Obesity Management in Type 2 Diabetes

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Disclosures

NONE
Objectives

- Describe the importance of lifestyle management for obesity and glycemic control
- Evaluate pharmacotherapies and their role in treating obesity in diabetes
- Demonstrate when to recommend metabolic surgery for obese patients with type 2 diabetes
- Identify practical nutrition information for weight management and glycemic control

Outline

- The Foundation of Hyperglycemic Management
- Lifestyle
  - Medical Nutrition Therapy
  - Physical activity
- Medications
- Metabolic Surgery
**Benefits of Weight Loss**

- Delay progression from prediabetes to type 2 diabetes
- Positive impact on glycemia in type 2 diabetes
  - Most likely to occur early in disease development
- Clinically meaningful reductions in triglycerides, BP, LDL and HDL
- Reduction in need for medications to control BG, BP and lipids


**Recommendations: Assessment**

- At each patient encounter, BMI should be calculated and documented in the medical record. B
  - BMI should be:
    - Classified to determine the presence of overweight or obesity
    - Discussed with the patient
    - Documented in the patient record
  
  - Remember that BMI cut points for Asian Americans are lower than in other populations

# Overweight/Obesity Treatment Options in T2DM

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**DIET, PHYSICAL ACTIVITY & BEHAVIORAL THERAPY**
Treatment Based on Clinical Judgment

LIFESTYLE THERAPY
Evidence-based lifestyle therapy for treatment of obesity should include 3 components

<table>
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<th>PHYSICAL ACTIVITY</th>
<th>BEHAVIOR</th>
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| • Reduced-calorie healthy meal plan  
  • ~500–750 kcal daily deficit  
  • Individualize based on personal and cultural preferences  
  • Meal plans can include: Mediterranean, DASH, low-carb, low-fat, volumetric, high protein, vegetarian  
  • Meal replacements  
  • Very low-calorie diet is an option in selected patients and requires medical supervision  
  Team member or expertise: dietitian, health educator | • Voluntary aerobic physical activity progressing to >150 minutes/week performed on 3–5 separate days per week  
  • Resistance exercise: single-set repetitions involving major muscle groups, 2-3 times per week  
  • Reduce sedentary behavior  
  • Individualize program based on preferences and take into account physical limitations  
  Team member or expertise: exercise trainer, physical activity coach, physical/occupational therapist | An interventional package that includes any number of the following:  
  • Self-monitoring (food intake, exercise, weight)  
  • Goal setting  
  • Education (face-to-face meetings, group sessions, remote technologies)  
  • Problem-solving strategies  
  • Stimulus control  
  • Behavioral contracting  
  • Stress reduction  
  • Psychological evaluation, counselling, and treatment when needed  
  • Cognitive restructuring  
  • Motivational interviewing  
  • Mobilization of social support structures  
  Team member or expertise: health educator, behaviorist, clinical psychologist, psychiatrist |

Dietary Recommendations

Spectrum of Dietary Advice
Recommendations: Diet

- **Individualize** dietary recommendations!
- Address individual nutrition needs based on
  - Personal and cultural preferences
  - Health literacy and numeracy
  - Access to healthful foods
  - Willingness/ability to make behavioral changes
  - Barriers to change


Individualizing Care

- Calorie restriction is the goal
- Changes to amount of carbohydrate, fat or protein in dietary intake are equally effective and based on individual preferences and health status
- CHO has a direct effect on blood sugar and recommended intake should be individualized
- Continuous glucose monitoring is providing new information about individual glycemic response to food
- Refer to a registered dietitian
SYMPTOMS OF INSULIN RESISTANCE

Pathophysiology of insulin and insulin resistance: A good tool to create empathy

• Increased rate of fat storage (insulin is the fat storing hormone)
• Increased hunger (cravings)
• Feeling sleepy and tired (low energy level)

OUTLINE

• Which foods raise blood sugar and which foods have little effect on blood sugar?
• If I eat foods that raise blood sugar, how much can I eat?
• How do I know how many carbohydrates I am eating?
• When should I eat?
FOOD AND BLOOD SUGAR
Breads, starchy vegetables, fruits, milk, and desserts are carbohydrate foods. The will make your blood sugar go up. Eating too much at one time can make blood sugar go too high.
Count carbohydrates in grams or servings. This is the amount you need at each meal.

- Breakfast servings (____ grams)
- Lunch servings (____ grams)
- Supper servings (____ grams)
Food labels: Look at total carbohydrate, not sugar. You may subtract the fiber grams and 1/2 the amount of sugar alcohols.

Each serving is 15 grams of carbohydrate.

One Serving = 1 Slice
- 1/2 Banana
- 1 Medium
- 15-20

One Serving = 1/2 Cup
- Cheese

One Serving = 1/4 Cup

One Serving = 1 Cup

FOOD AND BLOOD SUGAR
Meats and fats will not make your blood sugar go up but may be high in calories. Choose lean meats and “good fats” and eat small to moderate portions.

Meat:
- small servings each day
- medium servings each day

One small serving:
- 1 egg
- 1-2 ounces cheese or sandwich meat
- 1/4 cup cottage cheese

One medium serving:
- 3-4 ounces
- portion the size of a deck of cards
Choose lean meats such as chicken, turkey, fish, or lean beef or pork.
Cuts from the rump or loin are lean

Fat:
- servings each day

One serving:
- 1 teaspoon

Animal fats, shortening, and trans fats are “bad fats”
Choose “good fats” that are soft or liquid at room temperature.
FOOD AND BLOOD SUGAR

These are low carbohydrate foods and will have little effect on your blood sugar. Eat as much of these foods as you would like.

Sugar Free Beverages

SWEETS

To be able to eat sweets, you will have to know how much carbohydrate they contain and count them as part of your carbohydrate allowance at that meal.

TIPS:
- Eat at least 3 meals each day
- Space meals 4-6 hours apart
- Snacks should be limited to low carbohydrate snacks
- All drinks should be diet or sugar free. If you drink fruit juice or milk, it should be counted as part of your carbohydrate at that meal

American Diabetes Association.
READING FOOD LABELS

How do I know what’s in it?

When reading food labels, it is important to read the entire label carefully. Look at the total carbohydrate on the label. This includes grams of starch, sugar and dietary fiber. The good news is that you get to subtract the grams of dietary fiber from the total carbohydrate grams to calculate your carbs.

Hot Chili with Beans

Nutrition Facts

<table>
<thead>
<tr>
<th>Serving size</th>
<th>1 cup</th>
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</thead>
<tbody>
<tr>
<td>Calories</td>
<td>230</td>
</tr>
<tr>
<td>Total Fat</td>
<td>8g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0g</td>
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<tr>
<td>Sodium</td>
<td>7mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>24g</td>
</tr>
<tr>
<td>Sugar</td>
<td>12g</td>
</tr>
<tr>
<td>Fiber</td>
<td>1g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>9g</td>
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</table>

Tip...
Consider how one portion stack-up your daily budget?

American Diabetes Association.

FOOD AND BLOOD SUGAR

Breads, starchy vegetables, fruits, milk, and desserts are carbohydrate foods. The will make your blood sugar go up. Eating too much at one time can make blood sugar go too high.

Count carbohydrates in grams or servings. This is the amount you need at each meal.

Breakfast 2-3 servings (39-55 grams)
Lunch 2-3 servings (39-55 grams)
Supper 2-3 servings (39-55 grams)

Food labels: Look at total carbohydrate, not sugar. You may subtract the fiber grams and 1/2 the amount of sugar alcohols.

Each serving is 15 grams of carbohydrates.

One Serving = 1 Slice

One Serving = 1/2 Cup

One Serving = 1 Cup

American Diabetes Association.
THE 5 MINUTE DISCUSSION ABOUT WEIGHT LOSS

• Broaching the subject: *Interactive Discussion*
• Have reasonable weight loss expectations: *Set a Goal*
• Identify behaviors that are causing weight gain: *Ask leading questions or use a weight loss questionnaire*
• Ask “what are you drinking”: *Emphasize drinking only calorie free/sugar free beverages. Drink at least 64 ounces of water daily, 8 ounces before beginning a meal*
• Eat 3 Meals and space meals 4.5 to 6 hours apart
THE 5 MINUTE DISCUSSION ABOUT WEIGHT LOSS

- Calories in vs. Calories out: *create a daily calorie deficit of at least 500 calories*
- Track calories and exercise: *use technology if available*
- Give a specific calorie goal: *use your best judgement but it is difficult to maintain below 1500 calories/day*
- Give a specific activity goal: *base on current activity level and increase in increments*

THE 5 MINUTE DISCUSSION ABOUT EXERCISE

- Everyone can do something to be more active
- Ask leading questions to find out about current activity level
- Ask questions about eating and sleeping times
- Ask questions about work schedule
### BUT DOC I CAN’T WALK TOO FAR!

<table>
<thead>
<tr>
<th>Category</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>Low-impact activity: stationary bicycle, swimming, elliptical machine, stairstepper, treadmill, low-impact aerobics, weight-lifting machine</td>
</tr>
<tr>
<td>Foot disease, peripheral vascular disease, arthritis</td>
<td>Swimming, water aerobics, upper body resistance training</td>
</tr>
<tr>
<td>Orthostatic conditions</td>
<td>Semi-recumbent chair and weight lifting, semi-recumbent cycling, water exercise</td>
</tr>
<tr>
<td>Elderly</td>
<td>Stretching while sitting, elastic bands, movement exercise (e.g., tai chi, hatha yoga)</td>
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### Apps for Tracking Food Intake and Exercise

- Fit Bit
- My Fitness Pal
- Calm
- Fooducate
Apps for Tracking Food Intake and Exercise

- Lose It
- Sparks People
- Apple Health
- Samsung Health

Diabetes Specific Technology

- Diabetes FoodHub
- My Glucose Buddy
- CGM
TOOLS FOR OFFICE USE

- American College of Physicians Weight Loss Booklet: $64/40 booklets
  https://store.acponline.org/ebizatpro/Default.aspx?TabID=251&ProductId=20627

- Weight Loss Questionnaire
- Eating Pattern Questionnaire
- BMI Chart
- Learning about Serving Sizes and Counting Calories
  file:///C:/Download%20Photo%2006%2006%202017/obesityamapthandoutwtlossmgmt.pdf
DO LIFESTYLE INTERVENTION PROGRAMS WORK?

- **DPP**: Diabetes Prevention Program by CDC
  Reduced development of diabetes by 58% compared to placebo
- **Look AHEAD**
  Loss of 6.6% in LIP vs. 2.2% in RD
- **Results**: 8-10% weight loss the first 12 weeks
Lifestyle Intervention Programs

For patients who achieve short-term weight loss goals, long-term (≥1 year) comprehensive weight maintenance programs should be prescribed.

- at least monthly contact
- encourage ongoing monitoring of body weight (weekly or more frequently) and/or other self-monitoring strategies, such as tracking intake, steps, etc.
- continued consumption of a reduced-calorie diet
- participation in high levels of physical activity (200-300 min/week).  


Lifestyle Programs

To achieve weight loss of >5%, short-term (3-month) interventions that use very-low-calorie diets (≤800 kcal/day) and total meal replacements may be prescribed

- for carefully selected patients
- by trained practitioners in medical care settings
- with close medical monitoring

• To maintain weight loss, such programs must incorporate long-term comprehensive weight maintenance counseling.  

REFERRAL OPTIONS FOR ONGOING SUPPORT

• CDC Diabetes Prevention Program
  https://nccd.cdc.gov/DDT_DPRP/Registry.aspx?STATE=ME
• Weight Watchers
  www.weightwatchers.com/us
• Weigh to Wellness
  weightowellness.com

REFERRAL OPTIONS FOR ONGOING SUPPORT

• UAB Weight Loss Medicine
  Uabmedicine.org/patient-care/treatments/weight-loss-medicine-services
• Core Life
  corelifemd.com
• Workplace Wellness Programs
Diabetes Self-Management Education

- Find a recognized Diabetes Self-Management and Support program service
- Become a recognized provider of DSME/S
- Tools and resources for DSMES
- Online education documentation tools

Professional.Diabetes.org/ERP

Websites to Recommend to Patients

https://www.choosemyplate.gov/

https://www.niddk.nih.gov/health-information/weight-management/walking-step-right-direction


https://www.nal.usda.gov/fnic/practical-healthy-weight-control

https://www.cdc.gov/healthyweight/index.html
PHARMACOTHERAPY

Overweight/Obesity Treatment Options in T2DM

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Pharmacotherapy

- Weight loss medication may be effective for selected patients with T2DM and BMI ≥27 kg/m².
- When choosing glucose-lowering meds for overweight or obese patients with T2DM, consider effect on weight. E
- Whenever possible, minimize the meds for comorbid conditions that are associated with weight gain. E
- Potential benefits must be weighed against the potential risks of the weight loss medications. A


CHOOSING DRUGS FOR OBESE PATIENTS WITH DIABETES

WEIGHT LOSS OR NUETRAL
- METFORMIN (Loss)
- GLP-1 RA (Loss)
- DPP-4 inhibitors (Neutral)
- SGLT-2 inhibitors(Slight loss)

WEIGHT GAIN
- PIOGLITIZONE
- INSULIN
- INSULIN SECRETAGOGUES

American Diabetes Association.
PHARMACOTHERAPY

• First 3 months, follow-up monthly, then every 3 months thereafter
• Effectiveness is determined by weight loss >= 5% of body weight at 3 months
• Avoid sympathomimetic agents with uncontrolled hypertension or history of heart disease

Discontinuing Medication

• If patient’s response to weight loss medications is <5% weight loss after 3 months
• If there are any safety or tolerability issues at any time
• Then, alternative medication(s) or treatment approaches should be considered. A
# FDA-Approved Medications for Treatment of Obesity

| Sympathomimetic amine anorectic/antiepileptic combination | Phentermine/lorzepam ER (109) | $223 (7.5 mg/6 mg daily) | $178 (7.5 mg/6 mg daily) | PD | 9.9 | Constipation, headache, insomnia, xerostomia, acne | • Birth defects | • Nausea, diarrhea, anxiety | • Acute angle-closure glaucoma |
|---|---|---|---|---|---|---|---|---||---|
| Opioid antagonist/antidepressant combination | Naltrexone/extended-release buprenorphine (15) | 8 mg/10 mg b.i.d. | $334 | $267 | PD | 5.0 | Constipation, nausea, headache, xerostomia, insomnia | • Contraindicated in patients with uncontrolled hypertension and/or seizure disorders | • Contraindicated for use with chronic opioid therapy | • Acute angle-closure glaucoma | • Black box warning: • Risk of suicidal behavior/ideation |
| Glucagon-like peptide 1 receptor agonist | Liraglutide (16) | 3 mg q.d. | $1,441 | $1,154 | PD | 5.0 | Hypoglycemia, constipation, nausea, headache, injection | • Acute pancreatitis | • Black box warning: • Risk of thyroid C-cell tumors | • Contraindicated with personal or family history of MTC or MEN 2 |

All medications are contraindicated in women who are or may become pregnant. Women of reproductive potential must be counseled regarding the use of reliable methods of contraception. Select safety and side effect information is provided; for a comprehensive discussion of safety considerations, please refer to the prescribing information for each agent. b.i.d., twice daily; ER, extended release; MTC, medullary thyroid carcinoma; OTIC, over the counter; PD, placebo; q.d., daily; Rx, prescription; t.i.d., three times daily; XR, extended release.

*Use lowest effective dose; maximum appropriate dose is 37.5 mg. **Duration of treatment was 28 weeks in a general obese adult population. **Enrolled participants had normal (77%) or impaired (21%) glucose tolerance. *** Maximum dose, depending on response, is 35 mg/92 mg q.d. [Approximately 68% of enrolled participants had type 2 diabetes or impaired glucose tolerance.](http://www.diabetes.org/)

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### Summary

- **Lifestyle is the foundation***
  - Highly effective in motivated, adherent patients

- **Medications**
  - Lots of choices
  - We hope to make it easier to navigate them
  - Safety, efficacy, cost and convenience

- **Metabolic surgery***
  - Consider it as very effective salvage therapy

*The only choices that can lead to disease remission
Medical Devices for Weight Loss

- Several minimally invasive medical devices have been recently approved by the FDA for short-term weight loss.
- It remains to be seen how these are used for obesity treatment.
- Given high cost, extremely limited insurance coverage, and paucity of data in people with diabetes at this time, these are not considered to be the standard of care for obesity management in people with type 2 diabetes at this time.

Sullivan S. Diabetes Spectr 2017;30:258–264

Metabolic Surgery

- Evidence supports gastrointestinal (GI) surgery as effective treatments for overweight T2DM patients.
- Randomized controlled trials with postoperative follow-up ranging from 1 to 5 years have documented sustained diabetes remission in 30–63% of patients, though erosion of remission occurs in 35-50% or more.

• With or without diabetes relapse, the majority of patients who undergo surgery maintain substantial improvement of glycemic control for at least 5 to 15 years with a median of 8.3 years with Roux-en-Y gastric bypass.

• People who undergo metabolic surgery should be evaluated to assess the need for ongoing mental health services to help them adjust to medical and psychosocial changes after surgery. C


• Should be recommended as option to treat T2DM in appropriate surgical candidates with BMI \( \geq 40 \) kg/m\(^2\) (37.5*), and in adults with BMIs 35.0-39.9 kg/m\(^2\) (32.5-37.4*) who do not achieve durable weight loss and improvement in co-morbidities (including hyperglycemia) with reasonable nonsurgical methods. A

• May be considered as option for adults with T2DM and BMI 30-34.9 kg/m\(^2\) (27.5-32.4*) who do not achieve durable weight loss and improvement in co-morbidities (including hyperglycemia) with reasonable nonsurgical methods. A

Metabolic Surgery

- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams that understand and are experienced in the management of diabetes and gastrointestinal surgery. C

- Long-term lifestyle support and routine monitoring of micronutrient and nutritional status must be provided after surgery, according to guidelines for postoperative management of metabolic surgery by national and international professional societies. C

- People presenting for metabolic surgery should receive a comprehensive readiness and mental health assessment. B
Metabolic Surgery

• People who undergo metabolic surgery should be evaluated to assess the need for ongoing mental health services to help them adjust to medical and psychosocial changes after surgery. C

• Surgery should be postponed in patients with alcohol or substance abuse disorders, significant depression, suicidal ideation, or other mental health conditions until these conditions have been fully addressed.

Metabolic Surgery—Adverse Effects

• Mortality rates typically 0.1%-0.5%, similar to cholecystectomy or hysterectomy

• Morbidity has dramatically declined with laparoscopic approaches

• Major complication rates compare favorably to other elective operations (i.e., deep venous thrombosis)

• Long term- dumping syndrome, vitamin and mineral deficiencies, anemia, osteoporosis, hypoglycemia
Metabolic Surgery: Adverse Effects

- Costly, but may be cost-effective long term
- Patients undergoing metabolic surgery may be at higher risk for depression, substance abuse, and other psychosocial issues

DATA FROM SWC WEIGHT LOSS PROGRAM

- Started 2 years ago
- 140 patients
- Small group setting of 5-10
- Referred by PCP
- Attrition rate of about 50% from referral to attendance
- Self pay: $40 for the first class and $20 each for the two follow-up classes
Goal is to offer several ways to lose weight
• Mindful eating
• Changing behaviors
• Creating a daily calorie deficit
• Portion control
• Lower carb diet for those with metabolic syndrome
• Menu planning
• Using apps to track food intake and activity

Data from the last year only
• 16/67 participants achieved weight loss of 5% or greater. 6 lost 10%- 12.7% of their body weight
• 9/16 were taking weight loss medication (1 phentermine and 5 GLP-1 RA)
• 2 lost weight due to diagnosis of breast cancer
• 4 lost weight due to lifestyle modification
• 1 participant had bariatric surgery
LESSONS LEARNED

• Everyone says they want to lose weight but follow through and commitment are lacking
• PCP may need to make sure appointments are patient driven
• Readiness to change should be assessed
• Ongoing support and follow up are needed
• Considering patient focused support groups

IT’S COMPLICATED

• Address concerns with empathy
• Discuss BMI
• Offer resources
• Offer ongoing support/lifestyle intervention programs
• Consider BMI when choosing diabetes meds
• Intervene earlier with Pharmacotherapy
• Metabolic surgery is a good option and the only option for some
Thank You!