Are Allowed

- Tolerance is part of treatment response.
- Remain at a dose longer when needed for tolerability
- Escalation can be slowed or paused
- Some clinicians use the lowest effective dose and escalate only if efficacy wanes or weight reduction stops

Phase 3 Pivot

- FROM: “How do I keep escalating the dose?”
- TO: “How does the plan need to change when tolerance changes?”

TOLERANCE • HYDRATION • ADEQUACY • FUNCTION

Phase 4: MAINTENANCE + TRANSITION

Plan for the biology of long-term treatment.

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MAINTENANCE — Month 18

“I’m hungrier again. Does that mean I’m failing?”

Weight loss slowed | appetite returning | strength improved | A1c normalized

Maintenance can occur in two environments

ON treatment

Appetite suppression may persist
Food noise may remain quieter
Portions may remain smaller

Nutrition focus:
adequacy
structure
muscle
dietary flexibility

OFF/Slowing Treatment

Hunger may increase
Food noise/cravings may return
Portions may naturally increase
Weight recurrence risk increases

Nutrition focus:
plan before stopping
satiety-promoting meals
regular eating structure
coping strategies/support

Biologic pressure toward regain

DRIVE TO EAT ↑

- **Brain + appetite signaling**
  - ARC / brainstem circuitry shifts toward **greater hunger + less satiety**
  - **Leptin ↓**
  - **Ghrelin ↑**
  - Satiety-related signals may fall: **GLP-1 ↓ • PYY ↓ • insulin ↓**
  - Reward-related pathways can increase the motivational pull of food

ENERGY EXPENDITURE ↓

- **Metabolic adaptation**
  - Resting metabolic rate ↓
  - 24-hour energy expenditure ↓
  - Expenditure may fall more than expected from the loss of body mass alone
  - Reduced lean mass can further affect energy needs and function

What does maintenance feel like to the patient?

- “I don't trust myself anymore.”
- “How do I know if I'm actually hungry?”
- “The food noise is back. Am I losing control?”
- “Everyone keeps congratulating me. Why do I feel weird about it?”
- “Food used to be such a big part of my life. I’m still figuring out what that looks like now.”

The Maintenance Plate

SATIETY	STRUCTURE	STICKABILITY
• Protein + fiber • Fruits + veggies • Whole grains / legumes • Water-rich foods	• Regular meals • Mini-meals • Avoid over-hunger • Plan for predictable triggers	• Foods they enjoy • Cultural foods • Convenience • Flexibility • Pleasure • Crunchy foods

Movement has a different job now

- **Not:** burn more calories
- **Instead:**
  - preserve function
  - build strength
  - Protect muscle and bone
  - reduce pain / improve mobility
  - support metabolic health
  - build confidence
  - support quality of life

- *What has movement felt like for you lately?*
- *What feels doable right now?*
- *How could movement help you feel better this week?*

Rebuild Trust With Structure

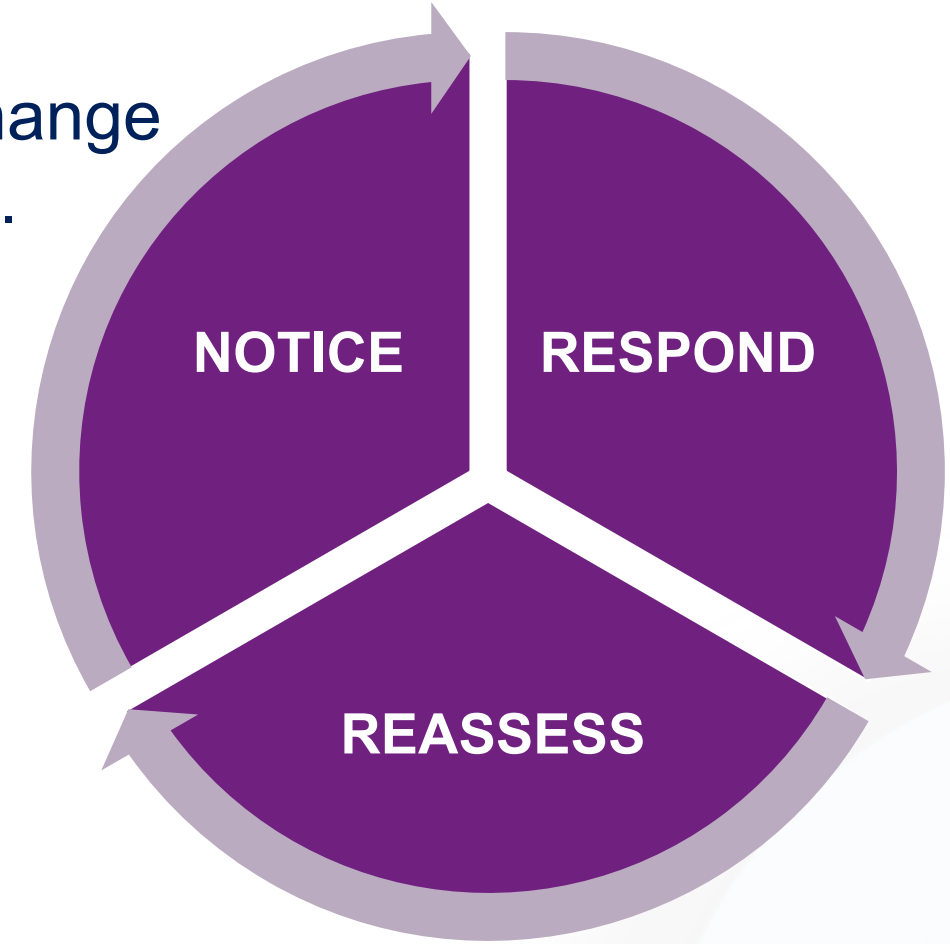
- Eat regularly enough to avoid extremes
- Check in: How hungry am I? How full am I?
- Ask: What kind of hunger is this?
  - physical?
  - emotional?
  - environmental/cue-driven?
- Notice patterns without immediately trying to “fix” them

Awareness + curiosity > judgment

Expect setbacks before they happen

- Ask the patient "*What will you do when…*"
  - hunger increases?
  - food noise returns?
  - emotional eating shows up again?
  - your weight fluctuates?
  - exercise drops off?
  - life gets chaotic?
  - medication access changes?

Identify the change without panic.



Return to structure, satiety, movement.

Does nutrition need adjustment?
Does medication need reassessment?
Do we need other support?

What's your long-term game plan?

Before maintenance feels "routine," the patient should be able to answer:

1. What am I trying to maintain?
2. What does my default eating pattern look like?
3. How am I protecting muscle?
4. What are my early warning signs?
5. How will I respond if hunger, food noise, or weight starts to change?

Phase 4 Pivot

- FROM: “How do I keep the weight off?”
- TO: “How do we preserve health gains when hunger and food noise change?”

SUSTAINABILITY • STRENGTH • FLEXIBILITY • RELAPSE PLANNING

Same patient. Different phase. Different plate.

1. **Pre-treatment:** Know what and who you're treating.
2. **Initiation + Active Weight Loss:** Create an effective nutrition strategy.
3. **Titration + Treatment Adjustment:** Adapt when physiology and tolerance change.
4. **Maintenance + Transition:** Plan for the biology of long-term treatment.

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