CARE PATH GUIDE

Obesity

Vanderbilt Health
Affiliated Network

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I. INTRODUCTION

CLINICAL JUDGMENT

The care path is intended to be broadly applicable, but it is not meant to substitute for clinical judgment. Clinicians and specialists should tailor processes and approaches to align with patient needs, abilities and care goals. This care path guide is based on the most recent available recommendations from the Academy of Nutrition and Dietetics, the American Society of Bariatric and Metabolic Surgery, the Endocrine Society and the Obesity Society.

OBESITY: A BURDEN ON PUBLIC AND PERSONAL HEALTH

Nationally, more than 40% of the United States adult population is affected by obesity, a chronic progressive disease[1] linked to many medical conditions, including diabetes, heart disease and certain types of cancer.[1] Etiology is multifactorial, including environmental, metabolic, genetic and socioeconomic factors.[2,3] The Centers for Disease Control and Prevention (CDC) estimates the medical care costs of obesity at $147 billion per year.[1] Obesity costs add up incrementally over time and not only affect insurance costs, but also have an impact on lifetime productivity losses.[4] At a personal level, individuals suffering from obesity have an inferior quality of life in terms of physical health, emotional well-being and psychosocial functioning.[5]

Obesity is associated with more than 40 diseases, including type 2 diabetes and its sequelae, heart disease, stroke, and numerous cancers.[2,6,7] Proper management of obesity, whether surgically or nonsurgically, can delay, ameliorate or prevent these complications.

THE CASE FOR A CARE PATH GUIDE

Recent studies have demonstrated that inadequate, unnecessary and inefficient care are responsible for waste in the healthcare system that may account for 35%–50%[8] of the more than $3 trillion the United States spends annually on healthcare.[9] With a central goal of reducing unnecessary variability, care path guides can be tools for education, reporting, measurement and continuous improvement. They are designed to standardize care and assure a consistent level of quality for patients across time, venue and provider, combining workflow-friendly, evidence-based practice principles.

THE CHALLENGE OF OBESITY MANAGEMENT

TABLE 1: DEFINING OBESITY: CLASSIFICATION OF OVERWEIGHT AND OBESITY BY BODY MASS INDEX (BMI), OBESITY CLASS AND ASSOCIATED DISEASE RISK[10]

	BMI (kg/m^2)	Obesity Class	Obesity Disease Risk* (Relative to normal weight and waist circumference)
Underweight	<18.5		-
Normal	18.5–24.9		-
Overweight	25.0–29.9		Increased
Obesity	30.0–34.9	I	High
	35.0–39.9	II	Very high
Extreme Obesity	≥40	III	Extremely high

* Disease risk for type 2 diabetes, hypertension and cardiovascular disease

Obesity has been identified as a metabolic and hormonal disease state[11] leading to impaired function, including appetite dysregulation, abnormal energy balance, endocrine dysfunction, and systemic and adipose tissue inflammation. While healthcare providers cannot ameliorate all factors that lead to obesity, they can help manage hormonal and metabolic abnormalities that lead to obesity-related comorbidities. Obesity is a chronic disease that requires lifetime monitoring and may encompass multiple therapies to achieve the desired outcome. Often, therapies are divided into two approaches: medical weight management or weight loss surgery. However, both tools should be considered throughout the disease process and can often be synergistic when used together.

This guide focuses on the management of adults with obesity; pediatric weight loss is outside its scope.

HEALTH STATUS MEASURES AND PATIENT-REPORTED OUTCOMES

Health status measures in general and patient-reported outcome measures (PROMs) in particular are becoming important standard components of patient care. These measures are validated tools that provide insight into patient-relevant issues, improve patient/clinician communication and guide individual management. They provide a method to objectify outcomes and quality in a manner that can be shared with patients.

These measures require patient participation and have been shown to improve patient engagement in their own healthcare. They are an important component of value-based care and are becoming significant factors in health policy and reimbursement, as well.

Sidebar 1

PROMS FOR WEIGHT MANAGEMENT (GENERAL)

In weight management, the following PROMs are particularly relevant in helping clinicians evaluate general and behavioral health status that could affect outcomes and guide treatment:

- Patient-Reported Outcomes Measurement Information System (PROMIS)
- Global-10: A 10-question screening tool designed to assess physical, mental and social health, including pain, fatigue and quality of life.
- PHQ-2: A two-question depression screening tool that can provide information about the patient's mental health status. If the patient has a positive PHQ-2 score of three or higher, they should be further screened for depression. [12,13]
- IWQOL: A questionnaire developed to assess the effects of obesity on health-related quality of life.[14]

PROMS FOR WEIGHT MANAGEMENT (IMMEDIATE PRE- AND POST-SURGICAL ONLY)

- WHODAS 2.0: An assessment tool administered as either a 12-item self-report or a more detailed 36-item structured interview used to measure disability and functional impairment in psychiatric disorders.[15]
- QoR-15: A 15-question patient-reported outcome tool measuring quality of recovery after surgery and anesthesia.[16]

II. MEDICAL WEIGHT MANAGEMENT

GOAL OF MEDICAL WEIGHT MANAGEMENT

People with a BMI greater than 27kg/m² who have a weight-related comorbidity or people who have a BMI greater than 30kg/m² with or without a weight-related comorbidity should be considered for formal weight loss efforts. The primary goal of medical weight management of obesity is achieving a weight reduction of 7%–10%. Secondary goals include improving metabolic outcomes, reducing no-show rates, achieving satisfaction, and limiting or eliminating disease comorbidities. Even a modest, sustained weight loss of 3%–5% can improve clinical outcomes (e.g., reduction in triglycerides, blood glucose and type 2 diabetes risk).[17] When a larger volume of weight is lost, there are further reductions in risk factors of cardiovascular disease (CVD) (e.g., low-density and high-density lipoprotein cholesterol and blood pressure) and the need for medication to control previously diagnosed CVD and type 2 diabetes.[17] Therefore, a weight loss goal of 5%–10% of total body weight within six months of management is recommended.[17]

TRIAGE AND ASSESSMENT

Primary Care Initial Screening and Diagnosis (see Algorithm 1)

All adults should be screened annually for obesity using a BMI measurement. Other methods (e.g., bioelectric impedance, air/water displacement plethysmography) to determine adiposity may be used at the clinician's discretion if BMI results are equivocal or require further evaluation.[18] Screening and diagnosis typically occur through primary care providers, who can offer basic weight management treatment options (see tables 2 and 3 for details). It is recommended that the primary care provider offer education sources and tools (see section V) to the patient. Based on obesity status and risk factors, the provider and patient should engage in joint decision-making for medical or surgical management.

- *New patient obesity bloodwork.* At minimum, glucose, lipid and endocrine profiles are recommended for every weight-management-program patient.[17] If basic labs are available within the last 12 months, bloodwork is at the discretion of the provider.
- Consultation with a registered dietitian should be also be completed on this visit if possible.

ALGORITHM 1: MEDICAL/SURGICAL MANAGEMENT DECISION TREE

Overall Goal: To deliver high-quality intensive weight management to a complex cohort of patients with the goal of enabling sustained weight loss while also improving patient outcomes, relieving disease comorbidities and enhancing patient satisfaction.

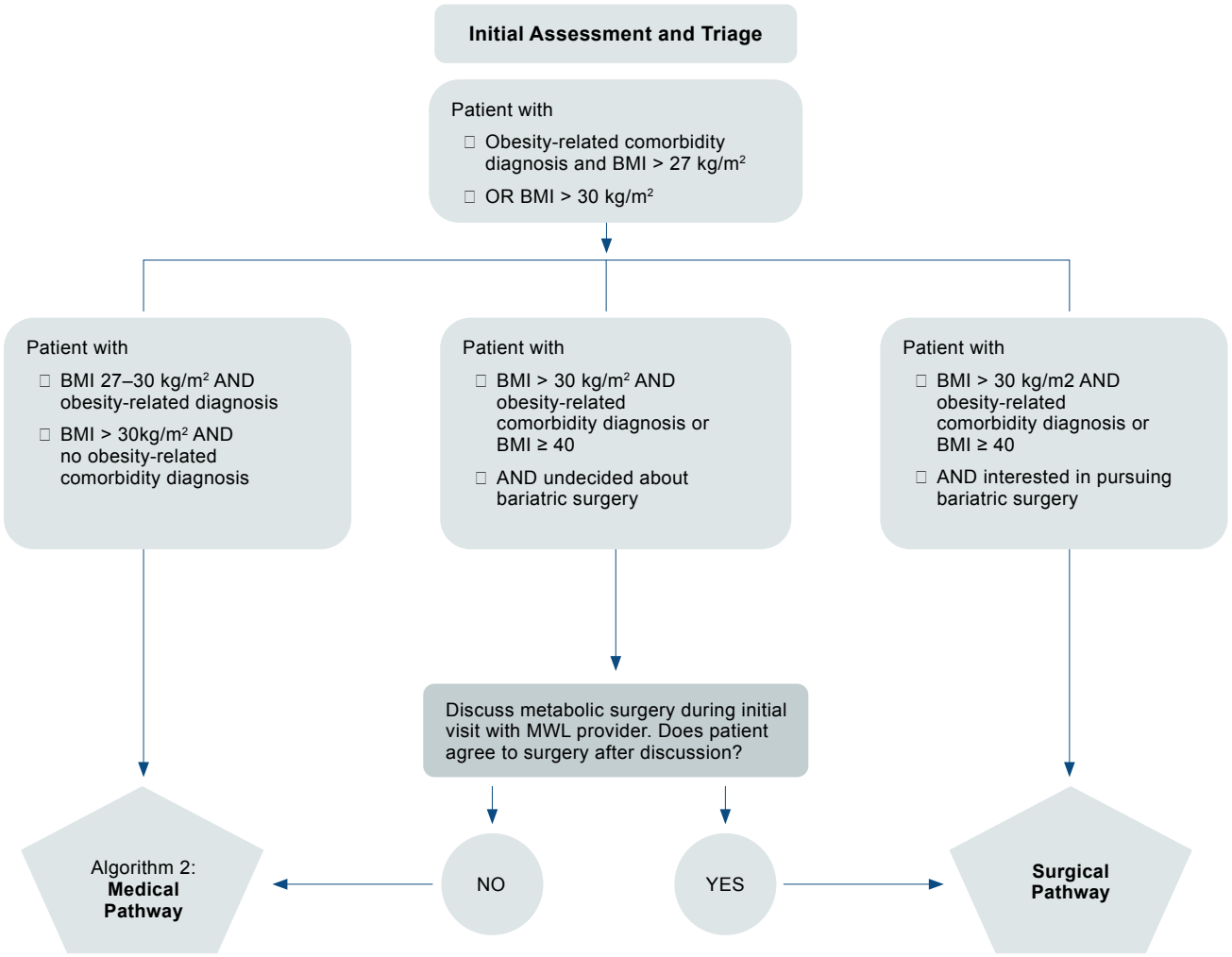


TABLE 2: ELEMENTS OF A MEDICAL WEIGHT MANAGEMENT PLAN

Element	Objectives	Methods
Nutrition Therapy	Weight loss, reduction of comorbidities, helping diabetic patients meet glycemic and other goals	Meal planning, micronutrient tracking, focus on achievable weight loss. Portion size modeling, intake and macronutrient monitoring, and research-proven diets, such as the DASH and Mediterranean eating plans, can be used as tools.
Exercise	Assistance with weight loss, reduced stress, improved quality of life	Group exercise classes can help with motivation and decrease stigma. Individual consultation with an exercise physiologist can help patients devise exercise plans that are safe, feasible and rewarding.
Behavior Modification	Motivation to change, behavioral efficacy and self-management, problem-solving skills	Nutritional, cognitive nutritional, and other group classes provide social support, empathy and role modeling. One-on-one sessions allow for individual instruction and support.
Medications	Weight loss when diet and exercise alone have proven ineffective	We recommend prompt initiation of medication therapy as an adjunct to dietary and behavioral modification.
Sleep Hygiene	Promoting good sleep habits, assisting with increasing sleep quality and duration	Initiating continuous positive airway pressure (CPAP) treatment if indicated, counseling on controlling sleep environment by avoiding stimulants and certain foods before bedtime, limiting daytime naps and bright lights (TV, cellphone, computer, etc.) before bedtime.
Circadian Rhythm Disturbances	Identify potential circadian rhythm disturbances that may impede weight loss	Behavioral treatment therapy to help adjust sleep time in accordance with the body's natural circadian rhythm.
Stress Management	Managing stress to control stress-triggered or emotional eating as a preventive measure to weight gain; recognizing signs of stress: anxiety, irritability, muscle tension	Nutritional, cognitive nutritional and other group classes provide social support, empathy and role modeling. One-on-one counseling sessions allow for individual instruction and support. Group exercise classes can help with stress management.

PROMPT INITIATION OF ANTI-OBESITY MEDICATIONS

Vanderbilt Health Affiliated Network recommends prompt initiation of anti-obesity medications per *The Journal of Clinical Endocrinology & Metabolism* guidelines for all patients with a BMI of greater than 27 kg/m² with comorbidity or BMI greater than 30 kg/m². Medications are to be used as adjuncts to behavioral modification and reducing food intake.[19] Weight loss medications can improve adherence to behavioral changes and may improve physical function so that physical activity is easier in those who cannot initially exercise due to their weight.[19]

Patients who have been unsuccessful in the past with weight loss and those who meet label indications are candidates for weight loss medication.[19]

TABLE 3: ANTI-OBESITY MEDICATIONS[19]

Class/MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
NE-releasing agent (phentermine) GABA receptor modulation (topiramate)	Phentermine/ Topiramate ER **QSYMIA**	Starting dose: 3.75/23 mg daily x 14 days Recommended dose: 7.5/46 mg daily Maximum dose: 15/92 mg/day	6%–8.7%	$$$	• Cognitive impairment • Constipation • Dizziness • Dry mouth • Dysgeusia • Headache • Hypokalemia • Insomnia • Paresthesia • Tachycardia • Teratogenicity	Robust weight loss Long-term use	Controlled substance (IV) *Teratogenic *Cost Contraindications: Cardiovascular disease, glaucoma, hyperthyroidism, history of drug abuse, MAOI use within 14 days, ongoing alcohol use, pregnancy and breastfeeding Monitor: Blood pressure, heart rate, renal function, electrolytes, changes in mood/SI, pregnancy tests Counsel: Avoid abrupt withdrawal due to potential for seizures
Sympatho-mimetic	Phentermine **ADIPEX-P** (37.5 mg) **LOMAIRA** (8mg - IR)	Adipex: 15 mg–37.5 mg once daily Can start with a quarter or a half of a 37.5 mg tablet once daily and titrate upwards to a maximum of 37.5 mg Lomaira: 8 mg 2–3 times daily	5%	$	• Anxiety • Constipation • Dizziness • Dry mouth • Headache • Hypertension • Insomnia • Irritability • Tachycardia	Inexpensive Oldest on the market (1959)	Controlled substance (IV) *Long-term use not approved *Side-effect profile Contraindications: Agitated states, anxiety disorders, arrhythmias, ASCVD, HF, uncontrolled HTN, CVA, seizure disorder, history of drug abuse, glaucoma, hyperthyroidism, use of MAOI within 14 days, pregnancy and breastfeeding Monitor: Blood pressure, heart rate, blood glucose in patients with DM, CNS overstimulation Counsel: Abuse potential, keep in a safe place to prevent theft

Class/MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Glucagon-like peptide-1 receptor agonist (GLP-1 RA)	Liraglutide **SAXENDA**	Initial dose: 0.6 mg SC once daily Weekly titrations: Increase dose by 0.6 mg each week as tolerated Titration Schedule: • Week 1, 0.6 mg SC daily • Week 2, 1.2 mg SC daily • Week 3, 1.8 mg SC daily • Week 4, 2.4 mg SC daily • Week 5, 3 mg SC daily **If patient does not tolerate a dose escalation, consider delaying next dose escalation for 1 week or until symptoms resolve.	6%–6.2%	$$$$	• Abdominal pain • Constipation • Diarrhea • Dizziness • Dyspepsia • Headache • Hypoglycemia • Loss of appetite • Nausea • Vomiting	Side-effect profile Long-term data ASCVD benefits	Injectable formulation *Cost Contraindications: Personal or family history of medullary thyroid cancer or MEN2, pancreatitis, acute gallbladder disease, pregnancy and breastfeeding Monitor: Signs or symptoms of acute cholelithiasis or pancreatitis, signs of dehydration and renal function if severe GI SEs are present, blood glucose in DM, injection site reactions, suicidal ideation Counsel: Pen and injection education and training required

Class/MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Opioid antagonist (naltrexone) Aminoketone antidepressant (bupropion)	Bupropion ER/ Naltrexone ER **CONTRAVE**	Initial dose: 8mg/90mg once daily Weekly titrations: Increase dose by 1 tablet (8/90mg) weekly x 4 weeks Titration schedule: • Week 1, 1 tab AM, 0 tab PM • Week 2, 1 tab AM, 1 tab PM • Week 3, 2 tabs AM, 1 tab PM • Week 4, 2 tabs AM, 2 tabs PM	2%–5.2%	$$	• Anxiety • Constipation • Diarrhea • Dizziness • Dry mouth • Headache • Insomnia • Nausea • Tremor • Vomiting	Tx food addiction Long-term data	Side effect profile *Extensive DDIs Contraindications: Uncontrolled HTN, seizure disorder, anorexia, bulimia, chronic opioid use, use of additional bupropion-containing products, MAOI within 14 days, undergoing abrupt discontinuation of alcohol, BZDs, barbiturates, and anti-epileptic drugs, pregnancy and breastfeeding DDIs: MAOIs, digoxin, amantadine, levodopa, drugs metabolized by CYP2D6 (SSRIs, TCAs, antipsychotics, beta-blockers, class 1C antiarrhythmics), CYP2B6 inhibitors or inducers Monitor: Worsening depression, suicidal behavior or ideation, worsening migraines, blood pressure, heart rate, liver function, blood glucose, vision changes Counsel: Do NOT take with high-fat meal—increases seizure risk.
Lipase inhibitor—decreases fat absorption by approximately 30%	Orlistat **XENICAL** (120 mg) **ALLI** (60 mg - OTC)	–120 mg TID (within one hour of meal)	4%–6%	$$	• Fecal urgency • Fecal incontinence • Fatty/oily stool • Flatus with discharge • Headache • Increased defecation • Malabsorption of fat-soluble vitamins (A,D,E and K) • Oily spotting • Upper respiratory infection	Inexpensive Non-systemic/ can be used for patients who are not candidates for centrally acting agents	Side effects limit use. *Less weight loss compared with other medication therapies. Contraindications: Cholestasis Malabsorption syndromes Pregnancy and breastfeeding Drug interactions: Decreases absorption of amiodarone, anti-epileptics, antivirals, cyclosporine and levothyroxine. Enhances the effects of warfarin. Counsel: Limit total calories from fat to 30%. Take MVI supplement HS.

TABLE 4: DIABETES AND OTHER MEDICATIONS AVAILABLE FOR OFF-LABEL USE

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Anticonvulsant	Zonisamide **ZONEGRAN**	Initial dose: Week 1–2: 100 mg daily Titration: Week 3–4: 200 mg daily Week 5–6: 300 mg daily Week 7: 400 mg daily Maintenance dose: 400 mg daily Max dose: 600 mg once daily *200 mg/day dose did not result in weight loss that reached statistical significance	6–9.4%	$$–$$$	• Abdominal pain • Agitation • Ataxia • Confusion • Depression • Diarrhea • Dizziness • Fatigue • Headache • Irritability • Kidney stone • Loss of appetite • Memory impairment • Nausea • Speech disturbance • Somnolence • Unable to concentrate • Word-finding difficulties	May consider in patients who struggle with binge eating	Not recommended in geriatric population, especially if there is a history of falls or fractures. Contraindications: Hypersensitivity to sulfonamides Monitor: • Ammonia levels • Bicarbonate levels (risk of metabolic acidosis) • Kidney function • Liver function • Rash—may cause SJS • Worsening of psychiatric symptoms, including depression and psychosis Counsel: • Drink 6–8 glasses of water per day to reduce risk of kidney stones • Take capsule whole • Do not abruptly discontinue—requires gradual taper • Use caution in hot environments—may cause oligohydrosis and heat stroke

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Antidepressant Norepinephrine-Dopamine reuptake inhibitor (NDRI) and nicotine receptor antagonist	Bupropion (IR, SR, XL) **WELLBUTRIN**	Initial dose: 150 mg daily x 3 days Maintenance dose: 150 mg BID (300 mg/day) Max dose: 200 mg BID (400 mg/day)	4.6–10.1%	$–$$ (IR<XL)	• Abdominal pain • Agitation • Anxiety • Constipation • Depression • Diarrhea • Diplopia • Dizziness • Dry mouth • Headache • Infection • Insomnia • Nausea • Palpitations • Sweating • Tinnitus	Inexpensive Could consider in patients with concomitant depression	Gradual escalation in dosage is important to minimize initial SEs. If necessary, these effects may be managed by temporary reduction of dose. Consider factors that increase risk of seizure, including: • Excessive alcohol intake (or abrupt cessation) • Prior head trauma or seizure • CNS tumor, severe hepatic cirrhosis, and concomitant medications that lower seizure threshold (antipsychotics, anti-depressants, stimulants, systemic steroids) Contraindications: • Anorexia (current or prior) • Bulimia (current or prior) • Seizure disorder • MAOI inhibitors (requires 14-day washout period) Monitor: • Blood pressure • Clinical worsening of psychiatric disease • Depression • Suicidality • Unusual changes in behavior Counsel: • Insomnia may be minimized by avoiding bedtime doses. • GI SEs are expected and improve over time, abstinence from alcohol is encouraged.

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Biguanide	Metformin (IR, XR, ER) **GLUCOPHAGE**	Initial dose: 500 mg/day Titration: Increase by 500 mg every 1–2 weeks, as tolerated Goal dose: IR: 1000 mg BID XR: 2000 mg daily	4.1–6.9%	$–$$ (IR<XR)	• Abdominal discomfort • Diarrhea • Flatulence • Headache • Indigestion • Nausea • Vomiting	• Inexpensive • BG reduction • Can use in pregnancy	Starting with a low dose and using planned titrations reduces incidence of GI SEs. Use extended release formulation if unable to tolerate IR. Contraindications: • eGFR < 30 mL/min • Hepatic impairment • Metabolic acidosis (acute or chronic) Monitor: • Blood sugar • Renal function, • Vitamin B-12 levels Counsel: • Avoid excessive alcohol intake. • Do not crush or chew extended release tabs. • Hold prior to procedures requiring iodinated contrast.

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
GABA receptor modulation	Topiramate (IR, ER) **TOPAMAX**	Initial dose: Week 1: 15mg or 25 mg daily Titration: Week 2: 15mg or 25 mg BID Week 3: 30mg or 50 mg BID Week 4: 45mg or 75 mg BID Week 5: 60mg or 100 mg BID Week 6: 75mg or 100 mg BID Week 7: 90mg or 100 mg BID Studied maintenance doses: 64 mg, 96 mg or 192 mg per day in 2 divided doses Max recommended dose: 192 mg/day. *No additional weight loss when titrating to 384 mg/day	3.9–7.3%	$–$$$ (IR<ER)	• Anorexia • Anxiety • Confusion • Depression • Diplopia • Difficulty with concentration/ attention • Dizziness • Drowsiness • Fatigue • Memory impairment • Paresthesia • Speech or language problems • Vision abnormalities	May help reduce emotional eating. BP reduction secondary to weight loss noted in studies.	Starting with a low dose and using planned titrations reduces the incidence of related cognitive dysfunction. Prescribe with caution in geriatric population. Contraindications: Pregnancy Monitor: • Baseline serum bicarb level • Ammonia level in any patient experiencing unexplained lethargy, vomiting or changes in mental status • Decreased sweating or symptoms of hyperthermia—especially in summer months • Vision—has potential for causing visual field defects, eye pain, acute myopia and secondary angle closure glaucoma • Mood—has potential to increase the risk of suicidal thoughts or behavior Counsel: • Do not abruptly discontinue—requires gradual taper. • Do not crush or chew extended release capsule. • It decreases efficacy of oral contraceptives. • Avoid excess alcohol intake.

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
GLP-1 RA	Dulaglutide **TRULICITY**	Initial dose: 0.75 mg once weekly Max dose: 1.5 mg once weekly	2.7–3.6 kg	$$$$	• Abdominal pain • Constipation • Diarrhea • Headache • Hypoglycemia* • Indigestion • Nausea • Vomiting *Consider reduction of insulin and sulfonylureas to reduce risk of hypoglycemia	• Reduces appetite, increases satiety, • BG reduction	Significant cost, consider use of coupon (if insurance is not provided by government [e.g., VA or Medicare]) <u>Contraindications</u>: • Gastroparesis • Multiple endocrine neoplasia syndrome type 2 (MEN2) • Pancreatitis • Personal or family history of medullary thyroid carcinoma (MTC) • SI or past suicide attempts <u>Monitor</u>: • Blood sugar • Emergence of worsening mood, depression, or SI • Renal function in those experiencing severe GI SEs • Serum calcitonin levels • S/sx of cholecystitis and pancreatitis • Thyroid nodules <u>Counsel</u>: • Reduce meal size to increase tolerability. • Advise patients to avoid dehydration if experiencing diarrhea or vomiting to avoid ARF or worsening of renal function. • Pen teaching is required. • Use a new needle for every injection; do not share pen with anyone else. • Rotate injection sites.
	Exenatide **BYDUREON**	Initial dose: 5 mcg twice daily Max dose: May increase to 10 mcg twice daily after 4 weeks of 5 mcg dose *Administer 1 hour before morning and night meal					
	Exenatide **BYDUREON BCise**	2 mg once weekly					
	Liraglutide **VICTOZA**	Initial dose: 0.6 mg daily x 1 week Titration: 1.2 mg daily after 1 week Max dose: 1.8mg daily					
	Lixisenatide **ADLYXIN**	Initial dose: 10 mcg daily x 14 days Titration: 20 mcg daily on day 15 *Administer 1 hour prior to 1st meal of the day					
	Semaglutide **OZEMPIC**	Initial dose: 0.25 mg weekly x 4 weeks Maintenance dose: 0.5 mg once weekly Max dose: May titrate to 1 mg once weekly after 4 weeks of 0.5. mg dose					

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
Opioid antagonist	Naltrexone **REVIA**	Initial dose: 25 mg daily (1/2 tablet) Maintenance dose: 50 mg daily (1 tablet) Max dose: 100 mg daily (2 tablets)	Un-known	$$–$$$	• Abdominal pain/ cramping • Anxiety • Arthralgia • Depression • Diarrhea • Dizziness • Fatigue • Headache • Myalgia • Nausea • Nervousness • Somnolence • Syncope • Vomiting	May be helpful in treating patients that struggle with addictive behaviors to sweets (reduces palatability)	Cases of overdose with fatal outcomes have been reported after discontinuation of treatment and being subjected to opioids. Contraindications: • Concomitant use of opioids • Acute opioid withdrawal (allow opioid free period of at least 7–10 days) Monitor: • CK elevations • Liver function • Depression and SI or behavior Counsel: • Avoid prescribed, non-prescribed or illicit opioid use. • Will need non-opioid pain treatment when needed. • Notify provider if signs or symptoms of depression, worsening depression or SI appear.

Class / MOA	Medication name Generic/ BRAND	Typical Dosage/ Administration	Mean TBW Loss	Cost*	Common Side Effects	Positives (Advantages)	Considerations and Monitoring
SGLT-2 inhibitors	Canagliflozin **INVOKANA**	100 mg once daily or 300 mg once daily	2–3 kg	$$$	• Dehydration • Female genital infection • Hypoglycemia* • Mycosis • Nasopharyngitis • Polyuria • UTI • Vaginal itching *Consider reduction of insulin and sulfonylureas to reduce risk of hypoglycemia.	Positive CV effects, BP reduction, BG reduction, fluid reduction	Prescribe with caution in geriatric population. Correct volume depletion prior to initiation. Consider factors that increase risk of amputation (PVD, prior amputation, DM foot ulcers) <u>Contraindications</u>: • Dialysis • eGFR <45 • End stage renal disease • Type 1 DM <u>Monitor</u>: • Blood sugar • Blood pressure • Diabetic ketoacidosis • Renal function • Signs of dehydration <u>Counsel</u>: • Avoid excess alcohol intake. • Risk of GU infections • Risk of Fournier's Gangrene • Risk of dehydration • Hold x3 days prior to surgery. • Hold if vomiting/ diarrhea or increase fluid intake. • Report symptoms of dehydration, hypotension or ketoacidosis.
	Dapagliflozin **FARXIGA**	5 mg once daily or 10 mg once daily					
	Empagliflozin **JARDIANCE**	10 mg once daily or 25 mg once daily					
	Ertugliflozin **STEGLATRO**	Initial dose: 5 mg once daily Max dose: 15 mg once daily					

REFERRAL TO MEDICAL NUTRITION THERAPY AND GROUP THERAPY

Dietary modifications are an integral part of any successful weight-loss program. Each patient needs an in-depth individualized nutrition plan and should be referred to Medical Nutrition Therapy (MNT) provided by a registered dietitian (RD). MNT is a nutritional diagnostic, therapy and counseling service for the purpose of disease management.[20] MNT aims to help patients lose weight, maintain weight loss, and meet goals for blood pressure, cholesterol and glycemic targets. MNT is also often employed to delay or prevent diabetes complications.[21] If MNT is unavailable or cannot be achieved, apps or other free resources may provide an option (see section IV, Educational Resources).

ENERGY BALANCE

The American Academy of Nutrition and Dietetics recommends both decreasing energy intake and enhancing dietary quality, along with undertaking regular physical activity (150 minutes/week of moderate physical activity or 75 minutes/week of vigorous physical activity, followed by a maintenance routine of more than 250 minutes per week of moderate-to-vigorous physical activity) as essential to initiate and sustain weight loss.[17]

Evidence-proven dietary interventions to support weight loss include reducing caloric intake—especially of sweetened drinks—monitoring portions, engaging in low-carbohydrate, high-protein eating patterns and following proven eating plans, such as the DASH and Mediterranean plans, in concert with calorie restriction. It is important to note that, without accompanying caloric restriction, diets that restructure macronutrient intake, including the DASH and Mediterranean diets, have not been found to contribute to weight loss.[17]

The American Academy of Nutrition and Dietetics considers the following recommendations imperative for people who want to achieve sustained weight loss:[17]

- Women should be encouraged to aim for between 1,200–1,500 kcal/day, while men should aim for 1,500–1,800 kcal/day; alternatively, people should aim for a deficit of 500–750 kcal/day. Diets should provide adequate nutrition in combination with reduced calorie intake.
- Patients should be reminded that many healthy diets can help them lose weight, as long as they fall within the calorie-deficit parameters of 500–700 kcal/day.
- After weight loss, providers should help patients plan an individualized maintenance diet, representing both adequate nutrition and reduced caloric intake to sustain their lower body weight.*
- Similarly, patients should be reminded that many healthy diets can help them sustain weight loss, as long as they fall within calorie-deficit parameters of 500–700 kcal/day.

*Substantial weight loss through diet and exercise can decrease the initial RMR used for caloric intake calculations. Maintaining weight loss in the maintenance stage may require fewer calories than initially calculated or high levels of physical activity due to this metabolic adaptation.[22]

INDIVIDUAL AND/OR GROUP EXERCISE MOTIVATION CLASS

A sedentary lifestyle and obesity are closely linked. People who struggle with obesity may be ashamed to work out on their own due to stigmatization of obese individuals in society. Group exercise classes allow obese patients to exercise without the stigma. Beyond weight loss, participation in group fitness classes has been found to lead to a decrease in perceived stress and an increase in physical, mental and emotional quality of life compared to exercising independently or not engaging in regular physical activity at all.[23]

DRUG-INDUCED WEIGHT GAIN

A thorough medication reconciliation should be completed during the initial consult to identify medications that can contribute to weight gain. Common medication classes that cause weight gain include contraceptives, antidepressants, atypical antipsychotics and some diabetes medications.[19] Other medication classes with similar effects include beta blockers and corticosteroids.[19] Alternative medications that limit or eliminate weight gain potential should be considered and weighed against patient risk factors for obesity-related health complications.[19] Providers must keep this consideration in mind when prescribing first-line therapy or making medication changes.

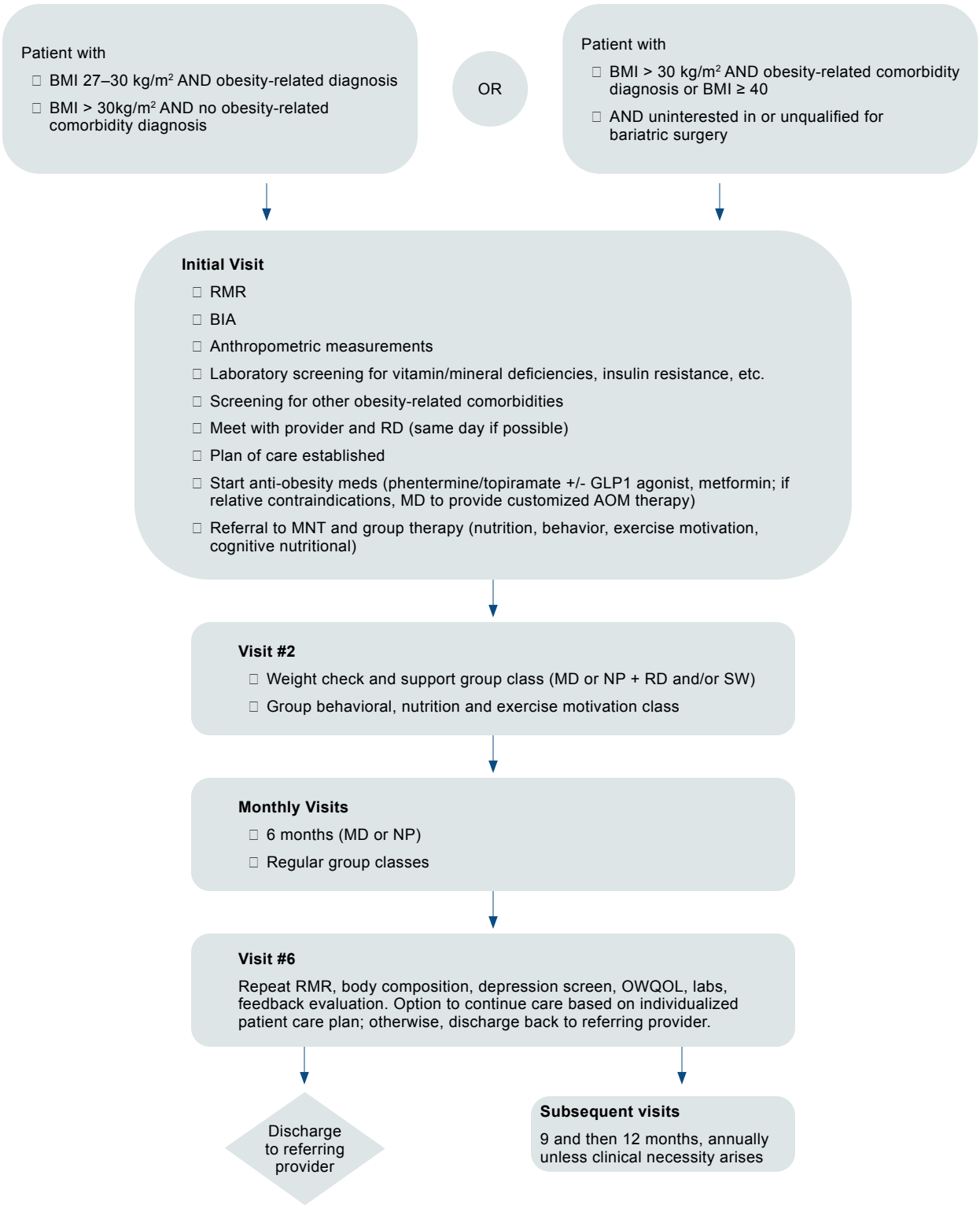
ONGOING CARE

It is important to have regular, established visits during a medical weight management program to reinforce behavioral and lifestyle changes and monitor progress. The visit pattern is monthly for the first six months, trimonthly for one year, then every 6–12 months.

SURGICAL WEIGHT-LOSS PATHWAY

Some patients should be considered for bariatric surgery as an initial weight loss therapy based on comorbidity and total weight loss needs. If medical management is not successful or if patients request a conversation about surgery, then they should be referred for consultation for surgical management.

ALGORITHM 2: MEDICAL PATHWAY



IV. EDUCATIONAL RESOURCES

- Baritastic is a nutrition and weight-tracking app for people on the bariatric surgery path. It contains numerous self-management, educational and motivational features, such as reminders, recipes, photo timelines and a bite-chewing timer. It also supports integration with a bariatric surgery program for patient monitoring, appointment reminders and communication with providers.
- Myfitnesspal.com provides free tools for food journaling and logging physical activity. The food journal contains a searchable food database and informs the user of the types and duration of exercise needed to burn consumed calories. It also features community boards and downloadable apps.
- MyPlate is a free app from choosemyplate.gov that allows users to set goals within food groups and choose and track food goals.
- American Diabetes Association provides information on the topic of weight management in relationship to diabetes management.
- American Society for Metabolic and Bariatric Surgery offers an online patient learning center providing information about the disease of obesity, bariatric surgery FAQs and more.
- The Obesity Society website features a section of patient-friendly downloads on a range of topics, including healthy pregnancy weight gain, the correlation between body weight and cancer risk, and more.
- Vanderbilt Weight Loss Center website (vanderbilthealth.com/service-line/weight-loss-center) features patient stories and helpful information, including a BMI calculator, bariatric nutrition guide, a video with bariatric surgeons answering patients' most common questions about surgical weight loss, and guidance about what patients need to ask of their health insurance providers.

V. REFERENCES AND CONTRIBUTORS LIST

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