Academy of Nutrition and Dietetics

Obesity Medications, Nutrition, and Women's Metabolic Health Across the Lifespan

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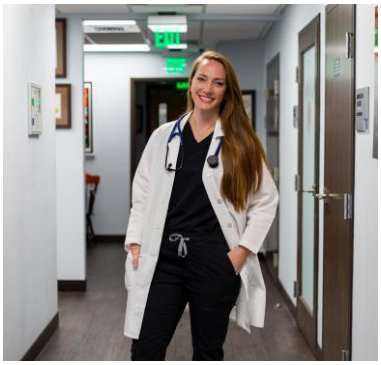
Today's Speakers

Dr. Basma Faris, MD, FACOG, CCMS

Colleen Sloan, PA-C, RDN



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Disclosures

Colleen Sloan
- Nothing to Disclose

Basma Faris
- Nothing to Disclose

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Learning Objectives

1. Explain how GLP-1–based therapies may affect hormonal regulation, metabolic health and fertility outcomes.
2. Differentiate between evidence-based uses of obesity medications and common misconceptions about their role in women's health.
3. Identify patient-centered nutrition care strategies that consider life stage and individual goals for women using obesity pharmacotherapy with a disordered eating–informed lens.

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When talking to women about their bodies …

- Our bodies are meant to change based on the season we're in
- Transitions are hard
- Encourage body neutrality
- Praise for what our bodies can/have done

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Things that contribute to weight gain

- Genetics
- Hormones
- Motherhood
- Smoking
- Stress
- Age
- BLT effect
- Sleep issues
- Less physically active with age, causing abdominal weight gain
- Daytime restriction leads to nighttime bingeing

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GLP-1 Overview

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Indications and Evidence for GLP-1 use

FDA BMI thresholds for prior authorization: **BMI 30+ or BMI 27+ with comorbidity**

- Hypertension
- Type 2 diabetes mellitus
- Dyslipidemia
- Cardiovascular disease
- Obstructive sleep apnea

- Zepbound: moderate-to-severe obstructive sleep apnea (OSA) in adults with obesity
- Wegovy injection and pill: cardiovascular risk reduction in adults with established cardiovascular disease and obesity/overweight
- Wegovy injection: MASH with moderate-to-advanced fibrosis

Important: even with secondary indications, coverage may still be restricted

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How GLP-1s Work

- Incretin-based therapies reduce appetite, increase satiety, improve insulin sensitivity and change reward-driven eating
- Activate the GLP-1 receptors located in the hypothalamus in the brain
  - Decreases the feeling of hunger
  - Decrease food noise

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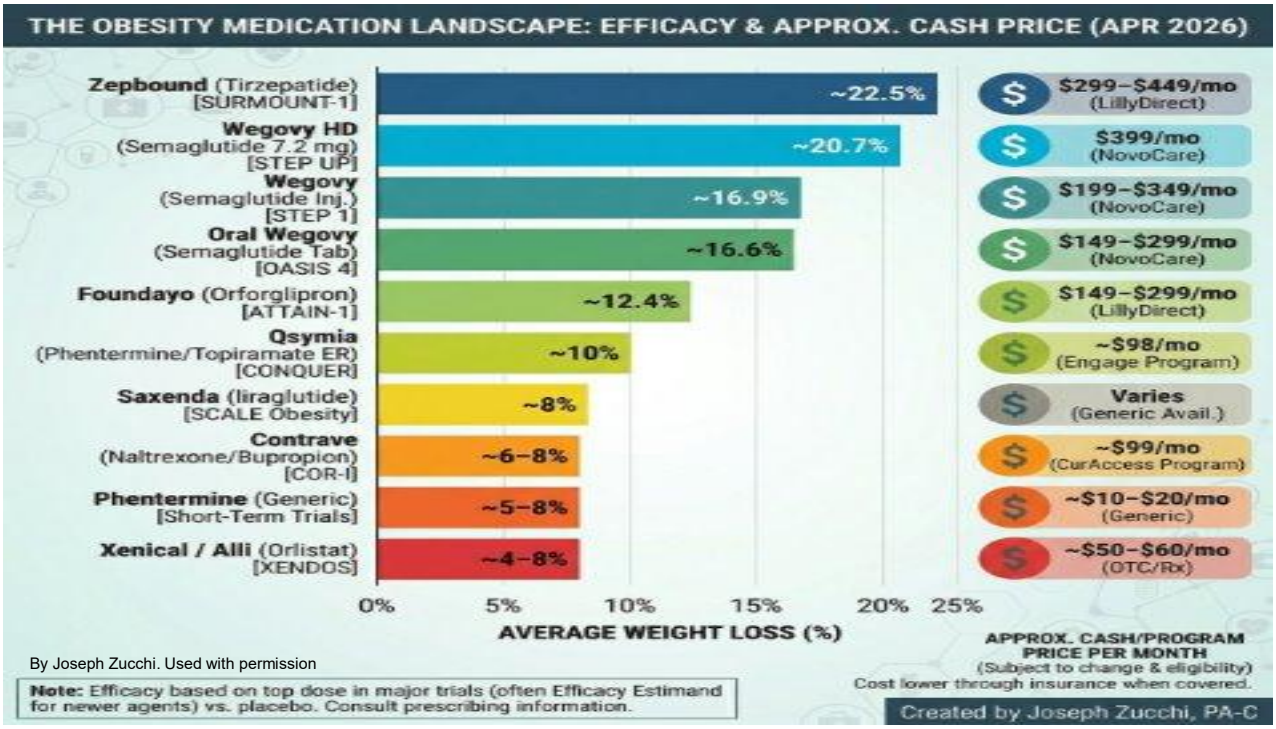

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Micro-dosing

- Some individuals use microdosing, spaced-out dosing, or lower compounded dosing of GLP-1s, motivated by cost, GI tolerability, drug shortages, and personal preferences.
- No major medical society currently endorses or provides formal guidelines for microdosing indications
  - All existing guidelines recommend standard dose titration to the approved maintenance dose
  - off-label use can lead to dosing errors and reduced efficacy
- Structured dose de-escalation (e.g., biweekly dosing) after achieving weight plateau is an emerging concept with preliminary support but lacks randomized trial validation.

https://www.sciencedirect.com/science/article/pii/S2667368125000257

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Compounded Medication

The ADA issued a formal statement recommending against non-FDA-approved compounded GLP-1 RA products due to concerns about variable potency, contamination, dosing errors, and serious adverse events.

Neumiller, J, Et al. Compounded GLP-1 and Dual GIP/GLP-1 Receptor Agonists: A Statement from the American Diabetes Association. *Diabetes Care* 22 January 2025; 48 (2): 177–181. https://doi.org/10.2337/dci24-0091

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Patient Concerns: Bone Health

- Women gradually lose bone mass after age 30
- Most bone tissue loss occurs in the first five (5) years after menopause, then slows
- Promote adequate calories and plant-forward eating with protein at each meal
- Nutrients to focus on: Calcium, Vitamin D, but also Magnesium, and Potassium
- Weight-bearing exercises
  - The joint advisory from the Obesity Society, American College of Lifestyle Medicine, and others recommends **strength training at least 3 times weekly**
  - Resistance training in caloric restriction studies has been shown to **reduce lean body mass loss by 50–95%** and preserve bone density.

Mehrtash F, Dushay J, Manson JE. Integrating Diet and Physical Activity When Prescribing GLP-1s—Lifestyle Factors Remain Crucial. *JAMA Intern Med.* 2025;185(9):1151–1152. doi:10.1001/jamainternmed.2025.1794

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Patient Concerns: Muscle Loss

"Ozempic face"

- Nutrition Strategies to promote strength
- Exercise recommendations
  - Increase gradually
  - **≥150 minutes/week of moderate-intensity aerobic activity** (e.g., brisk walking, cycling, swimming), spread over ≥3 days/week with no more than 2 consecutive days without activity.
  - Alternatively, **≥75 minutes/week of vigorous-intensity activity** or interval training may suffice for more fit individuals
  - For **weight maintenance** after initial weight loss, higher volumes of **200–300 minutes/week** of moderate-intensity aerobic exercise are recommended.
- Monitoring:
  - **Functional monitoring** with grip strength testing, 5-sit-to-stand tests, or 6-minute walk tests should be incorporated at visits to detect early muscle function decline.

Kanaley JA, Colberg SR, Corcoran MH, et al. Exercise/Physical Activity in Individuals with Type 2 Diabetes: A Consensus Statement from the American College of Sports Medicine. *Med Sci Sports Exerc.* 2022;54(2):353-368. doi:10.1249/MSS.0000000000002800

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Nutrition Goals and GLP-1s

- Calories: 1200-1500 kcal/day
- Protein: 1.2-1.6 g/kg/day
  - Actual vs IBW: Joint Advisory: acknowledges that it is *"unclear whether these goals should be based on actual body weight, corrected (adjusted or ideal) body weight, or fat-free mass."*
  - Aim for 25-30 grams per meal or 80-120g/day
  - Increase slowly
- Carbohydrates: 135-245 g/day
  - Limit added sugars to <10%
- Fat: 25-60 g/day
  - <10% saturated fat
- Fiber: 21-25 g/day
- Fluids: 2-3 liters
- Supplementation: should be individualized
  - Consider a multivitamin/mineral supplement, calcium, and vitamin D
  - Creatine Monohydrate: no CPGs at this time, however *"may be beneficial"* for lean mass preservation when combined with strength training

Almandoz JP, et al. Nutritional considerations with antiobesity medications. Obesity. Published June 10, 2024.

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Patient Concerns: Side Effects

Most GI AEs with semaglutide were:

- non-serious (99.5% of AEs)
- mild-to-moderate (98.1%)
- transient and occurred most frequently during/shortly after dose escalation

Side effect	Semaglutide 2.4 mg group (%)	Placebo group (%)	Tirzepatide 15 mg group (%)	Placebo group (%)
Nausea	44	16	28	8
Diarrhea	30	16	23	8
Vomiting	24	6	13	2
Constipation	24	11	11	5
Abdominal pain	20	10	10	5
Headache	14	10	-	-
Fatigue	11	5	7	3
Dyspepsia	9	3	10	4
Dizziness	8	4	4	2
Abdominal distension	7	5	4	2
Eructation	7	<1	5	1
Hypoglycemia[2]	6	2	-	-
Flatulence	6	4	4	2
Gastroenteritis	6	4	-	-
Gastroesophageal reflux	5	3	5	2
Gastritis	4	1	-	-
Hair loss	3	1	5	1

Ghusn W, Hurtado MD. *Obesity Pillars*. 2024.
Chart adapted from: Wan J, Ferrari C, Tadros M. *Gastroenterology Insights*. 2024;15:191-212.

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Patient Concerns: Side Effects Strategies

- Nausea: bland foods, smaller meals, avoid greasy/high fat
- Constipation: hydration, gradual fiber, movement
- Reflux: meal timing, chew food thoroughly, posture

Ghusn W, Hurtado MD. *Obesity Pillars*. 2024.

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Evidence and Safety Across the Lifespan

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Metabolic Health

GLP-1 RECEPTOR AGONISTS: EFFICACY IN WOMEN

- Meta-analysis of 64 RCTs: GLP-1 RAs produce greater weight loss in women than men (Alexander, 2026)
  - 10.9% vs 6.8%
  - Efficacy consistent across age, race/ethnicity, baseline BMI, and baseline HbA1c
  - Possible mechanisms for enhanced female response:
    - Synergistic interaction between GLP-1 RAs and estrogens
    - Lower median body weight → altered pharmacokinetics
    - Estradiol enhances the anorexic response to central GLP-1 signaling
  - Overall GLP-1 RA efficacy: weight reduction of ~4.6 kg (mean), BMI reduction of ~2.1 kg/m², waist circumference reduction of ~4.6 cm vs. placebo
  - Semaglutide 2.4 mg: up to ~14% weight loss; Tirzepatide 15 mg: up to ~18% weight loss

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Hormonal Regulation

GLP-1 AND ESTROGEN: CONVERGING PATHWAYS

- GLP-1 RAs and estrogen share overlapping metabolic effects on liver, CNS, and adipose tissue via converging protein kinase pathways
- Estradiol directly stimulates GLP-1 secretion from both pancreatic α-cells and intestinal L-cells via ERβ activation (Handgraaf, 2018)
- Estradiol modulates the anorexic response to central GLP-1 — enhancing satiety signaling in the hypothalamus (PVN) and hindbrain (Maske, 2017)

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GLP-1 RA and PCOS/PMOS

Metabolic outcomes (Forslund, 2026),(Jensterle, 2026)(Lu, 2026):

- most studied are Liraglutide and Semaglutide, with studies on Tirzepatide ongoing
- BMI reduction: −1.38 to −2.42 kg/m² vs. control
- Waist circumference: −5.16 cm vs. placebo
- HOMA-IR: significant reduction
  - Indirect effect
- Triglycerides: −0.20 mmol/L vs. placebo
- Total testosterone: significant reduction (MD −1.33)
- SHBG: significant increase
- LH: significant reduction

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GLP-1 RAs AND REPRODUCTIVE OUTCOMES in PMOS

- Pilot RCT of Liraglutide(Salamun 2018)
  - n=28, obese PCOS women with prior poor IVF response):
  - Preconception liraglutide + metformin vs. metformin alone
  - VF pregnancy rate per embryo transfer: 85.7% vs. 28.6% (P = 0.03)
  - Cumulative pregnancy rate over 12 months: 69.2% vs. 35.7%
  - No differences in oocyte yield, embryo number, blastulation rate, or stimulation parameters
  - Improved outcomes attributed to greater reductions in HOMA-IR, glucose tolerance, and SHBG — NOT ovarian response
  - Despite similar weight loss between groups → suggesting benefits beyond weight reduction
- Metformin vs Metformin + Semaglutide (Chen, 2025)
  - From weeks 16 to 40, the M+S group demonstrated a significantly higher natural pregnancy rate than the MET group (35% vs. 15%, P < 0.05).

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Infertility

- BMI >27 kg/m²: relative risk of anovulatory infertility = 3.1 (95% CI 2.2–4.4) vs. normal-weight women
- Menstrual irregularity: 54% in women >175% ideal body weight vs. 19% in those <150%
- Even ovulatory women with obesity have reduced fecundity: 66.4% conceive within 12 months vs. 81.4% of normal-weight women
- Mechanisms of obesity-related subfertility:
  - Hyperinsulinemia → suppressed SHBG → altered gonadotropin secretion
  - Increased adipose aromatase → excess estrogen
  - Elevated adipokines → direct ovarian inhibition
  - Lipotoxicity in the follicular environment → impaired oocyte quality
  - Chronic low-grade inflammation → impaired endometrial receptivity and decidualization

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Obesity And IVF Outcomes

- Meta-analysis of 33 IVF studies (47,967 cycles): obese women have significantly reduced clinical pregnancy (RR 0.90) and live birth rates (RR 0.84) vs. BMI <25 (Rittenberg, 2011)
- Systematic review (21 studies): obese women have 15% lower live birth rate following IVF (RR 0.85, 95% CI 0.82–0.87) (Bodetti, 2025)
  - BMI-dependent reduction in age-adjusted odds of live birth:
    - BMI 30.0–34.9: ↓37%
    - BMI 35.0–39.9: ↓61%
    - BMI ≥40.0: ↓68%
- Obesity impairs every step: higher gonadotropin requirements, fewer oocytes retrieved, lower implantation rates, higher miscarriage rates
- Altered follicular environment: elevated insulin, inflammatory markers, free fatty acids → abnormal cumulus-oocyte complexes

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Weight Loss Before IVF: What The Evidence Shows

2025 meta-analysis (12 RCTs, 1,921 women): pre-IVF weight loss interventions increase total pregnancy rates (RR 1.21, 95% CI 1.02–1.44) and unassisted conceptions (RR 1.47, 95% CI 1.26–1.73) (Michalopoulou, 2025)

- However, effect on IVF-specific live birth rate remains unclear (RR 1.15, 95% CI 0.95–1.40)
- ASRM Committee Opinion (2021): In anovulatory women with obesity, weight loss improves unassisted conception and ovulation rates; in ovulatory women, prepregnancy weight loss has NOT been shown to improve IVF live birth rates
- Weight loss ≥10% may be needed to significantly improve clinical pregnancy and live birth rates in IVF
- Most data we have on obesity treatment and IVF comes from PCOS population
- Key tension: benefits of weight loss must be balanced against declining fertility with advancing age — time spent losing weight = time lost to age-related fertility decline

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Pregnancy

- The FDA labeling for semaglutide (Wegovy/Ozempic)
  - based on animal reproduction studies, there may be potential risks to the fetus
  - Recommendation: discontinuation at least 2 months before a planned pregnancy due to its long half-life.
- The ADA Standards of Care (2026)
  - recommends discontinuation at least 2 months before planned pregnancy
  - The ADA emphasizes that a period of several months is usually needed to allow for drug elimination and insulin titration to achieve preconception glycemic goals.
- The current evidence remains **predominantly observational**.
  - Human data are increasingly reassuring that inadvertent periconceptional or early-pregnancy GLP-1 RA exposure does not appear to carry a consistent teratogenic signal.

- All guidelines continue to recommend discontinuation before pregnancy based on the precautionary principle, animal data, and the absence of randomized safety trials.

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Lactation

- Evidence on GLP-1 RA safety during lactation is extremely limited
  - One pharmacokinetic study of semaglutide in 8 lactating women found no detectable semaglutide transfer into human milk, with an estimated relative infant dose well below standard safety thresholds.
  - Animal studies have shown GLP-1 RA excretion in breast milk, but no human data on infant outcomes from breastfeeding exposure exist.

- The FDA label for Wegovy advises against breastfeeding during oral semaglutide treatment, though the injectable formulation label states that the developmental and health benefits of breastfeeding should be considered along with the clinical need for the drug.

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Weight Cycling in Reproductive Aged Women

WEIGHT CYCLING AND PREGNANCY RISK

- Definition: Repeated cycles of intentional weight loss followed by regain; estimated prevalence 20–55% in reproductive-aged women
- Key finding: ≥3 weight cycles associated with 6.2 kg greater gestational weight gain vs. no cycling history (dose-dependent, independent of prepregnancy BMI)
- Excessive gestational weight gain linked to macrosomia, gestational diabetes, gestational hypertension, and postpartum weight retention
- Clinical pearl: Ask about weight cycling history at initial prenatal visit to identify high-risk patients

LONG TERM CARDIOMETABOLIC CONSEQUENCES OF WEIGHT CYCLING

- ≥2 weight cycles of ≥10% body weight → increased risk of T2DM (HR 1.26), hypertension (HR 1.18); effects more pronounced in women (Kim, 2022)
- Weight cycling independently associated with ~30% increased risk of OSA, MASLD, T2DM and >50% increased risk of heart failure vs. weight-stable controls (Kakinami, 2020)
- Female weight cyclers show worse lipid profiles and insulin resistance (NHANES data)

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GLP-1 RA and the Preconception Dilemma

PRE-PREGNANCY WEIGHT CYCLING

- Weight regain after GLP-1RA/dual incretin discontinuation is rapid and substantial (~⅔ of lost weight regained within 1 year; mean regain ~9.7 kg) (West, 2026)
- Cardiometabolic improvements (HbA1c, BP, lipids) reverse in parallel with weight regain, projected to return to baseline within ~1–1.4 years
- Large retrospective study of GLP-1 RA use prior to pregnancy was associated with greater gestational weight gain and increase risk of adverse pregnancy outcomes ie preterm birth, GDM, pre-eclampsia (Maya, 2025)
- In another retrospective study of recent semaglutide therapy participants with semaglutide exposure in pregnancy experienced higher risks of excessive gestational weight gain, gestational diabetes, excessive fetal growth, and cesarean delivery, compared with non-users with overweight or obesity. (Yu, 2026)

  This evidence needs to be weighed against the known risks of elevated pre-pregnancy weight and excess gestational weight gain on pregnancy outcomes. **Prospective data is needed**.

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Menopause

OBESITY IN MIDLIFE

- Midlife women (ages 40–59): obesity prevalence ~42%, higher than younger women (20–39 yrs: ~34%)
- Obesity prevalence in US women peaks at ages 50–54 (~49%)
- Severe obesity (BMI ≥40) prevalence: 9.4% overall, higher in women than men across all age groups

WEIGHT GAIN ACROSS THE MENOPAUSAL TRANSITION

- Women gain an average of ~2.0–2.3 kg over 3 years during the menopausal transition — but this weight gain is primarily attributable to chronological aging, not menopausal status (Greendale, 2019)
- SWAN data: no difference in self-reported weight between premenopausal and postmenopausal women after adjustment for age
- Mean BMI in postmenopausal women increased from 28.7 kg/m² (1999) to 29.7 kg/m² (Ambikairajah, 2019)

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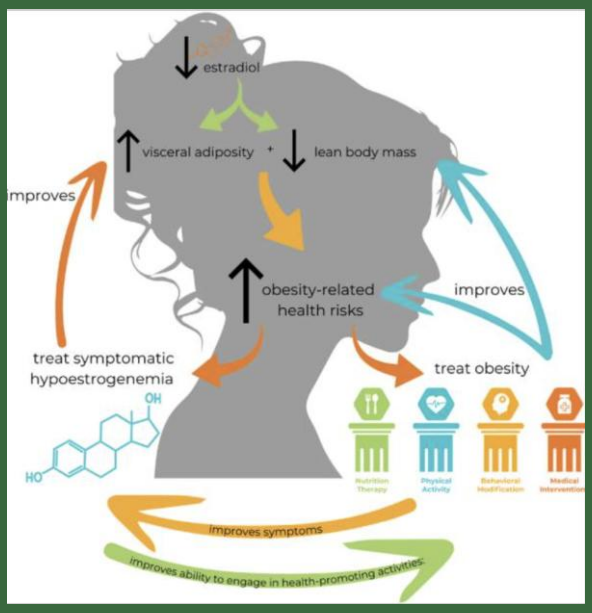
Body Composition And Menopause

AGE-RELATED vs. MENOPAUSE-RELATED

Key finding (SWAN, 18-year DXA data): ~2 years before the final menstrual period (FMP), the rate of fat gain doubled and lean mass declined, continuing until 2 years after FMP — suggesting a 4-year "critical window" of accelerated adverse body composition change that is menopause-specific. (Khoudary, 2026)

HORMONAL MECHANISMS DRIVING BODY COMPOSITION CHANGES (Younglove, 2026)

- Declining estradiol → loss of protective effect against central adiposity
- Rising androgen-to-estrogen ratio → enhanced central/visceral fat deposition
- Reduced energy expenditure parallels hormonal shifts
- Estrogen receptor alpha (ERα) plays a prominent role in fat accrual regulation
- FSH elevation linked to fat accumulation in animal models (less clear in humans)
- Decline in estrogen results → impaired satiety



Used with permission from author, (Younglove, 2026)

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GLP-1 RAs And MHT

INTERACTIONS WITH MENOPAUSAL HORMONE THERAPY (MHT)

- MHT does not cause weight gain (meta-analysis: mean difference 0.04 kg vs. placebo)
- MHT attenuates central fat redistribution: reduced visceral adipose tissue, android fat mass, and BMI in current users
- PEPI trial: women on CEE-based regimens gained ~1 kg less weight and ~1.2 cm less waist circumference vs. placebo over 3 years
- Benefits on body composition are NOT preserved after MHT discontinuation
- MHT cannot be recommended as a treatment for central obesity, but may favorably influence fat distribution
- GLP-1 RAs are more effective in women than men, potentially due to GLP-1–estrogen synergy
- MHT favorably influences fat distribution but does not prevent overall weight gain
- GLP-1 RAs may complement MHT by addressing both total weight and visceral adiposity
- When co-prescribing, consider transdermal estrogen to avoid potential oral absorption interference from GLP-1 RA-induced delayed gastric emptying

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Disordered Eating

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Eating Disorders

- Perimenopause and menopause may be particularly vulnerable times for individuals with a past or current history of eating disorders
- Central eating disorder symptoms in perimenopausal and early postmenopausal women **are weight dissatisfaction and a desire for thinness**
- A systematic review by **Vincent et al. (2024)** found potentially **higher levels of binge eating during perimenopause** and more restrictive eating behaviors during postmenopause compared to premenopause.

Vincent C, et al. Disordered eating behaviours during the menopausal transition: a systematic review. Appl Physiol Nutr Metab. 2024 Oct 1;49(10):1286-1308. doi: 10.1139/apnm-2023-0623. Epub 2024 Sep 4. PMID: 39229895.

Recommendations are fuzzy

The Joint Advisory recommends screening: all individuals should be screened for signs of binge eating disorder, anorexia nervosa, bulimia nervosa, and night eating disorder as part of the baseline assessment before starting GLP-1 therapy.

The US Preventive Services Task Force (2022) issued a Grade I statement (insufficient evidence) regarding screening for eating disorders in asymptomatic adolescents and adults with normal or high BMI

- Patients who screen positive or have a history of eating disorders should be referred to both an obesity medicine specialist and an eating disorders specialist prior to prescribing GLP-1 RAs
- Restrictive eating disorder is identified as a general contraindication to GLP-1 use

General Guidelines

- Screen for current and lifetime eating disorder symptoms before starting GLP-1RAs
- Stratify risk and consider specialist consultation when needed
- Monitor more than weight: meal regularity, restriction, purging, compulsive exercise, body checking, and distress about weight regain
- Use weight-stigma-informed communication and avoid praising weight loss alone
- Include people with lived experience in education, safety planning, and guideline development

https://onlinelibrary.wiley.com/doi/epdf/10.1002/eat.70145

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Screening Tools

SCOFF questionnaire

- Do you make yourself **Sick** because you feel uncomfortably full?
- Do you worry you have lost **Control** over how much you eat?
- Have you recently lost more than **One stone** (14 pounds or 6.35 kg) in a 3-month period?
- Do you believe yourself to be **Fat** when others say you are too thin?
- Would you say that **Food** dominates your life?

A **"yes" answer to two or more questions** suggests a likely case of an eating disorder and warrants further evaluation by a qualified health professional

Feltner C, Peat C, Reddy S, et al. Screening for Eating Disorders in Adolescents and Adults: Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2022;327(11):1068–1082. doi:10.1001/jama.2022.1807

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Screening Tools

Eating Disorder Screen for Primary Care (EDS-PC)

1. Are you satisfied with your eating patterns?
2. Do you ever eat in secret?
3. Does your weight affect the way you feel about yourself?
4. Have any members of your family suffered from an eating disorder?
5. Do you currently suffer with, or have you ever suffered from, an eating disorder?

An **affirmative answer to two or more questions** is considered a positive screen, indicating the need for further evaluation and possible treatment planning:

- consultation with a primary care provider, dietitian, or mental health professional

US Preventive Services Task Force. Screening for Eating Disorders in Adolescents and Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2022;327(11):1061–1067. doi:10.1001/jama.2022.1806

Gaps in Research and Looking to the Future

- No RCTs have been designed with menopausal status as a stratification variable or primary population of interest
- No data exist on the interaction between GLP-1 RAs and menopausal hormone therapy (MHT) in humans, despite preclinical evidence suggesting converging metabolic pathways
- The impact of GLP-1 RA-induced weight loss on vasomotor symptoms, lean mass preservation, and cardiovascular risk specifically in menopausal women has not been studied

Questions & Contact Us

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