Obesity Management in Type 2 Diabetes

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Disclosures

Within the past 12 months, Donna Ryan discloses the following financial relationships with the following companies:

Alpha Sights, Amgen, Epitomee, Gila Therapeutics, IFA Celtic, Janssen, KVK Tech, Novo Nordisk, Phenomix, Quintiles, real appeal (United Health), Sanofi, and Scientific Intake, Xeno Bioscience
Objectives

• Describe the importance of lifestyle management for diabetes mellitus control
• Identify how pharmacotherapies effect patient weight
• Demonstrate when to recommend metabolic surgery for patients with type 2 diabetes

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

<table>
<thead>
<tr>
<th>Body Mass Index (BMI) Category (kg/m²)</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diet, physical activity &amp; behavioral therapy</td>
</tr>
<tr>
<td>25.0-26.9 (or 23.0-26.9*)</td>
<td>X</td>
</tr>
<tr>
<td>27.0-29.9</td>
<td>X</td>
</tr>
<tr>
<td>30.0-34.9 (or 27.5-32.4*)</td>
<td>X</td>
</tr>
<tr>
<td>35.0-39.9 (or 32.5-37.4*)</td>
<td>X</td>
</tr>
<tr>
<td>≥40 (or ≥37.5*)</td>
<td>X</td>
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<tr>
<td></td>
<td>Pharmacotherapy</td>
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<td></td>
<td>Metabolic surgery</td>
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</tbody>
</table>

* Cutoff points for Asian-American individuals.

X Treatment may be indicated for selected, motivated patients.

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**DIET, PHYSICAL ACTIVITY & BEHAVIORAL THERAPY**
Diet, Physical Activity, Behavioral Therapy Interventions:

• Designed to achieve and maintain >5% weight loss should be prescribed for overweight and obese patients ready to achieve weight loss. A

• High-intensity (≥16 sessions in 6 months) and designed to achieve a 500 - 750 kcal/day energy deficit. A

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
• Refer to a registered dietitian

Encouragement: Quick Tips

• Stress the value of losing a small amount of weight
• Assess patient’s current eating patterns and physical activity
• Find out what patient thinks needs to change in order to lose weight
• Eat less, move more
• Plan ahead: parties, traveling, other activities outside normal routine
• Ask “Are there swaps you can make to reduce calories?”
  – Popcorn instead of potato chips
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). A


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. B

PHARMACOTHERAPY

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

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

Table 8.3–Medications approved by the FDA for the treatment of obesity

<table>
<thead>
<tr>
<th>Medication name</th>
<th>Typical adult maintenance dose</th>
<th>Average wholesale price (30-day supply)</th>
<th>National Average Drug Acquisition Cost (30-day supply)</th>
<th>Treatment arm</th>
<th>Weight loss (% loss from baseline)</th>
<th>Common side effects</th>
<th>Possible safety concerns/considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term treatment (≤12 weeks)</td>
<td>Phenetermine (TSR) 8-50.5 mg q.d.* 37.5 mg dose</td>
<td>$5.56 (37.5 mg dose)</td>
<td>$4 (37.5 mg dose)</td>
<td>15 mg q.d.</td>
<td>5.1</td>
<td>3.3</td>
<td>Dry mouth, insomnia, dizziness, irritability</td>
</tr>
<tr>
<td>Long-term treatment (&gt;12 weeks)</td>
<td>Orlistat (Z) 60 mg t.i.d.</td>
<td>$140-582</td>
<td>$748</td>
<td>$4</td>
<td>35</td>
<td>130 mg t.i.d.</td>
<td>9.6</td>
</tr>
<tr>
<td>Selective serotonin (5-HT) 2C receptor antagonist</td>
<td>Lorcaserin (14) 10 mg b.i.d.</td>
<td>$338</td>
<td>$40</td>
<td>$255</td>
<td>10 mg b.i.d.</td>
<td>4.5</td>
<td>Headache, nausea, dizziness, fatigue, nasopharyngitis</td>
</tr>
</tbody>
</table>

*TSR: 30 mg strength does not exist.
| Sympathomimetic amine anorectic/antiepileptic combination | Phentermine/ Topiramate ER (159) | 7.5 mg/46 mg q.d. | $223 (7.5 mg/ 46 mg dose) | $178 (7.5 mg/ 46 mg dose) | 15 mg/92 mg q.d. | 7.5 mg/50 mg q.d. | 9.8 | 7.8 | Constipation, paresthesia, insomnia, nasopharyngitis, xerostomia | • Birth defects • Cognitive impairment • Acute angle-closure glaucoma |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Opioid antagonist/antidepressant combination | Naltrexone/ Bupropion ER (15) | 8 mg/10 mg, 2 tablets b.i.d. | $334 | $267 | 16 mg/ 180 mg b.i.d. | 5.0 | 1.8 | Constipation, nausea, headache, 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 | 3.0 mg q.d. | 0.0 | 4.7 | Hypoglycemia, constipation, nausea, headache, linduration | • Acute pancreatitis • Black box warning: • Risk of thyroid C-cell tumors • Contraindicated with personal or family history of MTC or MEN2 |

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; MEN2, multiple endocrine neoplasia syndrome type 2; MTC, medullary thyroid carcinoma; OTC, over the counter; PBO, 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. Unenrolled participants had normal (7%) or impaired (21%) glucose tolerance. Maximum dose, depending on response, is 15 mg/92 mg q.d. [approximately 68% of enrolled participants had type 2 diabetes or impaired glucose tolerance.}

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.


Metabolic Surgery

• 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.

Metabolic Surgery

- **Should be recommended** as option to treat T2DM in appropriate surgical candidates with BMI ≥40 kg/m² (37.5*), and in adults with BMIs 35.0-39.9 kg/m² (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/m² (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

Metabolic Surgery

• 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
Putting into Practice

Check your patients lifestyle perceptions
Example: Skipping meals can help you lose weight faster
True or False

False: Skipping meals makes your body less efficient and is likely to cause increased hunger and result in poor food choices.

Pop Quiz

When addressing nutritional needs for an overweight or obese patient with diabetes:

A. Consider cultural and personal preferences
B. Put the patient on a low carb diet
C. Prescribe the Official ADA diet
D. Focus solely on total fat consumption
Case Challenge

• Mr. Boudreau is a 56 year old commercial fisherman. You are caring for his multiple medical problems (type 2 diabetes mellitus, hypertension, obstructive sleep apnea (OSA), osteoarthritis of the knees, and obesity.
• Today he asks, “What can I do about my weight? I know that most of my health problems are due my weight.”
• Medications
  – Metformin ER 500 mg BID
  – Glyburide 10 mg BID
  – Losartan 100 mg QD
  – Diltiazem 240 mg QD
  – Atorvastatin 10 mg QD
  – Aspirin 81 mg QD
  – Chlorthalidone 25 mg QD
  – Nightly CPAP

Mr. Boudreau

• married for 20 years and has 2 children.
• Weight history. 190 pounds when finished high school (played football). Says “I have battled weight my whole life. I’ve lost in the past, sometimes on diet, once on diet medications. I saw a nutritionist when I was diagnosed with diabetes.”
• He says, “My weight is my own fault, but it’s hard to eat healthy with my job; it takes too much time and I don’t have it. I love food and my social life revolves around it. I eat out for entertainment. I go to crawfish boils and love the sports bar. This is my reward for my hard job. My physical activity is my job.”
Mr. Boudreau

- **Physical examination**
  - Weight: 278 lbs; height: 70”
  - BMI: 40 kg/m²
  - BP: 128/62 mm Hg
  - HR: 92 bpm
  - Extremities: 1+ edema

- **Labs**
  - FBS: 100 mg/dL
  - A1C: 6.8%
  - BUN: 18 mg/dL
  - eGFR: 73 mL/min/1.73 m²

- **Lipids**
  - TC: 154 mg/dL
  - LDL-C: 80 mg/dL
  - TG: 181 mg/dL
  - HDL-C: 38 mg/dL

During the exam, Mr. Boudreau asks you, “What do you think about bariatric surgery? My neighbor had it and he is off his diabetes meds.”

What is your response to his question about bariatric surgery?

1. Go for it; here is the name of a good surgeon.
2. Before you make this decision, you need to find out more about it. Go to a seminar at the hospital.
3. Let’s talk about all of your options. You have struggled, but you have never tried medically supervised weight loss or one of the new medications.
4. You have a number of chronic diseases. Your focus should first be on your diabetes. If you control glycemia, you can prevent future complications.
Mr. Boudreau

• You discuss all options with the patient.
• He attends a group discussion of bariatric surgery but says, “I want to try something less aggressive.”
• He agrees to work with a registered dietitian who helps him design a meal plan he can live with and which incorporates his favorite foods with portion control.
• He also agrees to discuss possible medications to aid in his dieting efforts.

Mr. Boudreau

• Through shared decision making, the patient elects to try liraglutide 3.0 mg, and you provide a prescription. He is instructed on use of a pen and drug administration, including titration over the first month.
• Over the next 6 months, he loses 22 lbs (8% of initial body weight). Weight is now 256 lbs. New BMI = 36.8 kg/m² (class II obesity). BP 105/65 mm Hg
• Labs
  – Glucose: 85 mg/dL
  – A1C: 5.8%
  – TC: 174 mg/dL
  – LDL-C: 104 mg/dL
  – HDL-C: 51 mg/dL
  – TG: 95 mg/dL
• Weight and labs remain stable over an additional 6 months.
Pop Quiz

Mr. Boudreau returns for a follow-up visit at 1 year. What do you recommend at this time?

1. The medical problems are well controlled. No changes needed.
2. Begin to taper and discontinue some of the medications to simplify his regimen.
3. Broach the topic of bariatric surgery again for further weight loss and resolution of medical problems.
4. Try to get more weight loss by a new diet or adding an additional medication for further weight loss.
5. Discussion of options 1, 2, 3 with the patient.

Helpful Resources
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

ADA Nutrition Tool

- Digital and recipe destination
- Innovative meal planning
- Shopping list tools
- Expert cooking tips and tricks

DiabetesFoodHub.org
Thank You!