Considerations for Body Composition, Physical Activity and Nutrition with the Use of Obesity Medications

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- Assistant Professor in Nutrition Sciences
- University of Pennsylvania School of Nursing

Welcome

Today's Moderators

Laura Russell, MA, RDN, CDCES

- Diabetes DPG Representative and Immediate Past Chair
- Endocrinology Clinic of Minneapolis

Beth Czerwony, MD, RDN, CSOWM, LDN

- Weight Management DPG Representative
- Cleveland Clinic

Three-Part Webinar Series

Obesity Medications and the RDN- Advance Your Knowledge, Enhance Your Role

April 17th
The Impact of Obesity Medications on Chronic Disease Management: From Research to Practice

May 8th
Considerations for Body Composition, Physical Activity and Nutrition with the Use of Obesity Medications

June 4th
Advance and Enhance the Unique Role of the RDN in Today's and Tomorrow's Obesity Care Continuum

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2024 Webinar Archives

2024 Webinar Series

Pathophysiology of Obesity and Treatment Using New Anti-Obesity Medications

The Role of the RDN to Optimize Short- and Long-term Use of Anti-Obesity Medications

Anti-Obesity Medications: An Interdisciplinary Panel Discusses Cases

Watch the 2024 Webinar Series recordings here:
https://www.eatrightpro.org/obesity-medication?_zs=ji0Fa&_zl=wxuR4

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Beth Czerwony, MS, RDN, CSOWM, LDN, Weight Management Dietetic Practice Group representative

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Disclosures
John Jakicic

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David Creel

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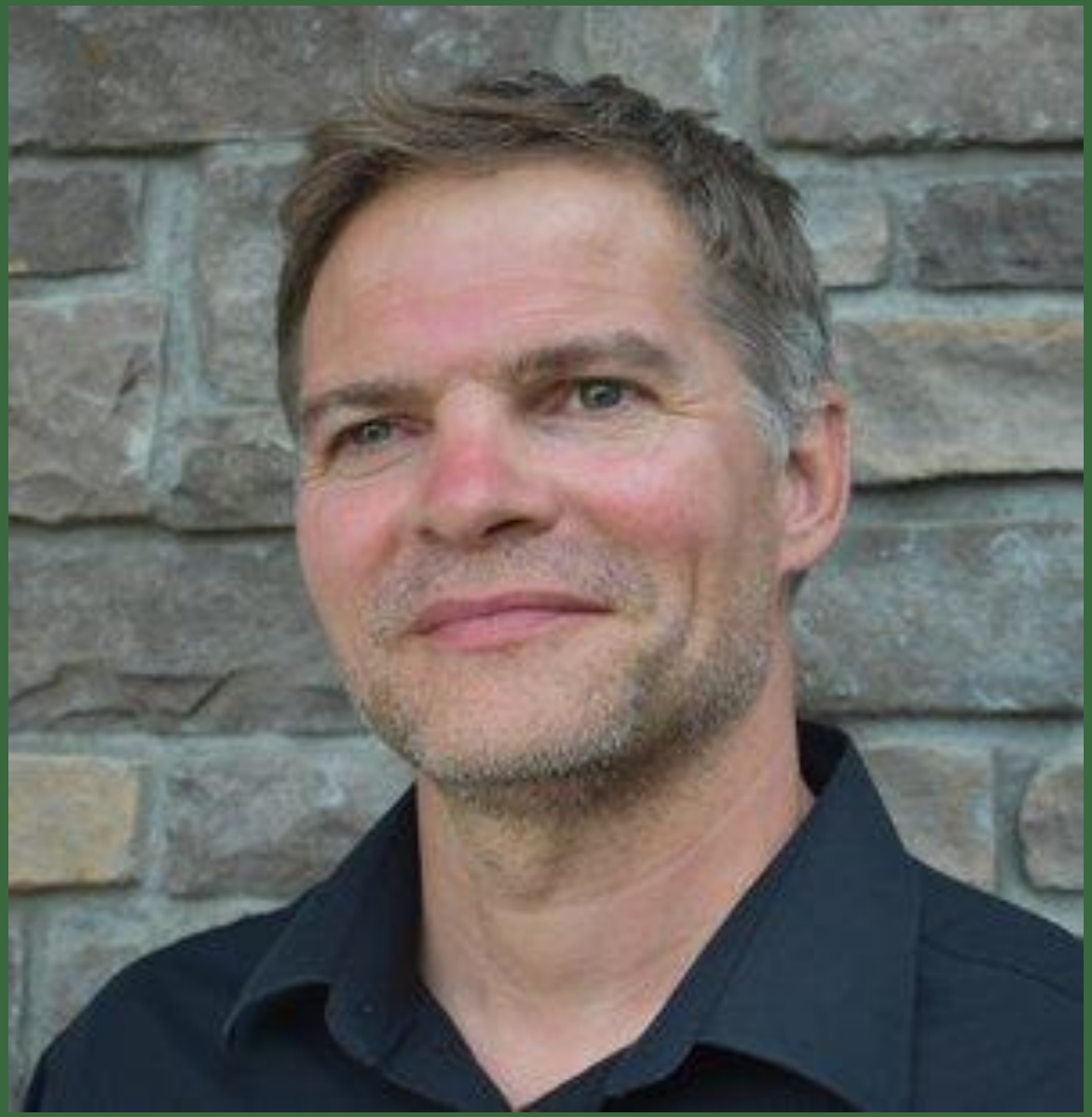

Disclosures
Colleen Tewksbury

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- University of Pennsylvania

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- Eli Lilly
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Honorarium

- Eli Lilly
- CDR Certificate of Training in Adult and Pediatric Obesity Interventions

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Learning Objectives

At the end of the presentation, attendees will be able to:

- Identify evidence-based methods for measuring body composition in research and clinical settings.
- Summarize existing research on changes in body composition associated with weight loss, especially with use of today's obesity medications.
- Detail existing literature and recommendations for adequate physical activity and nutrition during weight loss and maintenance phases to optimize body composition and promote long-term health.
- Understand the RDN's role in providing physical activity recommendations within their scope of practice.

Body Composition Considerations with Calorie Deficit and Weight Loss

John M. Jakicic, PhD, FACSM, FTOS, FAHA, ACSM-CEP, ACSM-ETT

University of Kansas Medical Center

Department of Internal Medicine

Division of Physical Activity and Weight Management

Kansas City, KS

Outline

- Techniques and considerations of body composition assessment.
- Changes in body composition with weight loss.
- Implications on muscle.
- Opportunities and future directions.

Body Measurement Considerations within the Context of Obesity and Weight Loss

What measurement techniques are available?

Weight

Measured using a scale

Provides a measurement of body mass

Measurement Considerations

- Calibration
- Scale needs to be calibrated regularly.
- Standardization
- Time of day
- Clothing

Limitations

- Does not measure distribution of body weight.
- Does not measure the composition of body weight .

Image by Joachim Schnürle from Pixabay

Body Mass Index

Computed from measures of body weight and height

Provides an index that may be associated with excess adiposity and related health risk.

Measurement Considerations

- Calibration
  - Scale needs to be calibrated regularly.
  - Stadiometer (height board) needs to be calibrated regularly.
- Standardization
  - Time of day
  - Clothing

Limitations

- Does not measure distribution of body weight
- Does not measure the composition of body weight
  - It may miss classify some individuals
- BMI cut-points associated with health risk may vary by individual characteristics

Circumference Measures

Provides a measure of body weight distribution

Waist circumference is commonly recommended

- Other body areas can also be measured (e.g., hip).

Measurement Considerations

- Training of technician.
  - Intra- and inter-technician variability
- Standardization
  - Clothing
  - Anatomical areas to be measured.
  - Spring loaded Gulick measurement tape is recommended.
  - Allows for standardization of tension on the tape measure.

Limitations

- Can be used to “estimate” percent body fat.
- Does not differentiate between the types of body tissues that are being measured.

Body Composition

Components of Body Composition

- Adipose tissue

- Fat-Free Mass
  - Lean tissue
    - Muscle
    - Connective Tissue
    - Organ Tissue
  - Bone

- Water

Body Composition

Measurement Techniques

- Anthropometry (e.g., skinfolds, circumferences)
- Bioelectrical Impedance Analysis (BIA)
- Hydrostatic Weighing (underwater weighing)
  - Adipose tissue (less) will weigh less in water than lean tissue (more dense).
- Air Displacement Plethysmography (ADP)
  - Uses air displacement per body volume to estimate body composition.
- Dual-Energy X-Ray Absorptiometry (DXA)
- Other imaging techniques
  - Magnetic Resonance Imaging (MRI)
  - Computerized Tomography Scan (CT Scan)

Body Composition Measurement Considerations within the Context of Obesity Treatment

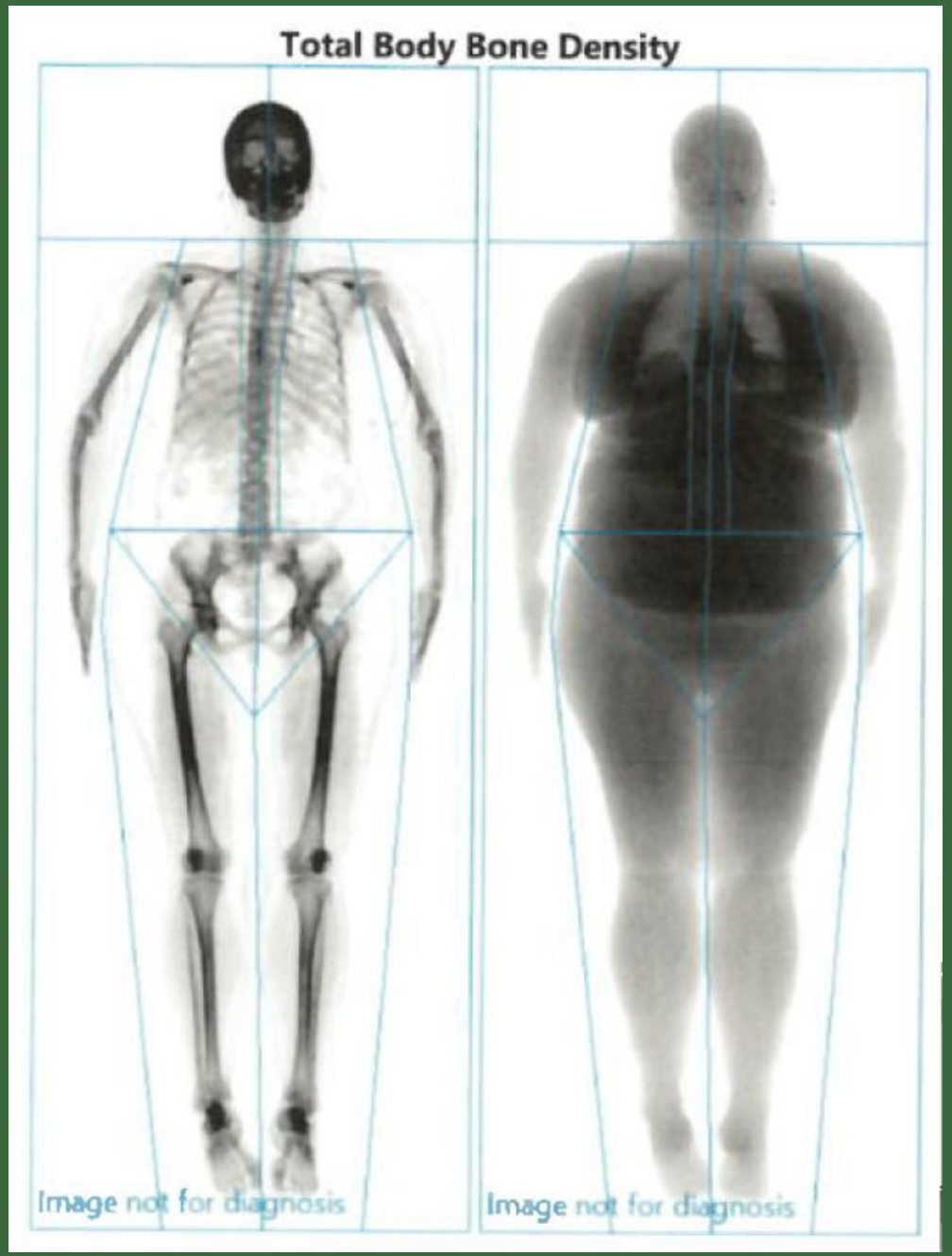


Image from de-identified scan from Dr. Jakicic's research laboratory

	Adipose Mass	Fat-Free Mass	Lean Body Mass	Muscle Mass	Connective Tissue	Organ Tissue	Bone	Water	Distribution of Weight
Weight									
BMI or BMI Prime									
Circumference Measurements	☑	☑							☑
Skinfold Measurements	☑	☑							
Bioelectrical Impedance Analysis (BIA)	☑	☑		?				☑	
Hydrostatic Weighing	☑	☑							
Air Displacement Plethysmography	☑	☑							
DXA	☑	☑	☑	?			☑		☑
MRI	☑	☑	☑	☑	☑	☑	☑		☑
CT Scan	☑	☑	☑	☑	☑	☑	☑		☑

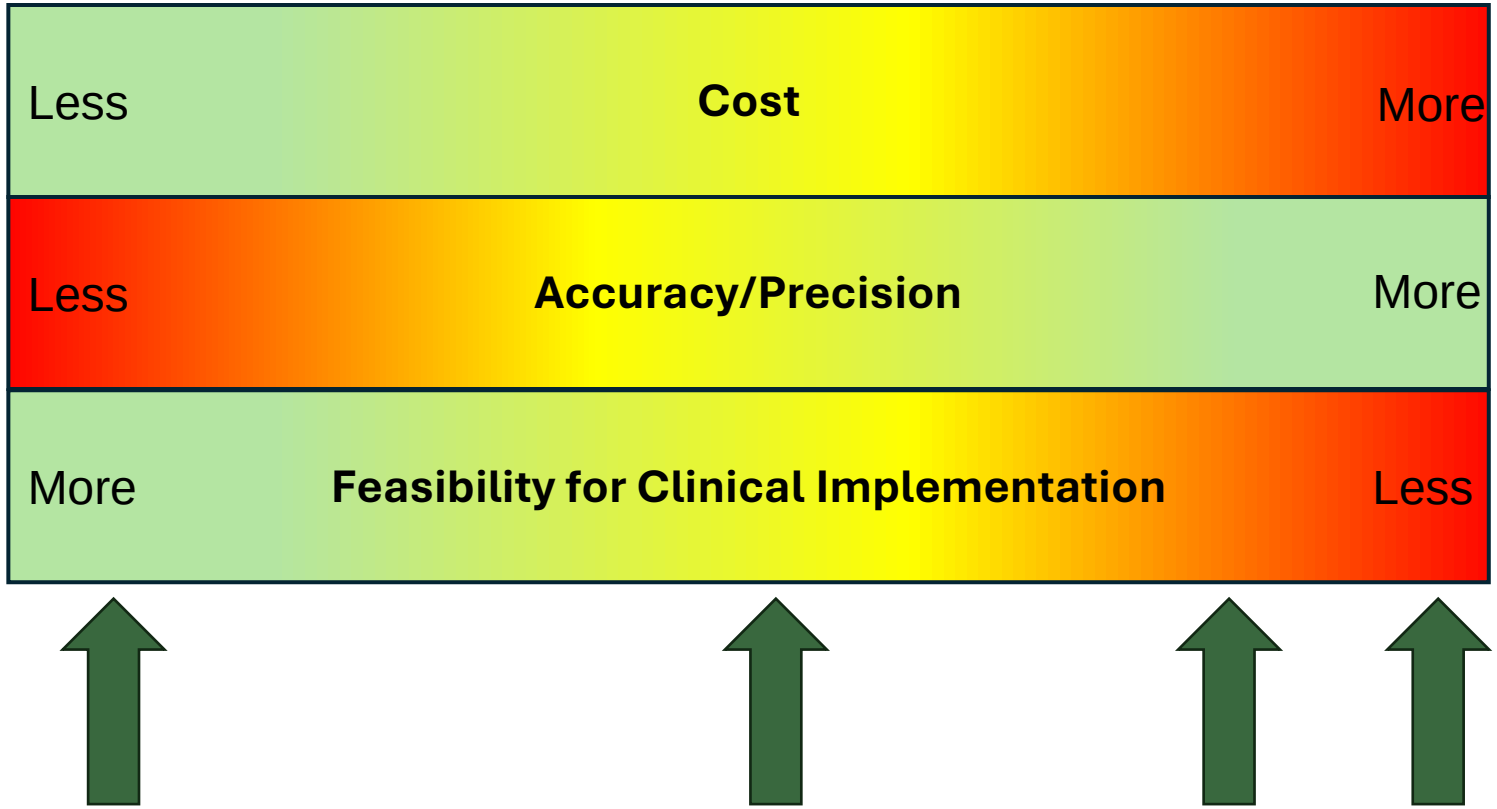
Deciding on an Appropriate Measurement of Body Composition

Cost

Accuracy/Precision

Feasibility for Clinical Implementation

Deciding on an Appropriate Measurement of Body Composition



Anthropometry (Skinfolds, Circumferences)

Bioelectrical Impedance Analysis (BIA)

**BIA is very feasible for clinical implementation*

DXA

MRI / CT

Meaningful Detectable Change in Body Composition

The magnitude of change that exceeds the potential error in the measurement.

How much change in body composition is needed to exceed the potential error in the measurement?

4%

Changes in Body Composition with Weight Loss

	Modest Reduction in Energy Intake[1]	Very Low Energy Diet (VLED)[2]	GLP-1RA's[3]
Change in Body Weight	-9.3%	-19.8%	~15% to 20%
Percent of Weight Loss from the Reduction in Adipose Tissue	82.5%	77.4%	~60% to 75%
Percent of Weight Loss from the Reduction in Lean Body Mass	16.5%	22.6%	~25% to 40%

[1]Jakicic JM, Rogers RJ, Lang W, Gibbs BB, Yuan N, Fridman Y, Schelbert EB. Impact of weight loss with diet or diet plus physical activity on cardiac magnetic resonance imaging and cardiovascular disease risk factors: Heart Health Study randomized trial. Obesity (Silver Spring). 2022 May;30(5):1039-1056. PMID: 35470972; PMCID: PMC9813917.
[2]Donnelly JE, Pronk NP, Jacobsen DJ, Pronk SJ, Jakicic JM. Effects of a very-low-calorie diet and physical-training regimens on body composition and resting metabolic rate in obese females. Am J Clin Nutr. 1991 Jul;54(1):56-61. PMID: 2058588.
[3]Wadden TA, Chao AM, Moore M, Tronieri JS, Gilden A, Amaro A, Leonard S, Jakicic JM. The Role of Lifestyle Modification with Second-Generation Anti-obesity Medications: Comparisons, Questions, and Clinical Opportunities. Curr Obes Rep. 2023 Dec;12(4):453-473. PMID: 38041774; PMCID: PMC10748770.

Additional Implications for Obesity and Weight Loss

- Lean body mass ≠ Muscle Mass
- Volume vs. Quality of Tissue

Jakicic JM, Rogers RJ, Church TS. Physical activity in the new era of antiobesity medications. Obesity (Silver Spring). 2024 Feb;32(2):234-236. doi: 10.1002/oby.23930. Epub 2023 Oct 17. PMID: 37849057.

Muscle Quality

“Poor muscle quality (MQ) is a hidden health condition in obesity, commonly disregarded and underdiagnosed, associated with poor health-related outcomes.”

MQ is a broad term that can include imaging, histological, functional, or metabolic assessments, evaluating beyond muscle quantity.

MQ assessment is highly heterogeneous and requires further standardization. Common definitions of MQ include:

- Muscle-specific strength (or functional MQ), the ratio between muscle strength and muscle quantity
- Muscle composition (or morphological MQ), mainly evaluating muscle fat infiltration.

An individual with obesity might still have normal or higher muscle quantity despite having poor MQ

- Techniques for direct measurements are needed.

Vieira FT, Cai Y, Gonzalez MC, Goodpaster BH, Prado CM, Haqq AM. Poor muscle quality: A hidden and detrimental health condition in obesity. Rev Endocr Metab Disord. 2025 Jan 21. doi: 10.1007/s11154-025-09941-0. Epub ahead of print. PMID: 39833502.

What is the Intent for Measuring Body Composition?

- To simply quantify the change in body composition beyond what is observed with just the change in weight?
  - Is there a clinical reason to know this information?
- Concerns over “muscle loss” with weight loss?
  - Does your measurement of body composition provide an accurate measure of muscle and the change in muscle?
  - Is the muscle loss associated with the loss of muscle strength, muscle function, or other negative health outcomes?
- Concerns over bone loss with changes in nutrition and weight loss?
  - Does your measurement of body composition provide a measure of change in bone?
- Other reasons?

What would you do differently for the patient if you have this information?

Opportunities and Future Directions

Measurement of body composition across methods of weight loss.

- Comparison of different techniques to measure body composition.
- Clinical measures vs. Research measures

Direct measures of muscle volume and muscle quality

Implications of change in body composition with weight loss therapies on other clinically relevant health outcomes.

Implications of lifestyle factors on body composition with weight loss

- Nutritional considerations (e.g., protein intake, magnitude of energy restriction, etc.)
- Physical activity / Exercise (e.g., exercise dose, exercise types, etc.)

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Questions?

Obesity Medications and the RDN

Physical Activity Guidance for People with Excess Weight

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Department of Endocrinology
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Outline

- Exercise “prescription” and stages of weight management
- Physical activity and body composition, health, and function
- Scope of practice
- Research questions

General Recommendations for Physical Activity

- Adults should do at least 150-300 minutes a week of moderate-intensity or 75-150 minutes of vigorous-intensity aerobic activity
- Muscle strengthening on 2 days or more per week
- In addition, older adults should do multicomponent physical activity that includes balance training
- Moving more and sitting less will benefit nearly everyone
- Individuals performing the least physical activity will benefit most by even modest increases in moderate to vigorous physical activity

2018 Physical Activity Guidelines Advisory Committee. 2018 Physical Activity Guidelines Advisory Committee Scientific Report. Washington, DC: U.S. Department of Health and Human Services, 2018.; Piercy et al., *JAMA* 2018

Powerpoint stock photo

Let’s imagine a person asks, “How many grams of carbohydrate should I eat in a day?”

Well, it depends

Types of foods

Disease state

Calorie needs

Are you an athlete?

What are you doing now?

What foods do you like?

Must Reads!

SPECIAL COMMUNICATIONS

Physical Activity and Excess Body Weight and Adiposity for Adults. American College of Sports Medicine Consensus Statement

JAKICIC, JOHN M.[1]; APOVIAN, CAROLINE M.[2]; BARR-ANDERSON, DAHEIA J.[3]; COURCOULAS, ANITA P.[4]; DONNELLY, JOSEPH E.[1]; EKKEKAKIS, PANTELEIMON[5]; HOPKINS, MARK[6]; LAMBERT, ESTELLE VICTORIA[7,8]; NAPOLITANO, MELISSA A.[9]; VOLPE, STELLA L.[10]

Author Information

Medicine & Science in Sports & Exercise 56(10):p 2076-2091, October 2024. | **DOI:** 10.1249/MSS.0000000000003520

ESC European Society of Cardiology

European Journal of Preventive Cardiology (2023) **30**, 1975–1985
https://doi.org/10.1093/eurjpc/zwad229

FULL RESEARCH PAPER
Prevention in practice

The association between daily step count and all-cause and cardiovascular mortality: a meta-analysis

Maciej Banach[1,2,3,4]*, Joanna Lewek[1,2], Stanisław Surma[5], Peter E. Penson[6,7,8], Amirhossein Sahebkar[9,10,11], Seth S. Martin[4], Gani Bajraktari[12,13], Michael Y. Henein[13], Željko Reiner[14], Agata Bielecka-Dąbrowa[1,2], and Ibadete Bytyçi[12,13]; on behalf of the Lipid and Blood Pressure Meta-analysis Collaboration (LBPMC) Group and the International Lipid Expert Panel (ILEP)

ESC European Society of Cardiology

European Journal of Preventive Cardiology (2025) **32**, 184–220
https://doi.org/10.1093/eurjpc/zwae279

CONSENSUS DOCUMENT
Diabetes and metabolic disorders

Obesity and cardiovascular disease: an ESC clinical consensus statement

Konstantinos C. Koskinas[1]*†, Emeline M. Van Craenenbroeck[2,3]*†, Charalambos Antoniades[4], Matthias Blüher[5], Thomas M. Gorter[6], Henner Hanssen[7], Nikolaus Marx[8], Theresa A. McDonagh[9,10], Geltrude Mingrone[11,12], Annika Rosengren[13,14], and Eva B. Prescott[15]*‡; the ESC Scientific Document Group

Limited Research

- Newer medications- we still don’t know that much
- Rely on lifestyle intervention studies and metabolic and bariatric surgery studies
- Impact of *prescribing* exercise vs. training studies (effectiveness vs efficacy)

Jobanputra, et al., *Obes Rev*, 2023

People Respond Differently to Physical Activity

- Small changes (2-3 kg on average) without diet – high variability
- Slightly more weight loss from aerobic vs. resistance training
- Energy expenditure may be relatively small
- Large effect of self-reported, non-randomized PA on weight recurrence
- Smaller effect on weight recurrence when randomly assigned to levels of PA

King et al., *Int J Obes*, 2008; Oppert et al., Rev Metab Dis, 2023

Prevention

Photo by LeeAnn Cline on Unsplash

The more physically active we are, the more tightly appetite is coupled with energy expenditure.

Being highly sedentary increases the chances of dysregulation of appetite.

Photo by Vestfoldmuseene on Unsplash

Powerpoint stock image

Blundell et al., *Obesity Reviews*, 2015

Physical Activity During Weight Loss: Just a Drop in the Bucket?

Impact of physical activity during (rapid) weight loss

- Depends on the intervention mode, intensity, stage of weight loss
- Individual variability
- Resistance training leads to improvements in strength compared to weight loss alone
  - LBM still generally decreases
  - Relative strength increases
  - Absolute strength is maintained or slightly decreases
- Improvements in cardiorespiratory fitness can be masked by weight loss
- Cardiorespiratory improvements are more evident once weight loss slows
- Protein supplementation alone will have minimal effect on strength

Gil et al., J Cachexia Sarcopenia Muscle, 2021; Oppert et al. *Obesity*, 2018; Lundgren et al., *NEJM,* 2021

Other Health Benefits of Physical Activity

2018 Physical Activity Guidelines Advisory Committee Scientific Report

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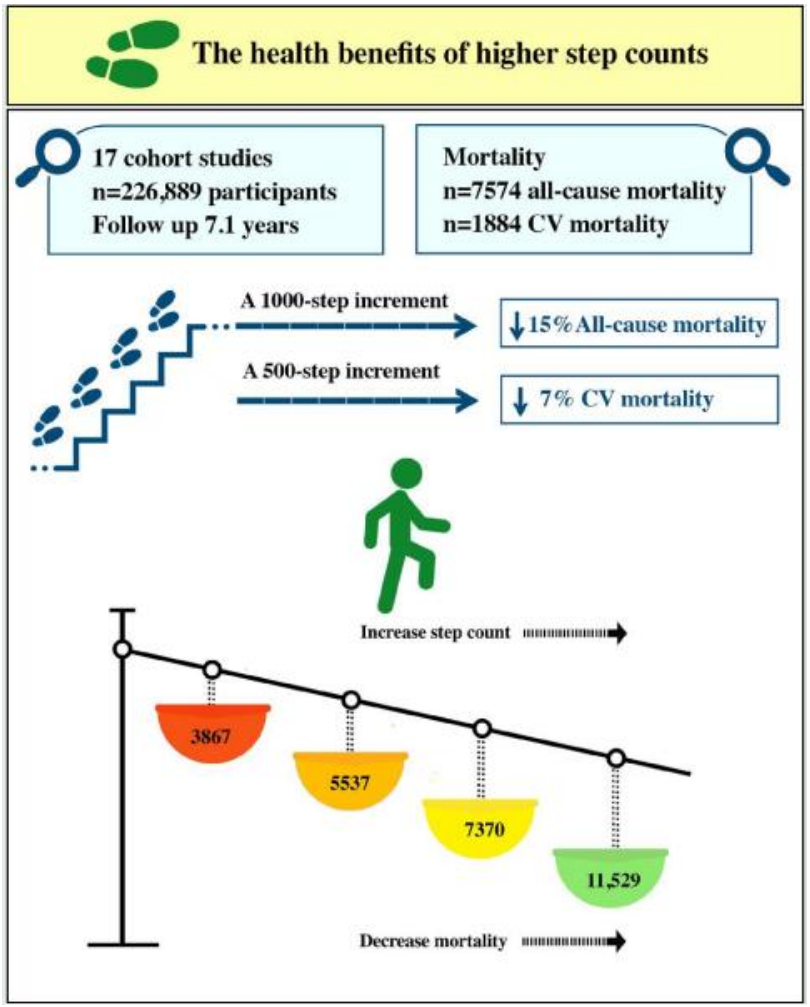
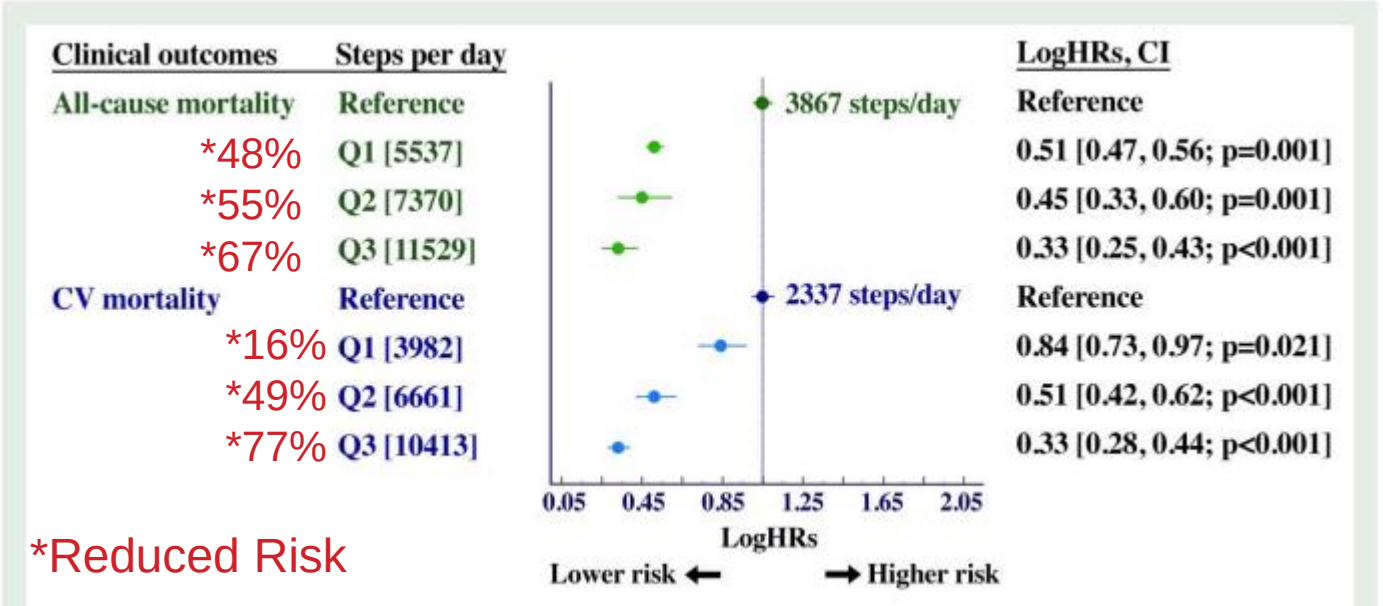
Diabetes
Heart Disease
Hypertension
Stroke
Dementia
Pain/Function of Arthritis
Osteoporosis
Sleep
Depression/Anxiety
Concentration

Breast Cancer
Colon Cancer
Bladder Cancer
Esophageal Cancer
Kidney Cancer
Endometrial Cancer
Stomach Cancer
Energy
Quality of Life

Messaging: Small Changes Make a Difference



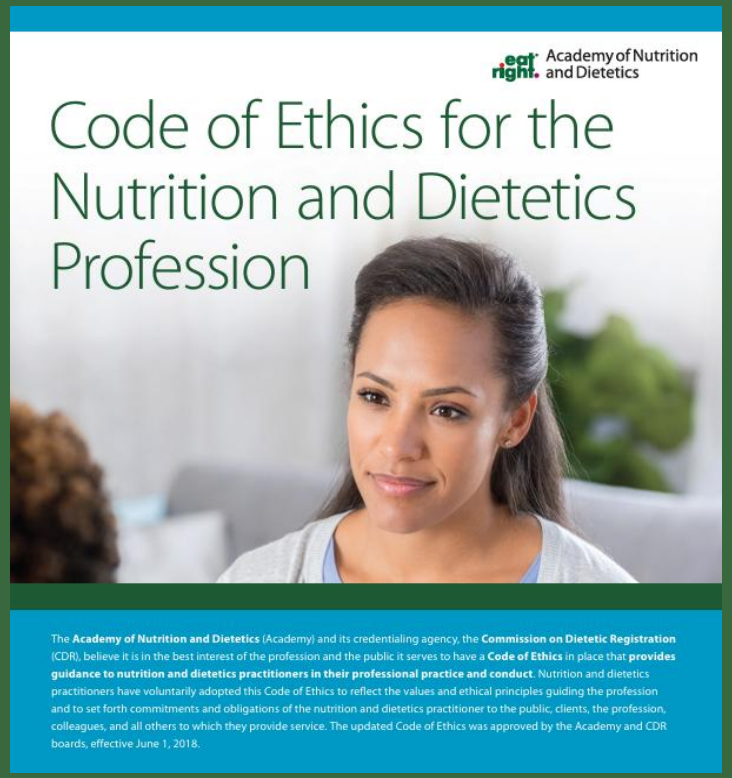


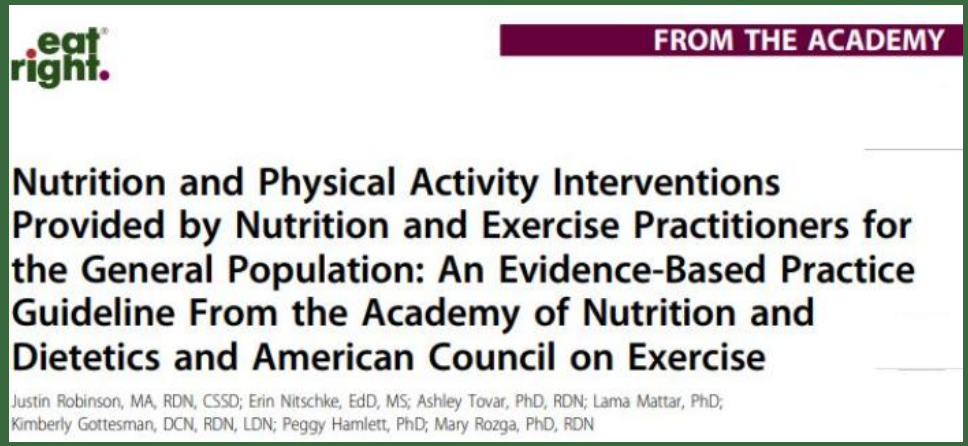
*Reduced Risk

Banach et al., European Journal of Preventive Cardiology, 2023

Principle 1: Competence

- Use evidence-based approaches within competence
- Continuously develop and enhance expertise
- Recognize limitations
- Balance values of clients with your expertise/judgement
- Collaborate with others and seek counsel
- Refer to exercise professional if:
- Pain/injuries
- Sedentary
- Struggle with achieving fitness goals
- Disease or illness
- Doctor-ordered limitations





Does your client need medical clearance?

- **Relative** risks of cardiac events are higher during vigorous physical exertion, but **absolute** risk is very low.
- Sudden cardiac death occurs every 1.5 million **episodes** of vigorous physical exertion in men
- Sudden cardiac death occurs once in every 26.5 million **hours** of moderate to vigorous exertion in women.
- There are substantial risks associated with physical inactivity

Riebe, et al., *Med Sci Sports Exerc*, 2015; Albert et al., *N Engl J Med*. 2000; Whang et al., *JAMA*, 2006;

ACSM Preparticipation Guidelines: Symptoms, Current Exercise, Disease (CV, DM, Renal)

- If Currently exercising:
  - No metabolic disease or symptoms – **No medical clearance necessary**
  - Known metabolic disease but no symptoms - **No medical clearance for moderate exercise**

- If Not currently exercising
  - No disease, no symptoms – **No medical clearance for moderate exercise**
  - Known disease and asymptomatic – **Medical clearance recommended**

- Symptoms (chest pain, SOB, dizziness, etc.) – **Medical Clearance needed (regardless of disease state)**

Riebe, et al., *Med Sci Sports Exerc*, 2015

Without a degree or certification what can I do?

- Ask questions…How is PA related to values and reasons for weight loss?
- Establish patterns
- Enjoyment
- Explore strengths and challenges
- Quality of life (energy, sleep, sense of mastery, life purpose)
- Accountability/Feedback with self-monitoring
- Resources and Referrals

Research Questions

- See ACSM Consensus Statement (Physical Activity and Excess Body Weight and Adiposity for Adults).
- My opinion
  - Long-term studies examining how different levels/intensities/types of physical activity impact health and quality of life among people taking obesity medications
  - Assessment and interventions that tailor treatment to promote long-term physical activity/reduce sedentary time
  - Technological and environmental approaches that increase physical activity throughout the lifespan

Summary

Patients are not information receptacles

150 min + 2 days but...all movement counts and has benefit

Response to physical activity is variable

Increased physical activity can complement nutrition interventions

Function over body composition

RDs have an important role

More research is needed

"BECAUSE, ON AVERAGE, THESE MEDICATIONS ARE HIGHLY EFFECTIVE FOR WEIGHT LOSS, THE FOCUS OF PHYSICAL ACTIVITY SHOULD NOT BE ADDITIONAL WEIGHT LOSS. RATHER, WE POSIT THAT PHYSICAL ACTIVITY IS IMPORTANT FOR …BODY COMPOSITION, CARDIORESPIRATORY FITNESS, MUSCULAR STRENGTH AND ENDURANCE, PHYSICAL FUNCTION, AND QUALITY OF LIFE." *JAKICIC, ET AL., 2024*

Physical activity is not an antidote nor a punishment for an imperfect diet. It need not be like bad tasting medicine we take with a sour look on our face. Instead, our ability to move our bodies is a gift, one that can become even more meaningful with weight loss or improved fitness. We can celebrate our capabilities by connecting our fitness to the most important things in life, experiencing them with greater energy and joy.

We can move in ways that connect ourselves with others and nature, noticing the improvement in our perspective as our body warms and then cools. We can demonstrate self-care as we establish a regular pattern of movement, perhaps escaping in our favorite music, or breathing rhythmically as we stay connected to the changing sensations that accompany movement. It need not hurt to help, and pain can be a gentle reminder to try something different. If we choose to test our physical limits we can smile with confidence, letting go of self-doubt, knowing we can accomplish challenging things.

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Questions?

Pharma and Forks:

Navigating Nutrition in Obesity Medication Treatment

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Historical Focus of Nutrition in Behavioral Weight Loss

- Increase in appetite of 100kcal/day from baseline for every 1kg body weight loss
- Many focus on maintaining the calorie deficit (Energy Intake – Energy Expenditure)
- Nutrition and behavioral strategies focus on the difference between Energy Intake and Appetite
  - While maintaining nutrition status and preventing malnutrition

Hall, K. D., Sacks, G., Chandramohan, D., Chow, C. C., Wang, Y. C., Gortmaker, S. L., & Swinburn, B. A. (2011). Quantification of the effect of energy imbalance on bodyweight. *The Lancet*, *378*(9793), 826-837.
Jensen MD, et al. *Circulation*. 2014;129(25 Suppl 2):S102-38.

Intensive Behavior Therapy vs. Pharmacotherapy Roles

Obesity medications are indicated “as an adjunct to a reduced calorie diet and increased physical activity”

“The rationale for use of medications is to help patients adhere to a lower calorie diet more consistently in order to achieve more sufficient weight loss and health improvements when combined with increased physical activity.”

Jensen MD, et al. *Circulation*. 2014;129(25 suppl 2):S102-38.

Intensive Behavior Therapy vs. Pharmacotherapy Roles

Behavior therapy modifies external environment

- Decreased exposure to food
- Decreased eating cues
- Increased awareness of intake
- Increased dietary restraint
- Selective food choice

Pharmacotherapy modifies internal environment

- Decreased hunger
- Decreased food preoccupation
- Decreased cravings
- Decreased reinforcing value of food
- Increased satiation

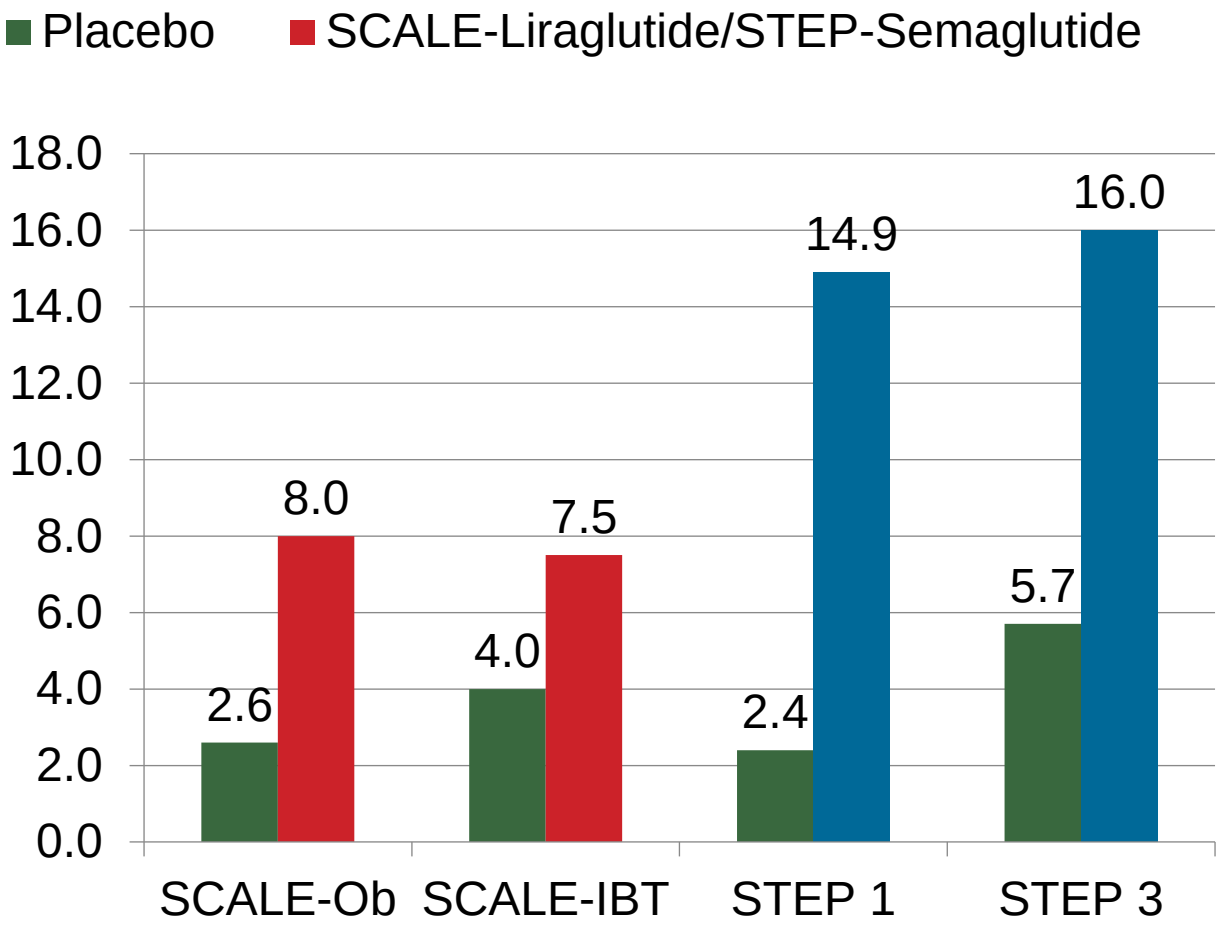
Wadden TA et al. *Arch Intern Med.* 2001;161:218-227.

Intensive Behavior Modification and Obesity Medications

- Wadden et al. initially demonstrated with sibutramine (now off-market)
- Additive effect of combining intensive behavior modification (often with a dietitian) with medications due to intervening on both internal and external environments
  - 5.6 ± 5.0 kg Drug Alone
  - 11.4 ± 7.1 kg Lifestyle Group
  - 17.9 ± 5.8 kg Combined Group
- Larger weight losses demonstrated with other obesity medications when combined with intensive lifestyle intervention

Wadden TA, Berkowitz RI, Sarwer DB, Prus-Wisniewski R, Steinberg C. Benefits of lifestyle modification in the pharmacologic treatment of obesity: a randomized trial. Archives of internal medicine. 2001 Jan 22;161(2):218-27.

Intensive Behavioral Intervention with Incretin-Based Therapy



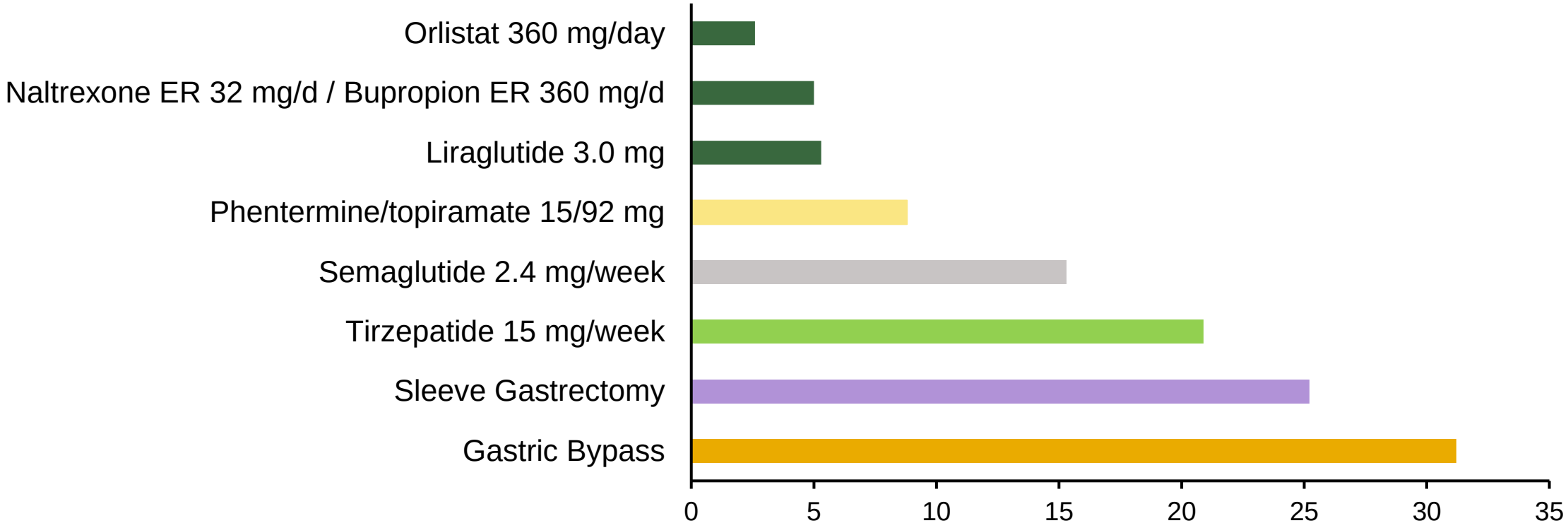
- Not head-to-head trials but important to note
- SCALE-Ob and STEP 1: lower intensity nutrition counseling and monitoring
- SCALE-IBT and STEP 3: Intensive Behavioral Therapy provided with medication
- Similar weight losses raises the question of whether current gold-standard behavioral/nutrition interventions will have an additive effect

Wadden TA, Tronieri JS, Sugimoto D, Lund MT, Auerbach P, Jensen C, Rubino D. Liraglutide 3.0 mg and Intensive Behavioral Therapy (IBT) for Obesity in Primary Care: The SCALE IBT Randomized Controlled Trial. Obesity (Silver Spring). 2020 Mar;28(3):529-536.

Pi-Sunyer, Xavier, et al. "A randomized, controlled trial of 3.0 mg of liraglutide in weight management." *New England Journal of Medicine* 373.1 (2015): 11-22.

Wilding et al. *N Engl J Med.* 2021;384:989-1002. Wadden et al. *JAMA.* 2021;325(14):1403-13.

Reminder of Average Weight Loss with Obesity Medication Treatment



BUT AS DR. ALMANDOZ SAID IN LAST WEBINAR-- PEOPLE AREN'T AVERAGE!

Yanovski, et al. *JAMA.* 2014; 311(1). ; Alamuddin,et al. *J Clin Oncol.* 2016; 34(35). Wilding et al. *N Engl J Med.* 2021; 384:989-1002. Jastreboff A, et al. et al. NEJM 387.3 (2022): 205-216.

Modeled Calorie Reduction IBT vs. Pharm vs. Surgery

Intensive Behavioral Therapy

- Both IBT studies in order to achieve average weight loss included steep decline in caloric intake and gradual increase over time
    - Comprehensive Assessment of Long Term Effects of Reducing Intake of Energy (CALERIE) phase 2 study 820 kcal/day reduction
    - DIETFITS 1200 kcal/day reduction

Incretin-Based Therapy

- Semaglutide and Tirzepatide modeled experience sustained large calorie reductions over longer periods of time in order to achieve reported weight losses
    - Tirzepatide 830 kcal/day reduction and 1560 kcal/day reduction at greatest dose
    - Semaglutide 610 kcal/day reduction and 1300 kcal/day reduction at greatest dose

Hall KD et al. *Obesity* 32.6 (2024): 1163-1168.

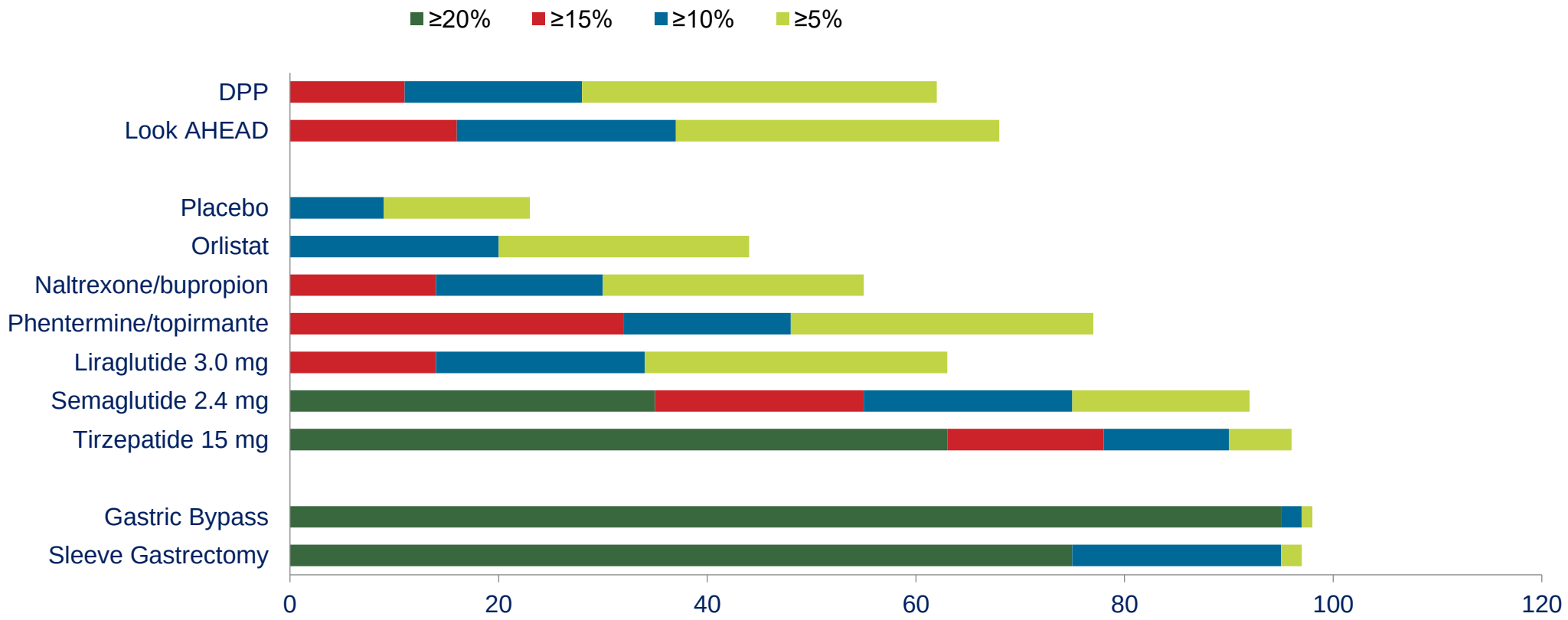
Modeled Calorie Reduction IBT vs. Pharm vs. Surgery

Bariatric Surgery

- Similar to IBT, large decrease in calorie intake followed by gradual increase
- Initial decrease of 3600 kcal/day in Roux-en-Y gastric bypass
- Produces the largest weight losses

Hall KD et al. *Obesity* 32.6 (2024): 1163-1168.

A Closer Look at Variation in Response

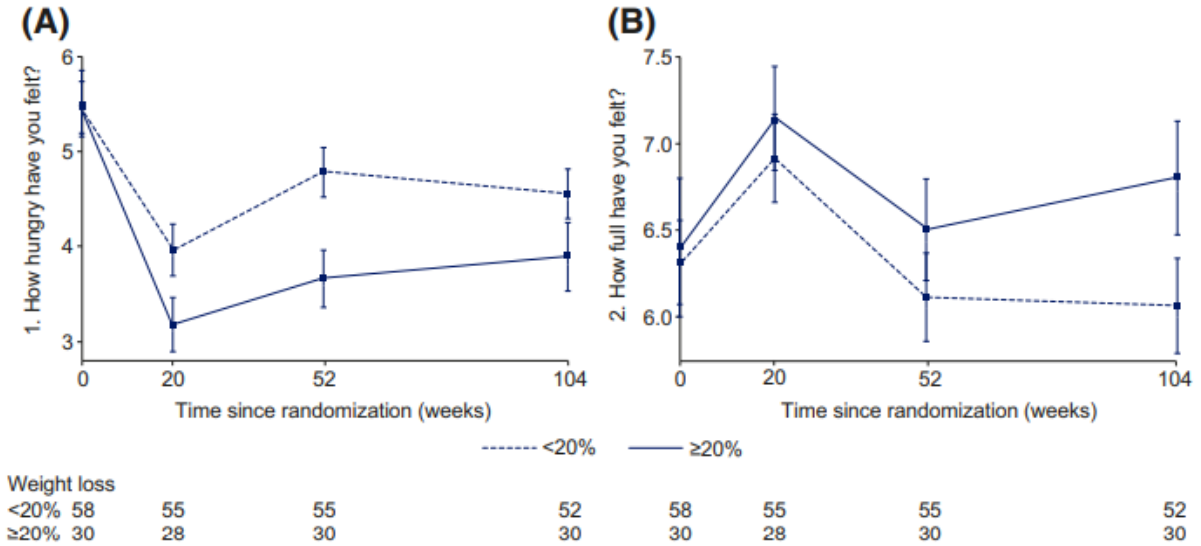


A significant proportion of patients are experiencing weight losses similar to bariatric surgery with incretin-based therapies

Heymsfield, Wadden. *N Engl J Med* 2017;376:254–66. ; Jastreboff A, et al. et al. NEJM 387.3 (2022): 205-216. Arterburn D, et al. *Ann Intern Med*, *169*(11), pp.741-750.

Reported Hunger/Fullness Associated with Weight Loss in Semaglutide

- Internal cues are driving decreases in caloric intake and weight loss
- If internal environment is so drastically changed, what is the role of IBT in external environment?
  - Does the focus shift?
- Those with lesser response to medication may benefit more than others?



Wharton S., Et al, o*besity*, 2023 *31*(3), pp.703-715.

The Degree of Weight Loss Matters in Health and Nutrition

- Increased likelihood of improvement and resolution of weight-related conditions
- Increased risk for malnutrition?
  - Greater incidence of nutrition-related complications in large, rapid weight losses
  - Average weight change is smaller than seen in bariatric surgery, but some are losing similar or greater
  - Limited nutrition data collected in initial efficacy trials so much is unknown
- Focus may be shifting from quantity to quality

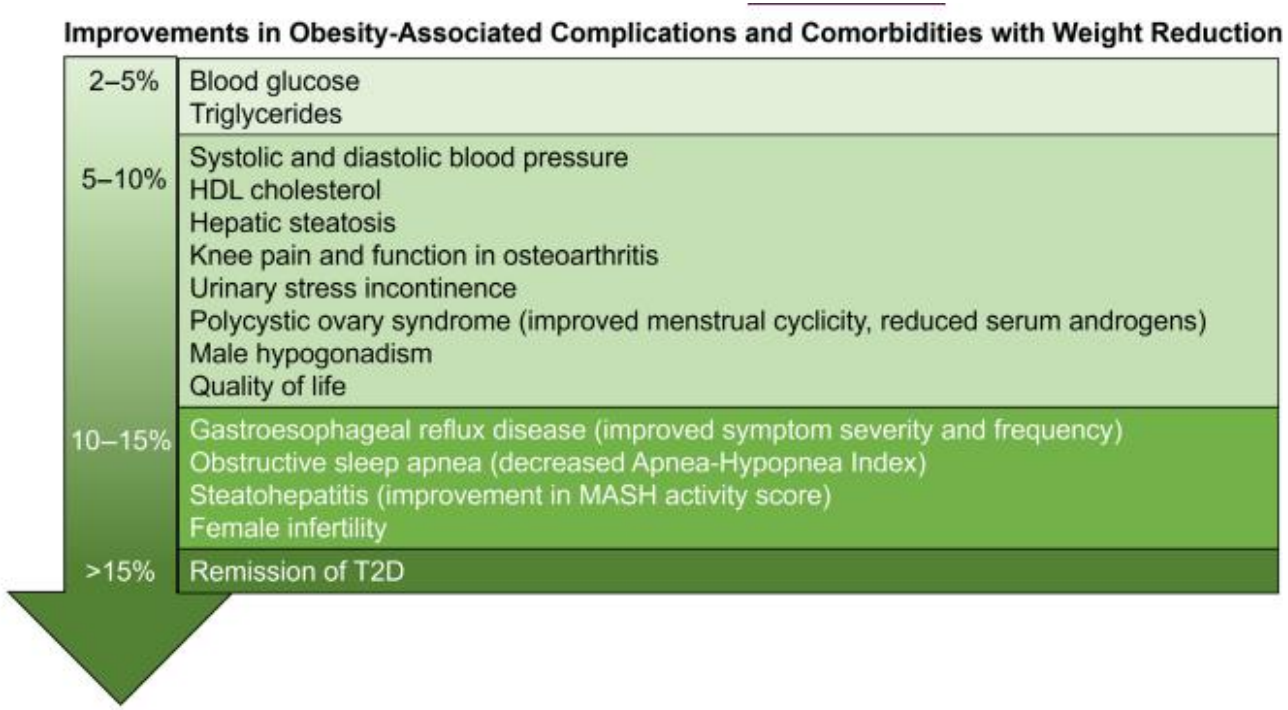


FIGURE 1 Potential benefits of weight reduction in obesity. Garvey et al. [5], Lingvay et al. [6], Ryan and Yockey [7], and Wing et al. [8]. MASH, metabolic dysfunction-associated steatohepatitis (formerly nonalcoholic steatohepatitis [NASH]); T2D, type 2 diabetes.

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):

Calories are the Driver

- Mifflin St. Jeor recommended for determining needs
- Likely calorie reduction of 16-39% from baseline
  - Modeled calorie reduction of 610 to 1560 kcal/day reduction from baseline
- IBT recommendation of 1200–1500 calories/day for women and 1500–1800 for men general best practice
  - Self monitoring recommended
  - Specific goals and focus of self-monitoring tailored to the needs of the patient

- Counseling similar to bariatric surgery of meeting needs and monitoring changes in cues while building foundation for long-term maintenance may be appropriate

Andromalos L, et al. *JAND.* 2019;119(4):678-686.
Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631.
Christensen, S, et al. *Obesity Pillars* (2024): 100121.

Prioritizing Protein

Recommended Dietary Allowance 0.8g/kg/day

- 46g/day women
- 56g/day men

10%–35% of energy intake from protein general recommendation

- Equates to 30-158g protein

>60–75 g/d in weight reduction programs

- Bariatric surgery minimum recommendation 60-80g/day

Prioritize protein in counseling

- Protein with each meal/snack
- Eat protein first at eating episodes

Limited evidence of specific recommendations based off fat-free mass

- Future goals may be to this in order to minimize loss

Consideration of protein supplementation on an individualized basis

- DGAs show most meet protein recommendations
- Some recommendations contradict each other

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631;
Image from Microsoft Stock Images

Carbohydrates

Recommended Dietary Allowance 130 g/d

- Some evidence in bariatric surgery lower levels can be safe

Acceptable Macronutrient Distribution Range 45%–65% of energy intake

- 135 to 245 g/day for a 1200- to 1500-kcal/day diet
- 170 to 290 g/day for a 1500- to 1800-kcal/day

Carbohydrate severe restriction not likely effective

- Nor necessary

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631

Image from Microsoft Stock Images

Fat

Acceptable Macronutrient Distribution Range of 20%–35% of energy intake from fats

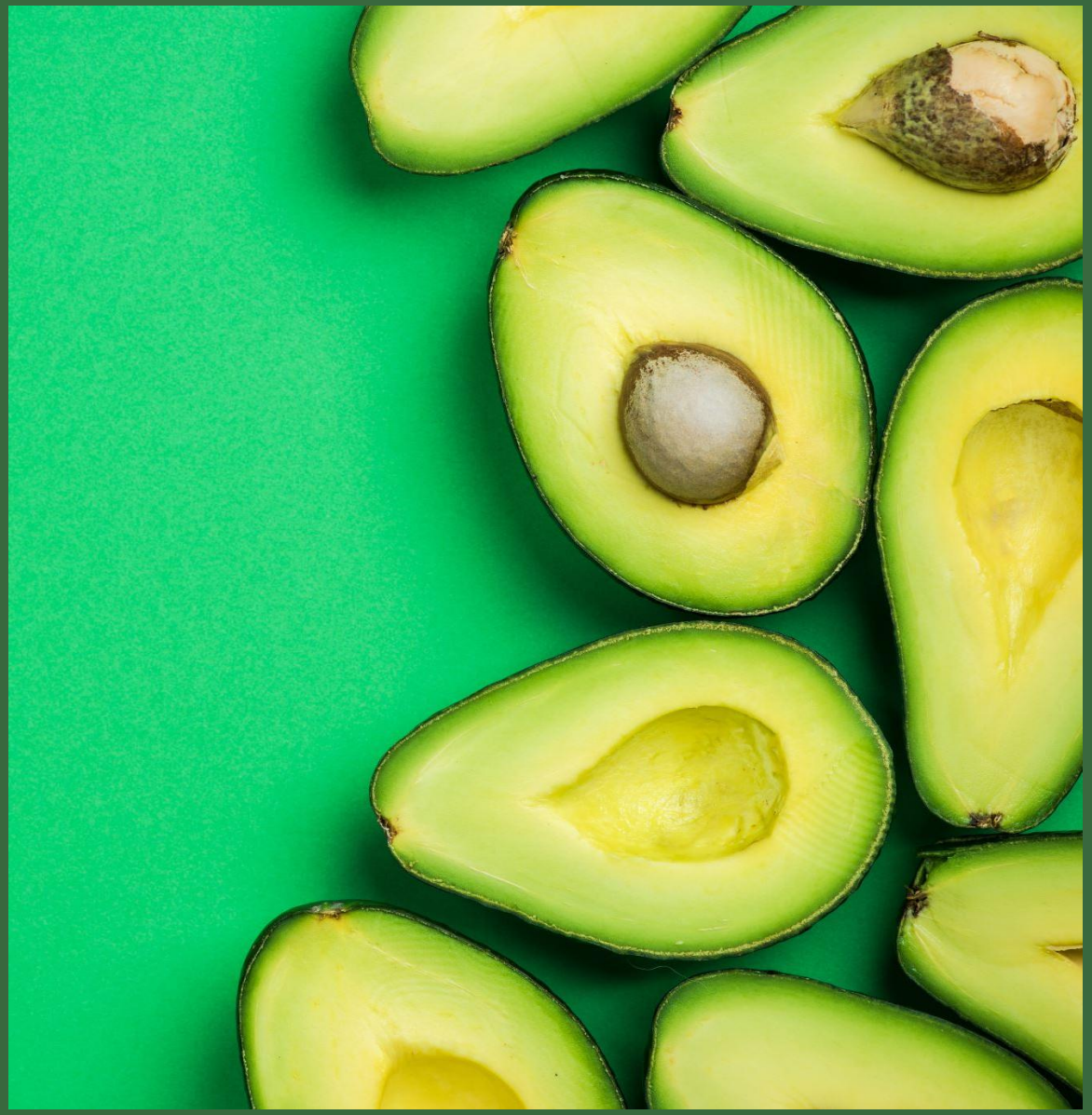
- 25 to 60 g/day for a 1200- to 1500-kcal/day diet
- 35 to 70 g/day for a 1500- to 1800-kcal/day diet

Avoid over restriction

- Increased risk of gallstone formation

Prioritize polyunsaturated fats

- Olive oil, canola oil, avocado, etc.



Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631; Image from Microsoft Stock Images

Fluid

General recommendation of at least 2-3 L fluid per day

If patient choses to severely restrict carbohydrates, focus on fluid for hydration

Limit sugar-sweetened beverages, caffeinated beverages, alcohol

Focus on water, low calorie beverages, and nutrient-dense beverages

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631

Fiber

Dietary Guidelines for Americans adequate intake

- Women 21-25 g/day
- Men 30-38g/day

Gradual increase in fiber if not meeting goals

Fiber supplement may be considered if unable to meet goals with food alone

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631

Image from Microsoft Stock Images

Prevalence of Specific Micronutrient Deficiencies in Obesity

Micronutrient	Prevalence of deficiency
Thiamine	15-29%
Folate	Up to 63%
Vitamin B12	2-18%
Vitamin A	6-14%
Vitamin D	Up to 97%
Vitamin E	2.2%
Vitamin K	30%
Iron	Up to 45%
Zinc	24-28%
Copper	Up to 70%
Magnesium	35%
Calcium	25-90%

Mohapatra S, Gangadharan K, Pitchumoni CS. Malnutrition in obesity before and after bariatric surgery. *Disease-a-month*. 2020;66(2):100866.
Krzizek E-C, Brix JM, Herz CT, et al. Prevalence of micronutrient deficiency in patients with morbid obesity before bariatric surgery. *Obesity surgery*. 2018;28:643-648.

Micronutrients

Little to no available data for micronutrient assessment, intervention, monitoring in incretin-based therapies

Consideration of supplementation, but not recommended

- Potentially multivitamin, calcium, vitamin D
- Potentially ongoing monitoring of micronutrient deficiencies

ALMANDOZ JP, ET AL. OBESITY. 2024 JUN 10.

Shifting Counseling Focus from Quantity to Quality

- Limited data on how diet quality changes with incretin-based therapy
- Populations eligible for medication treatment more likely to have moderately poor diet quality (Healthy Eating Index 2015)
  - Overweight: 53.2, Class 1 Obesity: 50.8, ≥Class 2 Obesity: 48.9
- >9 in 10 do not meet whole grain recommendations and exceed sodium recommendations
- 9 in 10 do not meet vegetable recommendations
- 4 in 5 do not meet fruit recommendations
- 3 in 4 of exceed saturated fat and refined grain recommendations
- 2 in 3 exceed added sugar recommendations
- Patients who undergo bariatric surgery see modest improvement in diet quality

Zhao, Yajie, and Tetsuya Araki. "Diet quality and its associated factors among adults with overweight and obesity: Findings from the 2015–2018 National Health and Nutrition Examination Survey." *British Journal of Nutrition* 131.1 (2024): 134-142.

Zarshenas, N., Tapsell, L.C., Neale, E.P., Batterham, M. & Talbot, M.L. The relationship between bariatric surgery and diet quality: a systematic review. *Obesity surgery* **30**, 1768-1792 (2020).

Phillips, Jennan A. "Dietary guidelines for Americans, 2020–2025." *Workplace health & safety* 69.8 (2021): 395-395.

Shifting of Craving

People on semaglutide report:

- Reduced hunger
- Decreased cravings
- Decreased difficulty in managing cravings
- Decreased difficulty in control of eating

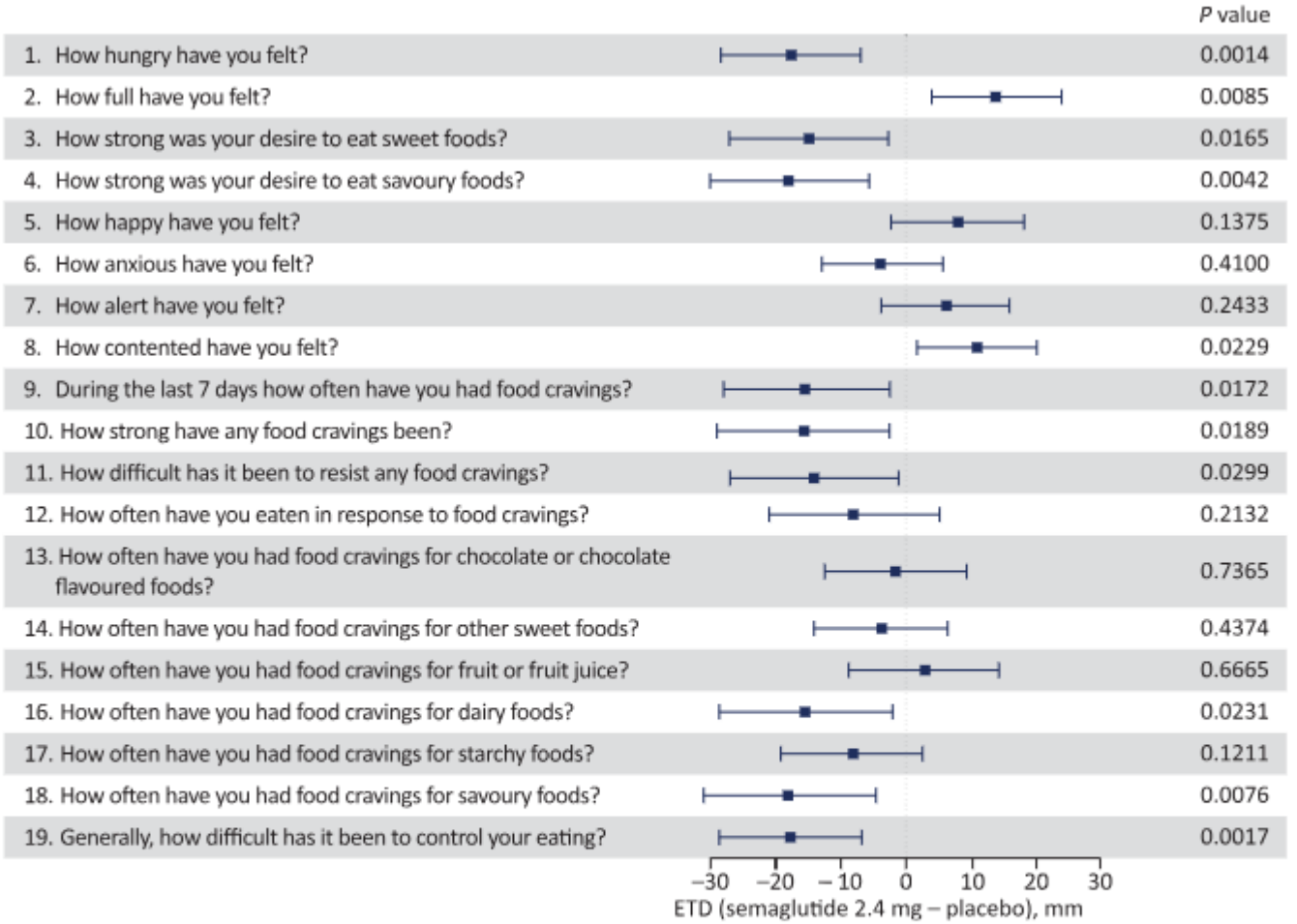


FIGURE 4 Control of eating and food cravings evaluated by the Control of Eating Questionnaire visual analogue scale at week 20. The Control of Eating Questionnaire was completed by participants at the end of the 20-week treatment period (day 141), based on their experience over the prior 7 days. Individual scores for each question were analysed using separate analysis of covariance models with change from baseline as response, baseline value of respective question as a covariate and treatment as factor (post hoc analysis methodology). The figure shows the estimated treatment difference (ETD) for semaglutide versus placebo (boxes) and 95% confidence interval (whiskers)

Friedrichsen M, Breitschaft A, Tadayon S, Wizert A, Skovgaard D. The effect of semaglutide 2.4 mg once weekly on energy intake, appetite, control of eating, and gastric emptying in adults with obesity. Diabetes Obes Metab. 2021 Mar;23(3):754-762. doi: 10.1111/dom.14280. Epub 2021 Jan 3. PMID: 33269530; PMCID: PMC7898914.

Focus Counseling to the Needs of the Patient

Likely including symptom management during graduated dosing	Dietary modifications may help limit these side effects

• Semaglutide Reported Side Effects
  • Nausea: 44%
  • Vomiting: 25%
  • Diarrhea: 32%
  • Constipation: 23%
• Tirzepatide Reported Side Effects
  • Nausea: 31%
  • Vomiting: 12%
  • Diarrhea: 23%
  • Constipation: 11%
	• Eat smaller, more frequent low-fat meals
	• Stop eating before feeling full
	• Avoid foods that may trigger or worsen symptoms
	• May need to reduce or modify fat source if experiencing gastrointestinal symptoms
	• Ensure adequate fluid intake
	• Incorporate dietary fiber

Wilding et al. *N Engl J Med.* 2021; 384:989-1002. ; Jastreboff A, et al. et al. NEJM 387.3 (2022): 205-216. Wharton S, et al. *Postgrad Med*. 2022;134(1):14-19.

Post-Weight Loss, Weight Maintenance

Longer-term studies of semaglutide and tirzepatide showing durable weight losses	• Counseling remains the same as with other areas of weight management • Continued, individualized care • May need greater intensity of intervention in challenging time • No empirically superior diet approach
Diet patterns associated with weight maintenance in other treatments	• Breakfast consumption • Regular self-monitoring • Increased vegetable consumption • Increased fiber consumption
Weight gain is expected with discontinuation of the medication	• No evidence that dietary intervention prevents weight gain • Potential for slowing rate and amount

Almandoz JP, et al. *Obesity (Silver Spring).* 2024;32(9):1613-1631; Paixão, Catarina, et al. "Successful weight loss maintenance: a systematic review of weight control registries." *Obesity reviews* 21.5 (2020): e13003.

How do we fill the guideline gaps for now?

Research Outcomes

Weigh with Research Hierarchy

- RCTs
- Cohort
- Case-Control

Clinical Expertise

Pull from Other Areas

- Bariatric Surgery
- Behavioral Intervention
- Other Medications

Patient Reports

Listen to Your Patients

- Survey Reports
- Clinical Feedback

Available Resources

Use Published Best Practices

- Almandoz et al.
- Gigliotti et al.

Conclusion

Some people are experiencing large weight losses with and without intensive nutrition support

- Does not mean nutrition has no place
- Role may be shifting compared to other treatments

We don’t yet know the empirically ideal role of nutrition and intensive behavior therapy in obesity medications

- We can pull from other nutrition recommendations in the interim
- Individualize care while being transparent about lack of standardization
- Shift from quantity to quality

Stay on top of future research

- Diet quality
- Micronutrient assessment, intervention, and monitoring
- Who may need care escalation

?

Questions?

Save the Date!

June 4th
Advance and Enhance the Unique Role of the RDN in Today's and Tomorrow's Obesity Care Continuum
Registration open now!

All webinars will be recorded and archived for free on-demand viewing.

Thank you!

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