Using Mindful Eating with GLP-1 Medications

A webinar with
Megrette Fletcher,
M.Ed, RDN, CDCES

skelly
SKILLS
Building
Better
Dietitians

Disclosure to Participants

Notice of Requirements For Successful Completion

Please refer to learning goals and objectives

Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

Conflict of Interest (COI) and Financial Relationship Disclosures

Megrette Fletcher, M.Ed, RDN, CDCES is the author of *Core Concepts of Mindful Eating, Discover Mindful Eating, Discover Mindful Eating for Kids,* and *Weight Neutral Diabetes Counseling and Education Activities,* and she receives royalties from Skelly Skills. She receives royalties from Am I Hungry, LLC. She is the owner of the free newsletter *Inclusive Diabetes Care* and the owner of *No Weight Loss Required,* a weight-inclusive newsletter for people trying to prevent or manage diabetes.

Sara Garbin is employed by Skelly Skills.

skelly SKILLS
Building Better Dietitians

About Megrette

Megrette Fletcher, M.Ed, RDN, CDCES is a public speaker and author of five books, including *Diabetes Education and Counseling Activities* and *Core Concepts in Mindful Eating: Professional Edition, Discover Mindful Eating, and The Core Concepts of Mindful Eating*. She is a registered dietitian and diabetes care and education specialist. She currently works at Nourish and writes a newsletter called *No Weight Loss Required*, which is available on Substack. Megrette has maintained a daily meditation practice since 1999.

To learn more about Megrette, visit her website at Megrette.com.

skelly SKILLS
Building Better Dietitians

Learning Objectives

At the conclusion of this webinar, the learner will be able to:

1. List the two types of glucagon-like peptide-1 (GLP-1) medications approved for weight loss
2. Describe the proposed mechanism of action for GLP-1s and glucose-dependent insulinotropic peptide (GIP) medications
3. Explain where GLP receptors are found
4. List three data points on efficacy outcomes of GLP-1s
5. List five main side effects of GLP-1s
6. Explain the relationship between GLP dose and side effects
7. Describe what mindful eating is and how it can be used to help optimize nutritional status and ameliorate side effects of GLP-1s
8. List three pieces of motivational interviewing (MI) dialogue to help assess the impact of a GLP-1 to inform counseling focus

skelly SKILLS
Building Better Dietitians

Meet Sarah

She is considering starting a GLP-1 RA medication.

skelly SKILLS
Building Better Dietitians

Poll Question

What could be the metabolic and endocrine reasons why a GLP-1 RA would be the best choice for Sarah?

a) Pre-diabetes with BMI less than 30
b) Renal disease
c) Asthma
d) Cosmetic reasons
e) Diabetes

skelly SKILLS
Building Better Dietitians

FDA Approved

- Diabetes
- Cardiovascular risk reduction
- Metabolic Dysfunction Associated Steatotic Liver Disease (MASLD)
- Sleep apnea
- Weight loss

(Sheth, K. et al., 2025; U.S. FDA, 2024)

skelly SKILLS
Building Better Dietitians

Non-Approved FDA Uses

- Pre-diabetes with BMI <30
- PCOS
- Renal disease
- Cosmetic use

(Al-Qaaneh, A. M. et al., 2025; Boye, K. S. et al., 2018; Sasaki, T. et al., 2025; Śledziewska, A. M. et al., 2025; Yanto, T. A. et al., 2024)

skelly SKILLS Building Better Dietitians

Generic Name	Brand Name	Class	Route	Approved For
Semaglutide	Ozempic®	GLP-1	Injection	Type 2 Diabetes/CVA
Semaglutide	Wegovy®	GLP-1	Injection	Weight loss, **MASLD/MASH**
Semaglutide	Rybelsus®	GLP-1	Oral	Type 2 Diabetes
Tirzepatide	Mounjaro®	GIP/GLP-1	Injection	Type 2 Diabetes
Tirzepatide	Zepbound®	GIP/GLP-1	Injection	Weight loss/ **Sleep Apnea**
Liraglutide	Victoza®	GLP-1	Injection	Type 2 Diabetes/CVA
Liraglutide	Saxenda®	GLP-1	Injection	Weight loss
Dulaglutide	Trulicity®	GLP-1	Injection	Type 2 Diabetes/CVA
Exenatide	Byetta®	GLP-1	Injection	Type 2 Diabetes
Exenatide	Bydureon®	GLP-1	Injection	Type 2 Diabetes
Lixisenatide	Adlyxin®	GLP-1	Injection	Type 2 Diabetes
Orforglipron	—	GLP-1 (in development)	Oral	T2DM/Obesity (trial phase)

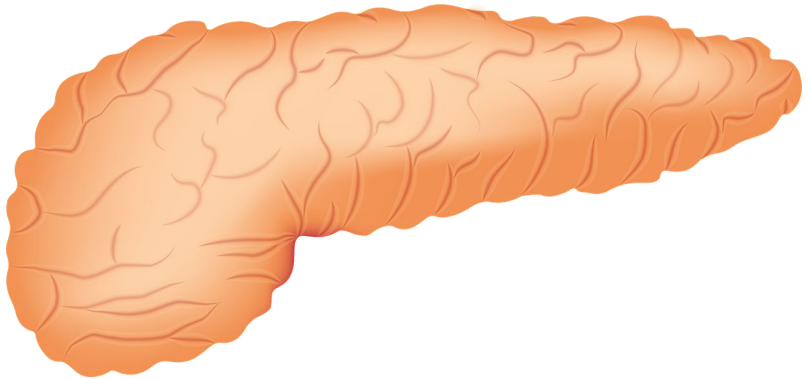
(Drugs.com., n.d.)

skelly SKILLS Building Better Dietitians

Where are GLP-1 receptors found in the body?

GLP-1 receptors (GLP-1 R) are found in a variety of tissues throughout the body, with distribution confirmed by advanced molecular & imaging techniques

- Pancreas
- Brain & nervous system
- Gastrointestinal tract
- Cardiovascular system
- Kidneys
- Other tissues (low or controversial expression)



GLP-1 receptors are especially concentrated in the pancreas (beta-cells), brain, select gut neurons & immune cells, heart, certain blood vessels, & some kidney vascular cells, supporting both metabolic & non-metabolic effects across multiple organ systems.

(McLean et al., 2021)

skelly SKILLS Building Better Dietitians

GLP-1 RA Medications Are Not Just for Weight Loss

GLP-1 RAs are approved for:

- Diabetes
- Cardiovascular risk reduction
- Metabolic Dysfunction Associated Steatotic Liver Disease (MASLD)
- Sleep apnea
- Weight loss

The dose of these medications vary & the outcomes being measured are not exclusive to weight change.

They can include:

- A1C or Time in Range (TIR)
- Cholesterol/lipid panel
- Liver enzymes/imaging
- Apnea-Hypopnea Index & oxygen saturation

(Blackman et al., 2016; Loomba et al., 2024; Malhotra et al., 2024; Marso et al., 2016; Newsome et al., 2021; Wilding et al., 2021)

skelly SKILLS Building Better Dietitians

Diagnosis-Specific Doses of GLP-1 RA Medication

Drug	Indication	Dose (Once Weekly)	Titration
Wegovy	MASH, weight loss, CV risk	2.4 mg	0.25 → 0.5 → 1 → 1.7 → 2.4 mg
Ozempic	Type 2 diabetes, CV risk	0.5–2 mg	0.25 mg x4wk, then up to 0.5/1/2 mg
Zepbound	Weight loss	5–15 mg	2.5 → 5 → 7.5 → 10 → 12.5 → 15 mg
Zepbound	Sleep apnea	10 or 15 mg	2.5 mg increments every 4 weeks

Wegovy doses (Wilding et al., 2021), Ozempic doses (Marso et al., 2016), Zepbound doses (Jastreboff et al., 2022; Malhotra et al., 2024)

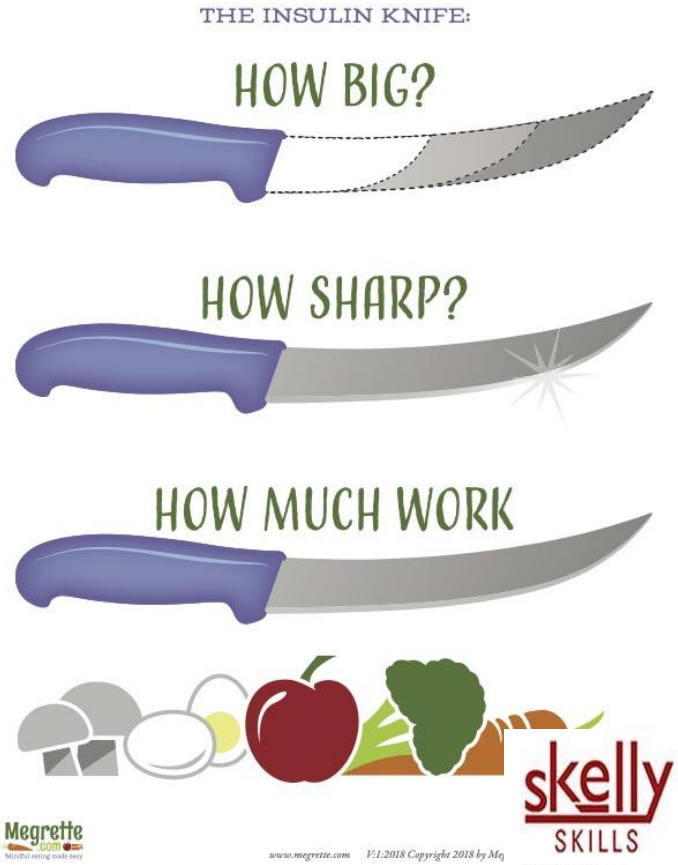
skelly SKILLS
Building Better Dietitians

Explaining How GLP-1 RA Medications Work

skelly SKILLS
Building Better Dietitians

Insulin Production

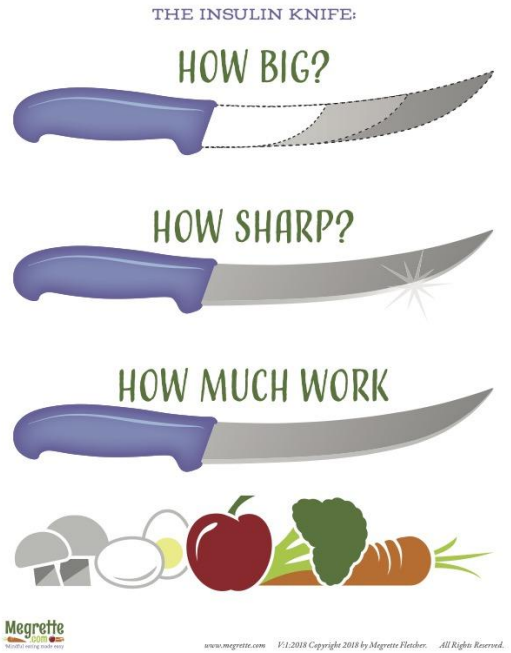
- Insulin acts as a “knife” to help cut up glucose, making it easier for the body’s cells to use it as energy.
- When the body doesn’t make enough insulin, **the “knife” isn’t big enough to handle the job**
  - this often happens after years of insulin resistance, once the pancreas becomes tired.
- Medications like **GLP-1 RAs make a bigger knife** by helping the pancreas produce more insulin.



(Fletcher, M., 2018/2023)

Insulin Resistance Analogy: A Dull Knife

- Early in the process, it's not the size but the sharpness of the insulin knife that matters: **insulin resistance means the insulin knife is too dull to work well**.
- Some people are born with "dull knives," so insulin resistance & energy imbalance can appear even without weight changes.
- Lifestyle factors: A diet high in saturated fat, limited activity, poor sleep, stress, environmental exposures can also dull the insulin knife.

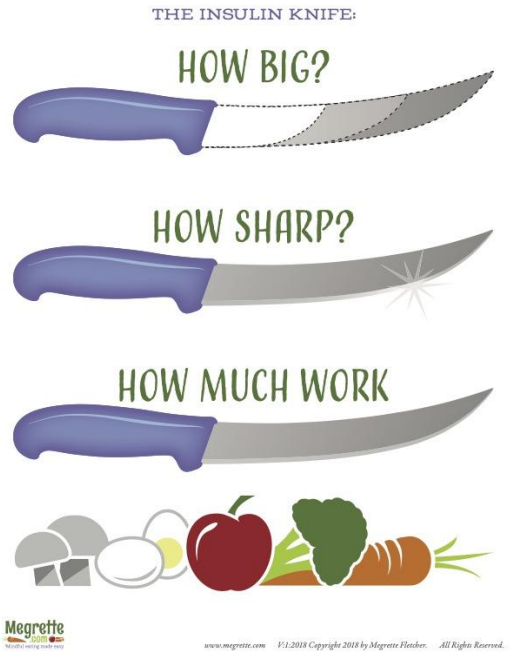


(Fletcher, M., 2018/2023)

skelly SKILLS Building Better Dietitians

Insulin Resistance: Inflammation

- When the “knife” gets dull, the body tries to compensate by making more knives (producing more insulin), but this can cause more clutter, fatigue, & inflammation over time.
- If glucose can’t move from the blood into your cells, the cells lack fuel, creating fatigue.
- **High levels of insulin in the body is linked with other health conditions including heart disease, MASLD, inflammation, & weight gain**.

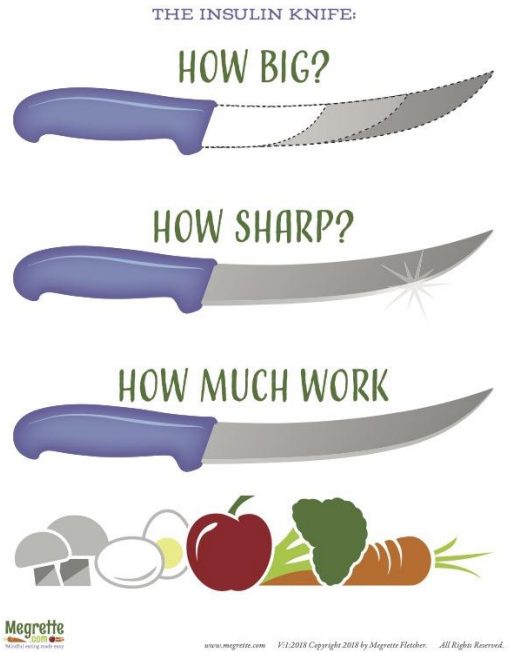


(Fazio, S. et al., 2024; Fletcher, M., 2018/2023; Janssen J. A. M. J. L., 2021; Liao, N. H. et al., 2025; Wiebe, N. et al., 2021)

skelly SKILLS Building Better Dietitians

Lifestyle Changes: How Much Work

- The total amount of carbohydrates & protein impact workload. IE: 180 vs 90
- Pairing of macronutrients impacts workload. IE: Carbs + Protein
- Distribution & meal size impacts workload. IE: Eating 1 or 5 small meals a day.
- The amount of fiber (which delays gastric emptying) impacts workload. IE: Eating a diet higher in fiber & lower in processed foods.

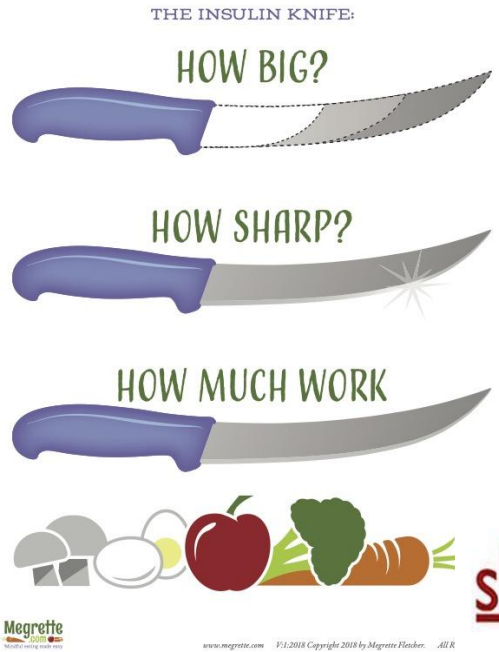


(Fletcher, M., 2018/2023)

skelly SKILLS Building Better Dietitians

How GLP-1 RAs Help

- GLP-1 RAs stimulate insulin production, preserving the size of the insulin knife.
- GLP-1 RAs ↓ insulin resistance, keeping the insulin knife sharp. Less insulin resistance improves the body's function (referred to as insulin signaling)
- GLP-1 RAs impact appetite, & non-hunger eating, ↓ the work for the smaller, duller knife.
- GLP-1 RAs can ↓ inflammation, ↓ variables associated with chronic illness & may make it easier for individuals to move & engage in consistent activity, which keeps the insulin knife sharp, & ↓ workload.



(Fletcher, M., 2018/2023)

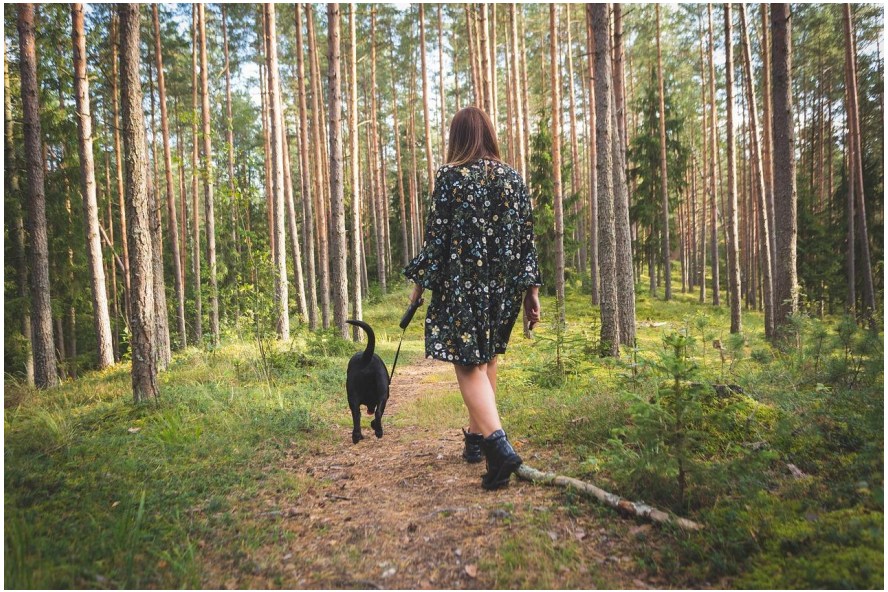
skelly SKILLS Building Better Dietitians

Poll Question

Approximately how many clients have you worked with who are using a GLP-1 RA for weight loss?

a) 0 to 10
b) 10 to 30
c) 30 to 60
d) 60 or more

skelly SKILLS
Building Better Dietitians



GLP-1 RA Side Effects & Outcomes

skelly SKILLS
Building Better Dietitians

GLP-1 RAs: Common Side Effects & Considerations

- Nausea, constipation, diarrhea, bloating, fatigue. This is usually mild and improves over time.
- Reported adverse GI events range from 40-70% of treated patients

Emotional & Mental Health Effects

- Possible increased anxiety, irritability
- Rare reports of suicidal thoughts (under FDA review)

(Gorgojo Martínez, J. J., 2025; Jastreboff, A. M. et al., 2022; Mozaffarian et al., 2025; Wharton, 2023)

skelly SKILLS Building Better Dietitians

GLP-1 RAs: Common Side Effects & Considerations (Cont.)

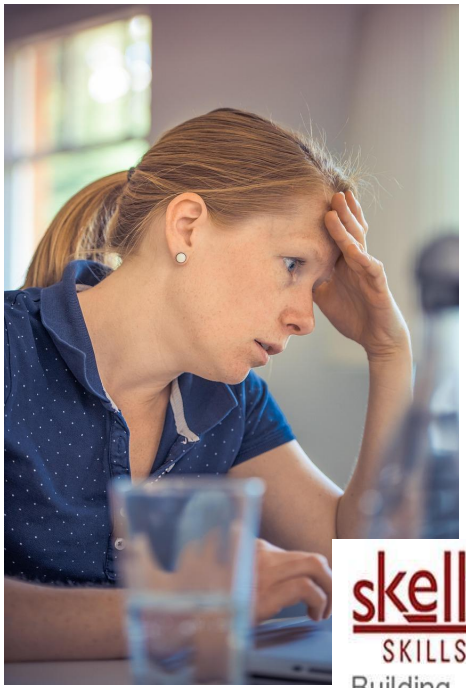
Appetite & Eating Behavior

- Appetite suppression can lead individuals to forget to eat.
- Risk of triggering or worsening disordered eating for those with prior patterns
- Food avoidance & loss of enjoyment can increase isolation and depression due to disconnection from social and cultural aspects of eating

Serious but Less Common Side Effects

- Pancreatitis, gallbladder issues, severe vomiting, gastroparesis (delayed stomach emptying)

Use your comment box to tell us other side effects



(Jastreboff, A. M. et al., 2022; Mozaffarian et al., 2025)

skelly SKILLS Building Better Dietitians

Considerations of GLP-1 RA Medications

- **Lean muscle mass loss:** A systematic review of 6 studies of semaglutide showed lean-mass reductions ranging from **almost 0% up to appx 40% of total weight loss**
- Overall estimates suggest **10-15% of wt loss in females & 20-25% in males** on GLP-1 RAs comes from muscle loss
- **Semaglutide Treatment Effect in People with Obesity (STEP 1 trial):** randomized trial assessed efficacy & safety of weekly subcutaneous semaglutide injections for overweight/obesity management over 68 weeks
  - 86% of participants achieved weight reductions of 5% or more
  - Substudy of 140 participants assessed body composition
    - Group participants lost appx 15% of body weight, with appx 19.3% ↓ in total fat mass, appx 27.4% ↓ in regional visceral fat mass & appx 9.7% ↓ in lean body mass. Total lean body mass relative to total body mass ↑ by 3%, showing **an improvement in lean body mass: fat mass ratio.**

(Anyiam et al., 2025; Bikou A. et al., 2024; Mechanick, J. I. et al., 2025; Mozaffarian et al., 2025; Neeland, I. J. et al., 2024; Prado, C. M. et al., 2018, 2022; Wilding, J. P. H. et al., 2021a, 2021b)

skelly SKILLS Building Better Dietitians

Considerations of GLP-1 RA Medications (Cont.)

- **Lean muscle mass loss** can lead to weight cycling & ↓ functional & metabolic health
- **Weight cycling:**
  - Weight regain after ending treatment may be disproportionately composed of adipose tissue, which is less metabolically active, leading to reduced energy expenditure → contributes to weight cycling
  - More common in young & middle-aged women
  - Severe weight cycling associated with ↑ risk of muscle loss & sarcopenic obesity
- **Sarcopenic obesity:** reduced fat-free mass with excess adiposity

(Anyiam et al., 2025; Bays, H. E. et al, 2022; Donini, L. M. et al., 2022; Mechanick, J. I. et al., 2025; Mozaffarian et al., 2025; Neeland, I. J. et al., 2024; Pellegrini, M. et al., 2022; Rossi, A. P. et al., 2019; Wilding, J. P. H. et al., 2021a, 2021b)

skelly SKILLS Building Better Dietitians

Considerations of GLP-1 RA Medications (Cont.)

- **Higher Risk in Older Adults and Chronic Disease:** Older adults with type 2 diabetes, chronic kidney disease, liver disease, and other comorbidities are particularly at risk for muscle loss when using GLP-1 RAs. ***Sarcopenia prevalence*** *is higher in elderly patients with diabetes, making this a critical population for monitoring.*
- **Impact on Muscle Strength and Function:** While GLP-1 RAs like semaglutide may initially improve muscle function by reducing intramuscular fat infiltration, long-term use has been associated with gradual muscle mass loss that can diminish these functional gains.

(Anyiam et al., 2025; Ceasovschih, A. et al., 2025; Gigliotti,L. et al., 2025; Mozaffarian et al., 2025; Yuan & Larsson, 2023)

skelly SKILLS Building Better Dietitians

GLP-1 RA Medications: Individualized Nutrition Recommendations

- **Individual Variability and Need for Intervention:** Baseline muscle mass and physical activity levels are important predictors of muscle loss risk. Resistance training and optimized protein intake may help mitigate sarcopenia risks during GLP-1 RA therapy.
- **Heterogeneity of Effects:** Clinical trials report variable effects of GLP-1 therapies on lean body mass changes, suggesting that patient-specific factors influence outcomes.
- **Sarcopenia vs. Frailty:** Some studies indicate that despite weight loss-induced muscle mass reduction, there is no strong evidence linking GLP-1–based medications to physical frailty or sarcopenia severe enough to cause disability, providing some reassurance.

(Ceasovschih, A. et al., 2025; Jiao, R. et al., 2025; Mozaffarian et al., 2025; Mechanick, J. I. et al., 2025; Memel, Z. et al., 2025; Scheen A. J., 2025)

skelly SKILLS Building Better Dietitians

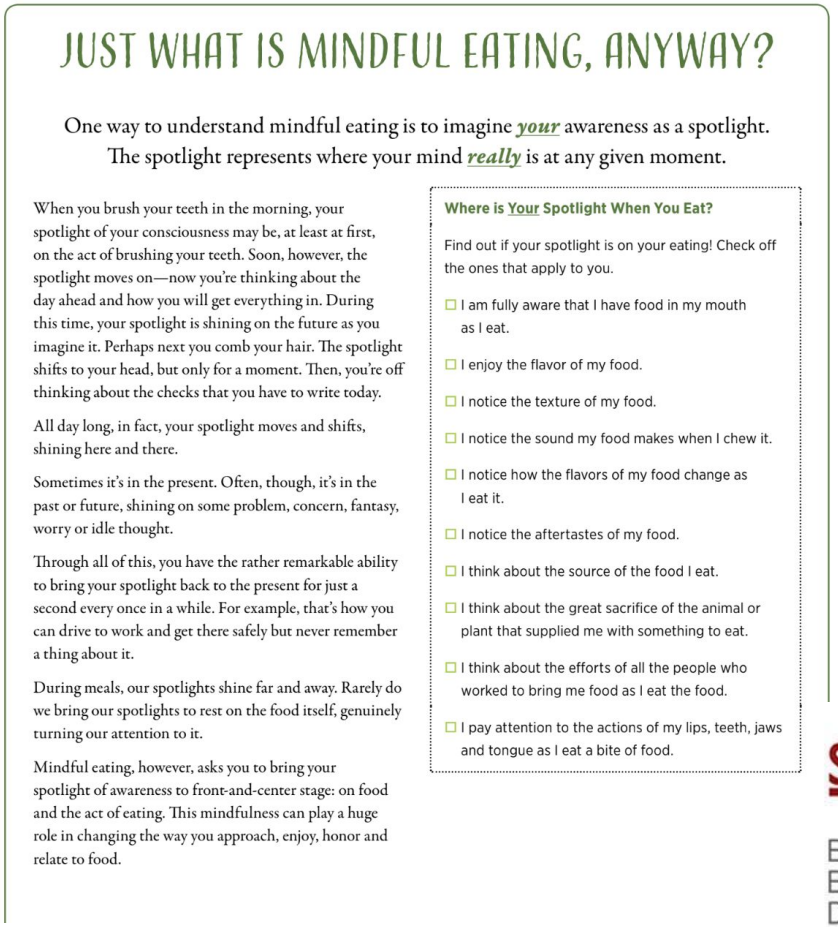
What is Mindful Eating?

skelly SKILLS
Building Better Dietitians

What is Mindful Eating Anyway?

- Think of mindfulness as a mental spotlight.
- Most times the spotlight is shining on the past, or the future.
- Mindful eating is about becoming aware of your direct experience in the present moment.

(Fletcher, M., 2019)



JUST WHAT IS MINDFUL EATING, ANYWAY?

One way to understand mindful eating is to imagine ***your*** awareness as a spotlight. The spotlight represents where your mind ***really*** is at any given moment.

When you brush your teeth in the morning, your spotlight of your consciousness may be, at least at first, on the act of brushing your teeth. Soon, however, the spotlight moves on—now you're thinking about the day ahead and how you will get everything in. During this time, your spotlight is shining on the future as you imagine it. Perhaps next you comb your hair. The spotlight shifts to your head, but only for a moment. Then, you're off thinking about the checks that you have to write today.

All day long, in fact, your spotlight moves and shifts, shining here and there.

Sometimes it's in the present. Often, though, it's in the past or future, shining on some problem, concern, fantasy, worry or idle thought.

Through all of this, you have the rather remarkable ability to bring your spotlight back to the present for just a second every once in a while. For example, that's how you can drive to work and get there safely but never remember a thing about it.

During meals, our spotlights shine far and away. Rarely do we bring our spotlights to rest on the food itself, genuinely turning our attention to it.

Mindful eating, however, asks you to bring your spotlight of awareness to front-and-center stage: on food and the act of eating. This mindfulness can play a huge role in changing the way you approach, enjoy, honor and relate to food.

Where is Your Spotlight When You Eat?

Find out if your spotlight is on your eating! Check off the ones that apply to you.

- ☐ I am fully aware that I have food in my mouth as I eat.
- ☐ I enjoy the flavor of my food.
- ☐ I notice the texture of my food.
- ☐ I notice the sound my food makes when I chew it.
- ☐ I notice how the flavors of my food change as I eat it.
- ☐ I notice the aftertastes of my food.
- ☐ I think about the source of the food I eat.
- ☐ I think about the great sacrifice of the animal or plant that supplied me with something to eat.
- ☐ I think about the efforts of all the people who worked to bring me food as I eat the food.
- ☐ I pay attention to the actions of my lips, teeth, jaws and tongue as I eat a bite of food.

skelly SKILLS
Building Better Dietitians

Just What is Mindful Eating, Anyway? Questions

- I am fully aware that I have food in my mouth as I eat.
- I enjoy the flavor of my food.
- I notice the texture of my food.
- I notice the sound my food makes when I chew it.
- I notice how the flavors of my food change as I eat it.
- I notice the aftertastes of my food
- I think about the source of the food I eat.
- I think about the great sacrifice of the animal or plant that supplied me with something to eat.
- I think about the efforts of all the people who worked to bring me food as I eat the food.
- I pay attention to the actions of my lips, teeth, jaws and tongue as I eat a bite of food.

(Fletcher, M., 2019)

skelly SKILLS Building Better Dietitians

Using Motivational Interviewing & Mindful Eating

- Eating is hard because of the nausea, so it is easier to eat quickly but that only makes it worse.
- You want to notice the flavor when eating but your lack of appetite feels like a barrier.
- You are thinking about the type/source of the food you eat and you're getting curious how to …(reduce, decrease, increase XYZ)
- A lot of people worked to bring you this food and you don't want to waste it.

- The wish is to be more aware when you're eating but you aren't sure how to slow down with such a busy life.
- In the past eating was used to escape feelings. Now you want eating to be more enjoyable.
- It is hard to notice the taste and texture of the bite when you have always been focused on losing weight..

(Fletcher, M., 2019; Miller & Rollnick, 2023)

skelly SKILLS
Building Better Dietitians

Measuring Progress

- Mindful eating is about remaining present, instead of getting pulled in to the past or future.
- This handout is trying to understand your client's direct experience by creating a complex reflection.
- This handout could be used to paint a picture of what eating mindfully might look like.

(Fletcher, M., 2019)

MEASURING PROGRESS

Mindful eating is a process of discovery that continues throughout your entire life. From time to time, it's nice to take a look at where you are, where you were and how far you've come.

On the diagram below, put an X on each line that indicates where you are today. Use an ink pen to make your X's.

Then, put a pencil mark where you'd like to be the next time you visit this diagram.

On later visits to this handout, use a different ink color!

	1 2 3 4 5 6 7 8 9 10	
I don't think about food; I just react to it.		I am aware that food is a choice I make.
I stop eating when the food runs out.		I'm aware of how much food my body needs.
Typically I eat more when I am emotionally upset or happy.		Typically my emotions don't override my fullness cue to stop eating.
I eat very rapidly.		I eat at a comfortable pace.
I use food for all sorts of things other than nutrition.		I use food for nutrition and health.
During meals, my mind is on all sorts of things.		During meals, my mind is on food and act of eating.
I eat out of habit.		I eat out of choice.
	1 2 3 4 5 6 7 8 9 10	

skelly SKILLS Building Better Dietitians

The *Measuring Progress* Handout

I don't think about food; I just react to it. →	I am aware that food is a choice I make.
I stop eating when the food runs out. →	I'm aware of how much food my body needs.
Typically I eat more when I am emotionally upset or happy. →	Typically my emotions don't override my fullness cue to stop eating.
I eat very rapidly. →	I eat at a comfortable pace.
I use food for all sorts of things other than nutrition. →	I use food for nutrition and health.
During meals, my mind is on all sorts of things. →	During meals, my mind is on food and the act of eating.
I eat out of habit. →	I eat out of choice.

(Fletcher, M., 2019)

skelly SKILLS
Building Better Dietitians

Using MI for this Handout

Using MI is about pulling for the desired change.

- *You want to be more aware of the food choices you make.*
- *Eating with more awareness would help you change your diet.*
- *You want to know how much food your body needs.*
- *You want to eat at a comfortable pace.*
- *You want to choose foods that nourish and support health.*

(Miller & Rollnick, 2023)

skelly SKILLS Building Better Dietitians

Hunger and Fullness (H/F) Scale

This scale is curious about the client's direct experience vs recognizing a specific sense of hunger or fullness

(Fletcher, M., 2019)

skelly SKILLS Building Better Dietitians

How to Introduce H/F Scale

Ask the client to look at the H/F scale. “What do you notice?”

- The scale is mirrored meaning that it is the mirror image of each side.
- Hunger decreases with each bite.
- Fullness increases with each bite.
- The colors change with the change in experience.
- The scale is focusing on the client’s comfort/discomfort not on a specific sensation of hunger or fullness.

(Fletcher, M., 2019)

skelly SKILLS Building Better Dietitians

Mindful Eating

- It helps redirect the client to the present moment where change is possible.
- Is something that you practice. It isn't something that is 'done.'
- Can be used to clarify the client's 'dream' which is often clouded by judgment, diet culture and the desire to be right vs engage in self-kindness.
- Can help you reflect the desire and or conflict they are facing (reflection)
- Can help the client refocus on their experience vs an outcome.

(Fletcher, M., 2019)

skelly SKILLS Building Better Dietitians

Case Study: Amber

Amber was a grade school teacher who was trying a GLP-1 RA to lose weight. She also wanted to address her relationship with food.

To do this, Amber started to log her meals using a tool that the RD/RDN could see.

This app allowed Amber to rate her hunger and fullness, as well as provide some free-text comments.

skelly SKILLS
Building Better Dietitians

Amber

Amber was not clear on what hunger and fullness were, and wanted to start with writing down her ‘why.’. Why was she eating? Why did she choose this food?

Amber started with and became clear on her intention, her “Why”

The more Amber, ‘checked in’ prior to meals with her intention, the more insight she gained.

This insight also increased her motivation.

She was able to recognize the following reasons why she was eating.

skelly SKILLS
Building Better Dietitians

Amber

- Didn’t want to waste food if the food was free
- Wanted to use up leftovers
- Was bored, upset, lonely
- If it was in the house (food noise)
- If she liked the taste (cravings)
- If she wanted to nourish her body
- If she thought that the food would feel good in her body (nausea)
- If she wanted to feel more energy after eating
- If she wanted to eat/cook something new

skelly SKILLS
Building Better Dietitians

Amber

- The more curious Amber was about her **why**, the more curious Amber was about *Amber*.
- After writing down her “Why” (which was something she did when logging food) Amber also wanted to not ‘overeat’ *because it didn’t feel good in her body*.
- Her **Why** wasn’t because she can’t or wasn’t allowed. It wasn’t because she can “only” have X number of calories.
- *Amber’s intention was to enjoy eating.* We focused on eating balanced meals (3 colors, 3 textures) The more she looked at her why, the clearer it became that overeating decreased her enjoyment.

skelly SKILLS
Building Better Dietitians

Case Study: Nick

- Nick is a social worker who is on a GLP-1 RA for diabetes and to lose weight but realizes that his relationship with food also needs to change.
- Nick started on the GLP-1 RA and felt that he had no understanding of hunger or fullness.

skelly SKILLS
Building Better Dietitians

Nick

- Used the H/F scale (see image)
- The H/F scale was used to explain that taking GLPs often decrease the sensation of hunger and increase the sensation of fullness.
- Being able to notice a comfortable level of hunger and respond is a skill that has many benefits.
- Including: being able to adjust your portions and decrease the intake of saturated fat, which improves insulin resistance and glucose levels.

skelly SKILLS
Building Better Dietitians

Nick

- He could see that he was eating specific foods and amounts out of habit.
- He became more aware of his fullness and realized that he didn't need to be 'that' full because his hunger was so much less than previous.
- Nick wasn't interested in understanding his deeper motives. Instead, Nick realized that he needed to eat more often because he got full so fast there was no way for him to meet his nutritional goals.
    - Specifically protein which was >120 g per day and fiber 35 g
- He noticed when he ate a lot of meat, he couldn't get his fiber needs met.

skelly SKILLS
Building Better Dietitians

Summary

- There is a varied mechanism of action for GLP-1 RAs and GIPs
- GLP receptors are found in many places in the body
- Long-term efficacy for weight loss is unknown
- The 5 main side effects of GLP-1 RAs: Nausea, constipation, diarrhea, bloating, fatigue
- GLP dose can change due to dx it is used for or to reduce side effects
- Mindful eating can be used to help optimize nutritional status and ameliorate side effects of GLP-1 RAs by helping clients notice their direct experience, to increase intrinsic motivation, and increase food enjoyment.
- Mindful eating can also be used to create effective MI reflections and open-ended questions to facilitate effective counseling.

(Fletcher, M., 2019; Mozaffarian et al., 2025; Gorgojo-Martínez et al., 2023)

skelly SKILLS Building Better Dietitians

Questions?

skelly SKILLS
Building Better Dietitians

References

1. Al-Qaaneh, A. M., Qunaibi, E. A., Al-Fraihat, N. A., Abu-Aisheh, B. E., Rabea, S., Al Aloul, A. A., Matahen, R., & Annabi, F. O. (2025). Real-World Off-Label Use of Semaglutide for Weight Reduction: User Behavior, Effectiveness, and Satisfaction. *Patient preference and adherence*, *19*, 3373–3385. https://doi.org/10.2147/PPA.S549716
2. Altobaishat, O., Gadelmawla, A. F., Balbaa, E., Turkmani, M., & Abouzid, M. (2025). Safety and efficacy of glucagon-like peptide-1 receptor agonists in patients with obstructive sleep apnea: A systematic review and meta-analysis of randomized controlled trials. *European Clinical Respiratory Journal*, *12*(1), 2484048. https://doi.org/10.1080/20018525.2025.2484048
3. Anyiam, O., Idris, I., & [Additional authors]. (2025). How do glucagon-like peptide-1 receptor agonists affect measures of muscle mass in adults with overweight or obesity: A systematic review and meta-analysis. *Obesity Reviews*, [in press]. https://doi.org/10.1111/obr.13916
4. Armstrong, M. J., Gaunt, P., Aithal, G. P., Barton, D., Hull, D., Parker, R., Hazlehurst, J. M., Guo, K., Abouda, G., Aldersley, M. A., Stocken, D., Gough, S. C., Tomlinson, J. W., Brown, R. M., Hübscher, S. G., & Newsome, P. N. (2016). Liraglutide safety and efficacy in patients with non-alcoholic steatohepatitis (LEAN): A multicentre, double-blind, randomised, placebo-controlled phase 2 study. *The Lancet*, 387(10019), 679–690. https://doi.org/10.1016/S0140-6736(15)00803-X
5. Bays, H. E., Golden, A., & Tondt, J. (2022). Thirty Obesity Myths, Misunderstandings, and/or Oversimplifications: An Obesity Medicine Association (OMA) Clinical Practice Statement (CPS) 2022. *Obesity pillars*, *3*, 100034. https://doi.org/10.1016/j.obpill.2022.100034
6. Bikou A, Dermiki-Gkana F, Penteris M., Constantinides T.K., Kontogiorgis C. (2024). A systematic review of the effect of semaglutide on lean mass: insights from clinical trials. *Expert opinion on pharmacotherapy, 25*(5), 611-619.https://pubmed.ncbi.nlm.nih.gov/38629387/
7. Blackman, A., Foster, G. D., Zammit, G., Rosenberg, R., Aronne, L., Wadden, T., Claudius, B., Jensen, C. B., & Mignot, E. (2016). Effect of liraglutide 3.0 mg in individuals with obesity and moderate or severe obstructive sleep apnea: The SCALE sleep apnea randomized clinical trial. *International Journal of Obesity*, 40(8), 1310–1319. https://doi.org/10.1038/ijo.2016.52
8. Boye, K. S., Botros, F. T., Haupt, A., & others. (2018). *Glucagon-like peptide-1 receptor agonist use and renal impairment: A retrospective analysis of an electronic health records database in the U.S. population. Diabetes Therapy, 9*(2), 637–650. https://doi.org/10.1007/s13300-018-0377-5

skelly SKILLS Building Better Dietitians

References (Cont.)

8. Buscemi, C., Randazzo, C., Barile, A. M., Bo, S., Ponzo, V., Caldarella, R., Malavazos, A. E., Caruso, R., Colombrita, P., Lombardo, M., & Buscemi, S. (2024). Factors associated with body weight gain and insulin-resistance: A longitudinal study. *Nutrition and Diabetes, 14*, Article 21. https://doi.org/10.1038/s41387-024-00283-5
9. Ceasovschih, A., Asaftei, A., Lupo, M. G., Kotlyarov, S., Bartušková, H., Balta, A., Sorodoc, V., Sorodoc, L., & Banach, M. (2025). Glucagon-like peptide-1 receptor agonists and muscle mass effects. *Pharmacological research*, *220*, 107927. https://doi.org/10.1016/j.phrs.2025.107927
10. Dong, S., & Sun, C. (2022). Can glucagon-like peptide-1 receptor agonists cause acute kidney injury? An analytical study based on post-marketing approval pharmacovigilance data. Frontiers in Endocrinology, 13, 1032199. https://doi.org/10.3389/fendo.2022.1032199
11. Donini, L. M., Busetto, L., Bischoff, S. C., Cederholm, T., Ballesteros-Pomar, M. D., Batsis, J. A., ... & Barazzoni, R. (2022). Definition and diagnostic criteria for sarcopenic obesity: ESPEN and EASO consensus statement. *Obesity facts*, *15*(3), 321-335.
12. Drugs.com. (n.d.). *GLP-1 receptor agonists (incretin mimetics) – list of brands & generics*. Retrieved November 10, 2025, from https://www.drugs.com/drug-class/glp-1-receptor-agonists.html
13. Fazio, S., Mercurio, V., Tibullo, L., Fazio, V., & Affuso, F. (2024). Insulin resistance/hyperinsulinemia: an important cardiovascular risk factor that has long been underestimated. *Frontiers in cardiovascular medicine*, *11*, 1380506. https://doi.org/10.3389/fcvm.2024.1380506
14. Ferhatbegovic, L., Mršić, D., & Mačić-Džanković, A. (2023). The benefits of GLP1 receptors in cardiovascular diseases. *Frontiers in Clinical Diabetes and Healthcare*, 4, 1293926. https://doi.org/10.3389/fcdhc.2023.1293926
15. Fletcher, M. (2019). *Discover mindful eating: A step-by-step guide to using 50 mindful eating activities with your clients* (2nd ed.). Skelly Skills.
16. Fletcher, M. (2018/2023). *Weight Neutral Diabetes Counseling and Educational Activities: Helping Clients Without Harping on Weight.* [Self-published via Megrette.com]

skelly SKILLS
Building Better Dietitians

References (Cont.)

17. Gerstein, H. C., Colhoun, H. M., Dagenais, G. R., Diaz, R., Lakshmanan, M., Pais, P., Probstfield, J., Riesmeyer, J. S., Riddle, M. C., Rydén, L., Xavier, D., Atisso, C. M., Dyal, L., Hall, S., Rao-Melacini, P., Wong, G., Avezum, A., Basile, J., Chung, N., . . . REWIND Investigators. (2019). Dulaglutide and cardiovascular outcomes in type 2 diabetes (REWIND): A double-blind, randomised placebo-controlled trial. *The Lancet*, 394(10193), 121–130. https://doi.org/10.1016/S0140-6736(19)31149-3
18. Gerstein, H. C., Sattar, N., Rosenstock, J., Ramasundarahettige, C., Pratley, R., Lopes, R. D., Lam, C. S. P., Khurmi, N. S., Heenan, L., Del Prato, S., Dyal, L., Branch, K., Gasevic, D., Angelyn Bethel, M., Lakshmanan, M., Pagidipati, N., Schubert, J., Mellbin, L. G., Ohman, P., . . . AMPLITUDE-O Trial Investigators. (2021). Cardiovascular and renal outcomes with efpeglenatide in type 2 diabetes. *New England Journal of Medicine*, 385(10), 896–907. https://doi.org/10.1056/NEJMoa2108269
19. Gigliotti, L., Warshaw, H., Evert, A., Kushner, R. F., Kahan, S., & Kushner, R. (2025). Incretin-based therapies and lifestyle interventions: The evolving role of registered dietitian nutritionists in obesity care. Journal of the Academy of Nutrition and Dietetics, 125(3), 408–421. https://www.jandonline.org/article/S2212-2672(24)00925-0/fulltext
20. Gorgojo Martínez, J. J. (2025, February). *How to improve gastrointestinal tolerance in treatment with GLP-1 receptor agonists* (Vol. 91). *Diabetes Treatments*. https://www.revistadiabetes.org/wp-content/uploads/How-to-Improve-Gastrointestinal-Tolerance-in-Treatment-with-GLP-1-Receptor-Agonists.pdf
21. Gorgojo-Martínez, J. J., Mezquita-Raya, P., Carretero-Gómez, J., Castro, A., Cebrián-Cuenca, A., de Torres-Sánchez, A., García-de-Lucas, M. D., Núñez, J., Obaya, J. C., Soler, M. J., Górriz, J. L., & Rubio-Herrera, M. A. (2023). Clinical recommendations to manage gastrointestinal adverse events in patients treated with Glp-1 receptor agonists: A multidisciplinary expert consensus. *Journal of Clinical Medicine*, *12*(1), 145. https://doi.org/10.3390/jcm12010145
22. Gudzune, K. A., & Kushner, R. F. (2024). New medications for obesity treatment: A new era and new challenges. JAMA, 332(7), 571–584. https://doi.org/10.1001/jama.2024.12065
23. Harrison, S. A., Bedossa, P., Guy, C. D., Schattenberg, J. M., Loomba, R., Taub, R., Labriola, D., Moussa, S. E., Neff, G. W., Gottwald, M. D., Schiff, E. R., Baum, S. J., Francque, S. M., Rushbrook, S. M., Lai, M., Sanyal, A. J., Nnane, I. P., Karabelas, A., Didolkar, V., . . . MAESTRO-NASH Investigators. (2024). A phase 3, randomized, controlled trial of resmetirom in NASH with liver fibrosis. *New England Journal of Medicine*, 390(6), 497–509. https://doi.org/10.1056/NEJMoa2309070

skelly SKILLS Building Better Dietitians

References (Cont.)

24. Hernandez, A. F., Green, J. B., Janmohamed, S., D'Agostino, R. B., Sr., Granger, C. B., Jones, N. P., Leiter, L. A., Rosenberg, A. E., Sigmon, K. N., Somerville, M. C., Thorpe, K. M., McMurray, J. J. V., & Del Prato, S. (2018). Albiglutide and cardiovascular outcomes in patients with type 2 diabetes and cardiovascular disease (Harmony Outcomes): A double-blind, randomised placebo-controlled trial. *The Lancet*, 392(10157), 1519–1529. https://doi.org/10.1016/S0140-6736(18)32261-X
25. Janssen J. A. M. J. L. (2021). Hyperinsulinemia and Its Pivotal Role in Aging, Obesity, Type 2 Diabetes, Cardiovascular Disease and Cancer. *International journal of molecular sciences*, *22*(15), 7797. https://doi.org/10.3390/ijms22157797
26. Jastreboff, A. M., Aronne, L. J., Ahmad, N. N., Wharton, S., Connery, L., Alves, B., Kiyosue, A., Zhang, S., Liu, B., Bunck, M. C., & Kushner, R. F. (2022). Tirzepatide once weekly for the treatment of obesity. New England Journal of Medicine, 387, 205–216. https://doi.org/10.1056/NEJMoa2206038
27. Jiao, R., Lin, C., Cai, X., Wang, J., Wang, Y., Lv, F., Yang, W., & Ji, L. (2025). Characterizing body composition modifying effects of a glucagon-like peptide 1 receptor-based agonist: A meta-analysis. *Diabetes, obesity & metabolism*, *27*(1), 259–267. https://doi.org/10.1111/dom.16012
28. Johnson, J. D. (2021). On the causal relationships between hyperinsulinaemia, insulin resistance, obesity and dysglycaemia in type 2 diabetes. *Diabetologia, 64*(10), 2138–2146. https://doi.org/10.1007/s00125-021-05505-4
29. Liao, N. H., Wang, C. Y., Lai, K. Y., Kao, H. H., Lin, W. Y., & Chen, T. P. (2025). Association between metabolic dysfunction-associated steatotic liver disease and insulin resistance in individuals with normoglycemia. *Medicine*, *104*(34), e44109. https://doi.org/10.1097/MD.0000000000044109
30. Loomba, R., Hartman, M. L., Lawitz, E. J., Vuppalanchi, R., Boursier, J., Bugianesi, E., Yoneda, M., Behling, C., Cummings, O. W., Tang, Y., Brouwers, B., Robins, D. A., Nikooienejad, A., Younes, Z., Rolph, T., Harting, E., Bartizal, K., Hendricks, A., MacDonald, T. J., . . . SYNERGY-NASH Investigators. (2024). Tirzepatide for metabolic dysfunction-associated steatohepatitis with liver fibrosis. *New England Journal of Medicine*, 391(4), 299–310. https://doi.org/10.1056/NEJMoa2401943
31. Miller, W. R., & Rollnick, S. (2023). *Motivational Interviewing: Helping people change and grow* (4th ed.). Guilford Press.

skelly SKILLS
Building Better Dietitians

References (Cont.)

32. Malhotra, A., Grunstein, R. R., Fietze, I., Weaver, T. E., Redline, S., Azarbarzin, A., Sands, S. A., Schwab, R., Dunn, J., Chakladar, S., Bunck, M. C., Bednarik, J., Kist, K., & Blandin de Chalain, T. M. (2024). Tirzepatide for the treatment of obstructive sleep apnea and obesity. *New England Journal of Medicine*, 391(13), 1193–1205. https://doi.org/10.1056/NEJMoa2404881
33. Marso, S. P., Bain, S. C., Consoli, A., Eliaschewitz, F. G., Jódar, E., Leiter, L. A., Lingvay, I., Rosenstock, J., Seufert, J., Warren, M. L., Woo, V., Hansen, O., Holst, A. G., Pettersson, J., Vilsbøll, T., & SUSTAIN-6 Investigators. (2016). Semaglutide and cardiovascular outcomes in patients with type 2 diabetes. *New England Journal of Medicine*, 375(19), 1834–1844. https://doi.org/10.1056/NEJMoa1607141
34. Marso, S. P., Daniels, G. H., Brown-Frandsen, K., Kristensen, P., Mann, J. F., Nauck, M. A., Nissen, S. E., Pocock, S., Poulter, N. R., Ravn, L. S., Steinberg, W. M., Stockner, M., Zinman, B., Bergenstal, R. M., & Buse, J. B. (2016). Liraglutide and cardiovascular outcomes in type 2 diabetes. *New England Journal of Medicine*, 375(4), 311–322. https://doi.org/10.1056/NEJMoa1603827
35. McLean, B. A., Wong, C. K., Campbell, J. E., Hodson, D. J., Trapp, S., & Drucker, D. J. (2021). Revisiting the complexity of GLP-1 action from sites of synthesis to receptor activation. Endocrine reviews, 42(2), 101-132.
36. Mechanick, J. I., Butsch, W. S., Christensen, S. M., Hamdy, O., Li, Z., Prado, C. M., & Heymsfield, S. B. (2025). Strategies for minimizing muscle loss during use of incretin-mimetic drugs for treatment of obesity. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, *26*(1), e13841. https://doi.org/10.1111/obr.13841
37. Medical Students for Size Inclusivity (MSSI). (2023). GLP-1 informed consent document. https://sizeinclusivemedicine.org/wp-content/uploads/2023/11/MSSI-GLP1-Informed-Consent-1-1.pdf
38. Memel, Z., Gold, S. L., Pearlman, M., Muratore, A., & Martindale, R. (2025). Impact of GLP- 1 Receptor Agonist Therapy in Patients High Risk for Sarcopenia. *Current nutrition reports*, *14*(1), 63. https://doi.org/10.1007/s13668-025-00649-w
39. Mozaffarian, D., Agarwal, M., Aggarwal, M., Alexander, L., Apovian, C. M., Bindlish, S., Bonnet, J., Butsch, W. S., Christensen, S., Gianos, E., Gulati, M., Gupta, A., Horn, D., Kane, R. M., Saluja, T., Samidhi, D., Stanford, F. C., Stanford, K. I., Callahan, E. A., & [Additional authors]. (2025). Nutritional priorities to support GLP-1 therapy for obesity: A joint advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association, and The Obesity Society. *The American Journal of Clinical Nutrition*, [in press]. https://doi.org/10.1016/j.ajcnut.2025.04.023

skelly SKILLS Building Better Dietitians

References (Cont.)

40. Neeland, I. J., Linge, J., & Birkenfeld, A. L. (2024). Changes in lean body mass with glucagon-like peptide-1-based therapies and mitigation strategies. *Diabetes, obesity & metabolism*, *26 Suppl 4*, 16–27. https://doi.org/10.1111/dom.15728
41. Newsome, P. N., Buchholtz, K., Cusi, K., Linder, M., Okanoue, T., Ratziu, V., Sanyal, A. J., Sejling, A. S., & Harrison, S. A. (2021). A placebo-controlled trial of subcutaneous semaglutide in nonalcoholic steatohepatitis. *New England Journal of Medicine*, 384(12), 1113–1124. https://doi.org/10.1056/NEJMoa2028395
42. Newsome, P., Sanyal, A., Kliers, I., Fraessdorf, M., Barreyro, F. J., Anstee, Q. M., Ratziu, V., Harrison, S., Alkhouri, N., Dufour, J. F., Roden, M., & Bosch, J. (2024, November). Phase 3 ESSENCE trial: Semaglutide in metabolic dysfunction-associated steatohepatitis (MASH). Poster presented at the American Association for the Study of Liver Diseases, The Liver Meeting, San Diego, CA.
43. Optimizing GLP-1RAs: A Smarter Approach to Sustainable Weight Loss Impact of Nourish GLP-1 Programs on Clinical Outcomes and Costs White Paper: https://cdn.prod.website-files.com/623de5fee0c46d3440a5ff42/67f7239053158db4e5808405_GLP-1%20Whitepaper_FINAL1.pdf
44. Pellegrini, M., Itani, L., Rossi, A. P., Kreidieh, D., El Masri, D., Tannir, H., & El Ghoch, M. (2022). Approaching Sarcopenic Obesity in Young and Middle-Aged Female Adults in Weight Management Settings: A Narrative Review. *Healthcare (Basel, Switzerland)*, *10*(10), 2042. https://doi.org/10.3390/healthcare10102042
45. Prado, C. M., Landi, F., Chew, S. T. H., Atherton, P. J., Molinger, J., Ruck, T., & Gonzalez, M. C. (2022). Advances in muscle health and nutrition: A toolkit for healthcare professionals. *Clinical nutrition (Edinburgh, Scotland)*, *41*(10), 2244–2263. https://doi.org/10.1016/j.clnu.2022.07.041
46. Prado, C. M., Purcell, S. A., Alish, C., Pereira, S. L., Deutz, N. E., Heyland, D. K., Goodpaster, B. H., Tappenden, K. A., & Heymsfield, S. B. (2018). Implications of low muscle mass across the continuum of care: a narrative review. *Annals of medicine*, *50*(8), 675–693. https://doi.org/10.1080/07853890.2018.1511918
47. Rossi, A. P., Rubele, S., Calugi, S., Caliari, C., Pedelini, F., Soave, F., Chignola, E., Vittoria Bazzani, P., Mazzali, G., Dalle Grave, R., & Zamboni, M. (2019). Weight Cycling as a Risk Factor for Low Muscle Mass and Strength in a Population of Males and Females with Obesity. *Obesity (Silver Spring, Md.)*, *27*(7), 1068–1075. https://doi.org/10.1002/oby.22493

skelly SKILLS
Building Better Dietitians

References (Cont.)

48. Rubino, D., Abrahamsson, N., Davies, M., Hesse, D., Greenway, F. L., Jensen, C., Lingvay, I., Mosenzon, O., Rosenstock, J., Rubio, M. A., Wadden, T. A., Wharton, S., & Wilding, J. P. H. (2021). Effect of continued weekly subcutaneous semaglutide vs. placebo on weight loss maintenance in adults with overweight or obesity: The STEP 4 randomized clinical trial. JAMA, 325(14), 1414–1425. https://doi.org/10.1001/jama.2021.3224
49. Sasaki, T., Giang, S. M., Wu, J., Yokoo, T., Gallagher, M., Bellomo, R., & Wang, A. Y. (2025). The effect of GLP-1 receptor agonists on renal outcomes: a systematic review and meta-analysis. *Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association*, gfaf193. Advance online publication. https://doi.org/10.1093/ndt/gfaf193
50. Sattar, N., Lee, M. M. Y., Kristensen, S. L., Branch, K. R. H., Del Prato, S., Khurmi, N. S., Lam, C. S. P., Lopes, R. D., McMurray, J. J. V., Pratley, R. E., Gerstein, H. C., & Gregg, E. W. (2021). Cardiovascular, mortality, and kidney outcomes with GLP-1 receptor agonists in patients with type 2 diabetes: A systematic review and meta-analysis of randomised trials. *The Lancet Diabetes & Endocrinology*, 9(10), 653–662. https://doi.org/10.1016/S2213-8587(21)00203-5
51. Scheen A. J. (2025). GLP-1-derived therapies and sarcopenia: plea for a specific focus on at risk special populations. *Diabetes & metabolism*, *52*(1), 101708. Advance online publication. https://doi.org/10.1016/j.diabet.2025.101708
52. Sheth, K., Kim, S., Porterfield, L., Virani, S. S., Wadhwani, S., & Vaughan, E. M. (2025). The Expanding Scope of GLP-1 Receptor Agonists: Six Uses Beyond Diabetes. *Current atherosclerosis reports*, *27*(1), 76. https://doi.org/10.1007/s11883-025-01319-6
53. Skurk, T., Bosy-Westphal, A., Grünerbel, A., Kabisch, S., Keuthage, W., Kronsbein, P., Müssig, K., Pfeiffer, A. F. H., Simon, M. C., Tombek, A., Weber, K. S., & Rubin, D. (2022). Dietary recommendations for persons with type 2 diabetes mellitus. *Experimental and Clinical Endocrinology & Diabetes*, *130*(S2), S151-S184. https://doi.org/10.1055/a-1624-5095
54. Śledziewska, A. M., Latocha, J. D., Dzierzgowska, W. N., Kaźmierczak, S. A., Krzyżanowska, K., Marianowska, A., & Karasiński, M. (2025). *From gut to ovary: The expanding role of GLP-1 analogues in PCOS and fertility in women. Archiv Euromedica, 15*(4). https://doi.org/10.35630/2025/15/4.017
55. Stefan, N., Yki-Järvinen, H., & Neuschwander-Tetri, B. A. (2025). Metabolic dysfunction-associated steatotic liver disease: Heterogeneous pathomechanisms and effectiveness of metabolism-based treatment. *The Lancet Diabetes & Endocrinology*, 13(2), 134–148. https://doi.org/10.1016/S2213-8587(24)00318-8

skelly SKILLS
Building Better Dietitians

References (Cont.)

56. Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2011). Long-term persistence of hormonal adaptations to weight loss. New England Journal of Medicine, 365(17), 1597–1604. https://doi.org/10.1056/NEJMoa1105816
57. U.S. Food and Drug Administration. (2024, March 8). *FDA approves first treatment to reduce risk of serious heart problems specifically in adults with obesity or overweight* [Press release]. https://www.fda.gov/news-events/press-announcements/fda-approves-first-treatment-reduce-risk-serious-heart-problems-specifically-adults-obesity-or?utm_source=chatgpt.com
58. Wharton, S., Lau, D. C. W., Vallis, M., Sharma, A. M., Biertho, L., Campbell-Scherer, D. L., ... & Bissonnette, S. (2023). Practical clinical considerations for the use of obesity pharmacotherapy. Clinical Obesity, 13(1), e12510. https://doi.org/10.1111/cob.12510
59. Wiebe, N., Ye, F., Crumley, E. T., Bello, A., Stenvinkel, P., & Tonelli, M. et al. (2021). *Temporal associations among body mass index, fasting insulin, and systemic inflammation: A systematic review and meta-analysis. JAMA Network Open, 4*(3), e211263. https://doi.org/10.1001/jamanetworkopen.2021.1263
60. (a)Wilding, J. P. H., Batterham, R. L., Calanna, S., Davies, M., Van Gaal, L. F., Lingvay, I., McGowan, B. M., Rosenstock, J., Tran, M. T. D., Wadden, T. A., Wharton, S., Yokota, S., Zeuthen, N., & Kushner, R. F. (2021). Once-weekly semaglutide in adults with overweight or obesity. New England Journal of Medicine, 384, 989–1002. https://doi.org/10.1056/NEJMoa2032183
61. (b)Wilding, J. P. H., Batterham, R. L., Calanna, S., Van Gaal, L. F., McGowan, B. M., Rosenstock, J., Tran, M. T. D., Wharton, S., Yokote, K., Zeuthen, N., & Kushner, R. F. (2021). Impact of Semaglutide on Body Composition in Adults With Overweight or Obesity: Exploratory Analysis of the STEP 1 Study. *Journal of the Endocrine Society*, *5*(Suppl 1), A16–A17. https://doi.org/10.1210/jendso/bvab048.030
62. Yanto, T. A., Vatvani, A. D., Hariyanto, T. I., & Suastika, K. (2024). Glucagon-like peptide-1 receptor agonist and new-onset diabetes in overweight/obese individuals with prediabetes: A systematic review and meta-analysis of randomized trials. *Diabetes & metabolic syndrome*, *18*(6), 103069. https://doi.org/10.1016/j.dsx.2024.103069
63. Yuan, S., & Larsson, S. C. (2023). Epidemiology of sarcopenia: Prevalence, risk factors, and consequences. *Metabolism*, *144*, 155533.

skelly SKILLS Building Better Dietitians