Obesity Facts

Guidelines

Obes Facts 2025;18:514–533
DOI: 10.1159/000545605

Received: October 24, 2024
Accepted: March 18, 2025
Published online: April 3, 2025

Türkiye Consensus Report on the Multidisciplinary Obesity Treatment in Adults

Alper Sonmez[a] Fahri Bayram[b] Oktay Banli[c] Ibrahim Demirci[a] Sinem Kiyici[d] Meral Kucuk Yetgin[e] Taner Bayraktaroglu[f] Feray Akbas[g] Halil Coskun[h] Serhat Ocakli[i] Nihat Aksakal[j] Muhammed Taha Demirpolat[k] Samet Yardimci[l] Ferhat Cay[m] Gokcem Yalin Kocamaz[b] Dilek Yazici[n] Ozgur Sevim[o] Harun Karabacak[o] Hasan Altun[p] Zehra Yagmur Sahin Alak[q] Ceren Iseri[r] Asim Cingi[s] Halil Ozguc[t] Fatih Mehmet Avsar[u] Mustafa Taskin[c] Nihal Zekiye Erdem[v] Aziz Sumer[w] Mustafa Cesur[a] Eren Halit Taskin[x] Volkan Demirhan Yumuk[y]

[a]Department of Endocrinology and Metabolism, Ankara Guven Hospital, Ankara, Turkey; [b]Department of Endocrinology and Metabolism, Erciyes University Medical Faculty, Kayseri, Turkey; [c]Department of General Surgery, Ufuk University Medical Faculty, Ankara, Turkey; [d]Department of Endocrinology and Metabolism, Bursa School of Medicine, University of Health Sciences, Bursa Yuksek Ihtisas Training and Research Hospital, Bursa, Turkey; [e]Department of Coaching Education, Sports Health Sciences, Faculty of Sport Sciences, Marmara University, Istanbul, Turkey; [f]Department of Endocrinology and Metabolism, ZBEU Obesity and Diabetes Practice and Research Center, Zonguldak Bulent Ecevit University Faculty of Medicine, Zonguldak, Turkey; [g]Deparment of Internal Medicine, University of Health Sciences, Istanbul Training and Research Hospital, Istanbul, Turkey; [h]Department of General Surgery, Memorial Sisli Hospital, Istanbul, Turkey; [i]Department of General Surgery, Ankara Medipol University Medical Faculty, Ankara, Turkey; [j]Department of General Surgery, Istanbul University Medical Faculty, Istanbul, Turkey; [k]Department of General Surgery, Umraniye Training and Research Hospital Istanbul, Istanbul, Turkey; [l]Department of General Surgery, Medikal Park Pendik Hospital, Istanbul, Turkey; [m]Department of General Surgery, Balikesir University Medical Faculty, Balikesir, Turkey; [n]Department of Endocrinology and Metabolism, Medical Faculty, Koc University, Istanbul, Turkey; [o]Department of General Surgery, Etlik City Hospital Ankara, Ankara, Turkey; [p]Interbariatrics Clinic, Istanbul, Turkey; [q]Department of Endocrinology and Metabolism, Bursa Cekirge State Hospital, Bursa, Turkey; [r]Department of Nutrition and Dietetics, Faculty of Health Sciences, Istanbul Kent University, Istanbul, Turkey; [s]Department of General Surgery, Marmara University Faculty of Medicine, Istanbul, Turkey; [t]Department of General Surgery, Bursa Medicabil Hospital, Bursa, Turkey; [u]Department of General Surgery, Division of Surgical Oncology, Ankara Health Practice Research Center Hospital, University of Health Sciences, Ankara, Turkey; [v]Department of Nutrition and Dietetics, College of Health Sciences, Istanbul Medipol University, Istanbul, Turkey; [w]Nisantasi Health Consultancy Office, Istanbul, Turkey; [x]Department of General Surgery, Istanbul University-Cerrahpaşa, Cerrahpasa Medical Faculty, Istanbul, Turkey; [y]Division of Endocrinology, Metabolism and Diabetes, Istanbul University-Cerrahpaşa, Cerrahpaşa Medical Faculty, Istanbul, Turkey

karger@karger.com
www.karger.com/ofa

Correspondence to:
Alper Sonmez, alpersonmez@yahoo.com

Keywords
Obesity · Obesity council · Obesity treatment · Bariatric surgery

Abstract
Obesity is the world's most dangerous and rapidly growing health problem. Treating people living with obesity is not limited to the weight-loss process. They should also be followed up with a multidisciplinary approach to maintain the weight loss achieved. There is a lack of structural and functional standardization in obesity centers that undertake medical and surgical treatment. This consensus report, prepared by professional organizations for treating obesity, aimed to ensure that all obesity centers can perform standard patient management using evidence-based workflow diagrams. The report covers all the steps, starting from the initial evaluation process. It describes how to make treatment decisions jointly, defines the responsibilities of obesity councils, and designates the follow-up procedures of medically or surgically treated patients. The consensus report underlines that all healthcare professionals treating obesity are complementary. No discipline can achieve absolute success in treating people with obesity on its own. It is mandatory to implement a sustainable and practical collaboration based on current scientific evidence in treating and following up individuals with obesity.

Introduction

Obesity is a chronic, recurrent, and progressive disease characterized by the accumulation of excess energy, primarily in adipose tissue and ectopic regions, such as the liver, resulting from an intake of energy exceeding expenditure. This condition significantly limits life expectancy and quality of life [1–3]. Given its increasing prevalence, the diseases and complications it causes, loss of workforce, as well as its associated mortality and morbidity, obesity is one of the most critical health issues facing the world and Türkiye [4–6]. The most crucial strategy for overcoming the obesity pandemic is the implementation of local and community-based preventive measures [7, 8]. However, there is a pressing need for evidence-based treatment approaches that can help individuals with obesity return to healthy body weights as quickly as possible. Obesity does not result from a lack of willpower; it develops because of complex biological, environmental, and sociocultural factors and is inherited through multiple genes [9]. There is no standardized approach that is effective for every patient with obesity. Multidisciplinary approaches and long-term monitoring are required to control and maintain weight loss [2, 10, 11]. In the multidisciplinary treatment of obesity, increased physical activity and structured exercise programs supported by nutritional behavior change enhance the success of medical treatment [12] and improve the quality of life after bariatric surgery [13].

There is a significant need to establish multidisciplinary obesity treatment units to ensure the effective treatment and follow-up of individuals with obesity. These units should be structured to apply current scientific knowledge while considering the patients' social, cultural, and economic characteristics and should be tailored to the conditions of the country. This consensus report aimed to standardize the scientific approaches used by obesity treatment units in Türkiye to monitor and treat individuals with obesity. This will facilitate consistency in diagnosis, treatment, and follow-up approaches among these units and make it easier to monitor the outcomes of the ongoing fight against obesity.

This consensus guideline covers all practices performed by specialists, including general surgery, gastroenterological surgery, interventional radiology, plastic and reconstructive surgery, internal medicine, gastroenterology, and endocrinology, who treat obesity and its complications using medical or interventional (endoscopic, radiological, or surgical) methods. The treatment approaches defined in this guideline apply to all patients receiving obesity treatment, including those who visit Türkiye for health tourism.

Consensus Process

While preparing this consensus report, the capacities and staffing conditions of obesity treatment units in Türkiye were considered, and an approach was established to ensure that each unit could manage patients similarly. Representatives from the associations that created the consensus report first responded to all the topics themselves. Face-to-face and online meetings were held to discuss each topic. All recommendations agreed upon during the meetings were compiled into reports. While drafting the consensus report, the guidelines and consensus reports of major associations in Türkiye and around the world were also reviewed, and recommendations suitable for the conditions of our country were adopted [14–20]. The consensus document was finalized

after discussion by representatives of professional organizations in Türkiye involved in the medical and surgical treatment of obesity. The report was then reviewed and adopted by the executive boards of professional organizations.

Scope

The Türkiye consensus report on multidisciplinary obesity treatment in adults comprises recommendations on the following topics related to the general operations, duties and responsibilities, and physical environment of obesity treatment units:

- Duties and responsibilities of obesity treatment units
- Staffing
- Physical environment
- Equipment and devices
- Patients who can apply
- Management of patients admitted to obesity treatment units
- Patient evaluation by an obesity specialist
  - Medical history
  - Physical examination
  - Survey forms
- Laboratory tests required for individuals with obesity
  - Recommended basic examinations
  - Additional examinations that may be requested when necessary
- Consultations to be requested in case of need
- Dietitian assessment
- Psychologist assessment
- Structure and functioning of the obesity council
- Components of obesity treatment
  - Healthy lifestyle management
  - Medical treatment
  - Surgical treatment
- Procedures for patients who are planning to undergo endoscopic or surgical treatment
  - Medical evaluation
  - Dietitian assessment
  - Psychologist assessment
  - Exercise specialist assessment
  - Examinations to be performed before endoscopic or surgical treatment
    - Required examinations
    - Additional examinations, if necessary
  - Recommendations for patients before surgical treatment
  - Recommendations for postsurgical patient follow-up
    - Medical treatment
    - Nutritional plan
    - Exercise plan
- Patient follow-up standards in obesity treatment units
  - Patient follow-up with digital technologies
  - Number, frequency, and content of follow-up visits for patients undergoing medical or surgical treatment
  - In-person or phone/video conference follow-up visits

Duties and Responsibilities of Obesity Treatment Units

On one hand, obesity treatment units should provide the most appropriate treatment approach to patients based on evidence-based information and, on the other hand, assume long-term management of individuals who achieve weight control and maintain ongoing monitoring of individuals with obesity. To this end, an appropriate patient registry should be used. The responsibilities of obesity treatment units are outlined as follows [21–23]:

- Identification of comorbidities associated with obesity and its complications and management of metabolic and cardiovascular risk factors
- Implementation of current, evidence-based approaches for lifestyle management, medical nutrition therapy, pharmacological treatment, and surgical interventions
- Provide lifelong medical, social, and psychological support to individuals with obesity who achieve weight control

Staffing of Obesity Treatment Units

Centers may organize their staff according to existing personnel, needs, and resources [24, 25]. It is recommended that an ideal obesity center include the following healthcare professionals:

- Unit coordinator (depending on the features and capacities of the units, these roles can be filled by employed staff, medical secretaries, or nurses who may assume these duties when necessary)
- Medical secretary
- Nurse
- Dietitian
- Psychologist
- Exercise specialist
  - The unit should include professionals experienced in exercise planning, training, and exercise prescription, such as a physical medicine and rehabilitation specialist, sports physician, exercise physiologist, physiotherapist, or fitness trainer [26, 27].
- Obesity physician

  - Specialist in endocrinology and metabolism, internal medicine, or family medicine particularly focused on the treatment of obesity.
- General surgeon
  - General surgeon with an obesity surgery practice certificate issued by the Ministry of Health, General Directorate of Health Services
- Consultant physicians
  - Specialists to consult for comorbidities and complications as needed
    - Psychiatrist
    - Gastroenterologist
    - Cardiologist
    - Physical medicine and rehabilitation specialist
    - Orthopedics and traumatology specialist
    - Medical geneticist
    - Pulmonologist
    - Specialists for other potential diseases that may be identified

Physical Environment of Obesity Treatment Units

As the severity of obesity increases, the physical limitations of the patients also increase. For individuals with stage 3 obesity, navigating spaces that are not designed to accommodate body size, such as sitting in waiting areas or using restrooms, can pose significant challenges. Therefore, it is essential to design obesity units according to patients' physical characteristics, resolve as many procedures as possible within the same space, and minimize intra-hospital movement for examinations and consultations. The expected physical characteristics of an obesity unit are outlined below [24]:

- Furniture arrangement that facilitates comfortable seating and movement for individuals with obesity
  - Larger-than-standard seating groups with wider spacing in the waiting area
  - Restrooms with a larger interior volume and toilets capable of supporting weights >200 kg
  - Examination tables that are wide and capable of supporting weights >200 kg
  - Patient beds and stretchers are wide and capable of supporting weights >200 kg
  - Wheelchairs that are wide and capable of supporting weights >200 kg
  - Rooms with door widths and layout arrangements that accommodate easy entry and exit for wheelchairs or stretchers
- An integrated layout allows the processes to be completed without requiring visits to different departments within the hospital.
  - Secretary's desk
  - Nurse's station
  - Doctor's office
  - Dietitian's office
  - Psychologist/psychiatrist's office
  - Exercise specialist's office
    - This room is preferably equipped with facilities to demonstrate physical exercise applications.

Equipment and Devices in Obesity Treatment Units

- Essential equipment [24]
  - Sphygmomanometer with an obesity cuff (>34 cm)
  - Bioimpedance device
  - Height and weight scale (capable of measuring weights of ≥200 kg)
  - Measuring tape for waist and neck circumference
- Recommended equipment
  - Caliper for measuring skinfold thickness
  - Hand dynamometer (for evaluating sarcopenic obesity)
  - Polysomnography device
    - Units without a sleep laboratory can seek support from other healthcare institutions for polysomnography.

Patients Who Can Apply to Obesity Treatment Units

The scope of obesity treatment units should include all adults with obesity and its related conditions. Based on this understanding, the patient groups that may seek consultation at obesity treatment units are as follows:

- Individuals aged ≥18 seeking treatment for excess weight
- Individuals planned for bariatric/metabolic surgery
- Individuals referred for bariatric endoscopic procedures
- Patients referred by relevant disciplines (such as pulmonary, gastroenterology, cardiology, orthopedics, and physical therapy) for difficulties in treating the comorbidities of obesity
- Medically or surgically treated patients seeking follow-up and monitoring

Although the scope of obesity treatment units is defined above, these units should prioritize individuals most affected by obesity, specifically those with the highest body mass index (BMI) or the most severe obesity-related comorbidities. Given that one in three adults in Türkiye has obesity [28], it is clear that managing such a large patient load cannot be handled solely by obesity treatment units. Therefore, starting from the primary level, obesity should be addressed by healthcare facilities and professionals. At every level, a comprehensive action plan should be established within the healthcare system to recognize, detect, and refer to obesity and its associated diseases.

Management of Patients Admitted to Obesity Treatment Units

Treatment of obesity requires long-term monitoring and multidisciplinary approaches. During this process, it is essential to avoid unnecessary hospital visits and excessive biochemical and radiological analyses to prevent demotivation of individuals with obesity. Consultations should be planned based on individual needs. As the number of visits and waiting times increased for individuals with obesity, their adherence to treatment decreased. Therefore, the workflow in obesity treatment units should be organized to ensure efficient operation. The medical secretary or unit coordinator should manage appointment scheduling and patient admission processes to ensure timely referral to the appropriate departments. Some pre-examination measurements (such as arterial blood pressure, height, weight, waist circumference (WC), neck circumference, and bioimpedance measurement) can be conducted by a designated obesity nurse. She could also provide the patient with questionnaire forms to fill out and offer guidance on completing them. The management process for patients seeking treatment at an obesity treatment unit is summarized below [14, 15, 29, 30].

Patient Evaluation by an Obesity Specialist

The obesity specialist evaluates the patient's medical background and lifestyle by taking a medical history, performing a physical examination, planning the basic tests, and reading the questionnaire forms filled out by the patients. When needed, further laboratory tests can be planned by the obesity specialist, and the patient may be referred to other disciplines.

Medical History

- History of obesity in family or close contacts
- The process of weight gain and contributing factors
  - Weight during childhood and adolescence (pediatric epicrisis during childhood and adolescence may be requested)
  - Weight before and after marriage
  - For women, births, weight gained during pregnancy, date of last birth and postpartum weight, and menopausal status
  - Previous medical and surgical problems
  - Medications, especially those that cause weight gain (antihistamines, β-blockers, antipsychotics, antidepressants, corticosteroids, sulfonylureas, pioglitazone, insulin, pregabalin, and gabapentin) [31]
  - Stress factors
  - Family structure (living alone, nuclear family, and extended family)
  - Employment status (occupation, shift work, or irregular working conditions)
- Lifestyle review
  - Daily activity status, exercise habits, and sleep patterns
  - Food/nutrition-related behavior (depending on the unit's capacity, dietitians and psychologists may also conduct this query)
    - Number of meals and food preferences
    - Snacking preferences and frequency of eating out
    - Characteristics of the eating environment (screen time, table setting, etc.)
    - Screening for eating disorders (night eating, binge-eating, emotional eating, and food addiction)
  - Habits (alcohol, smoking, and substance use)
  - Questionnaire for analyzing to better understand the patients' nutrition and physical activity status
- Questioning diseases that cause obesity or develop due to obesity (Table 1) [14–16]
- Previous weight-loss attempts
  - Medication, exercise, and dietary interventions and their characteristics and duration are indicated separately
  - If successful, the extent, duration, and reasons for discontinuation

Questionnaire Forms

- The patients are given questionnaire forms and instructed on how to fill them out. They can fill out the forms before the first visit if they have time or bring their forms to the next visit. The questionnaire forms help obesity doctors, dieticians, or psychologists to better understand patients' physical and mental health, nutritional behavior and determine if additional examination is needed for diseases commonly associated with obesity, such as depression, sleep disorders, and obstructive sleep apnea syndrome (OSAS).
- Nutrition record (to be kept for 3 days, including one weekend day)
- PHQ-9 form for depression screening (online suppl. Material 1; for all online suppl. material, see https://doi.org/10.1159/000545605) [32]
- STOP-BANG questionnaire for OSAS screening (online suppl. Material 2) [33, 34]
- Additional screening questionnaires or survey forms may be provided according to the units and patients' conditions

Physical Examination

- Assessment of findings related to diseases causing or resulting from obesity (Table 2)

Table 1. Diseases and complications associated with obesity [14–16]

Metabolic diseases
Hypertension
Pre-diabetes
Type 2 diabetes
Dyslipidemia
Cardiovascular diseases
Coronary artery disease
Atrial fibrillation
Stroke
Venous insufficiency
Pulmonary diseases
Asthma
OSAS
Hypoventilation syndrome
Liver diseases
Metabolic dysfunction-associated steatotic liver disease
Cholelithiasis
Gastrointestinal diseases
Gastroesophageal reflux
Pancreatitis
Genitourinary diseases
Polycystic ovary disease
Gonadal dysfunction
Urinary incontinence
Cancer
Breast, uterus, cervix, colon, esophagus, and stomach
Musculoskeletal diseases
Osteoarthritis
Gout

- Establishing the degree of overweight (can also be done by a nurse, depending on the unit's capacity and appropriateness)
  - Height, weight, and BMI (BMI = weight/height^2) [35]
    - Preferably measured in underwear or light clothing and shoes removed
  - WC [15, 36]
  - The tape measure should be parallel to the ground and should not be too tight or loose.
    - Measurement should be taken after the patient has exhaled.
    - Measurements are taken along a horizontal line through the midpoint between the subcostal region and anterior superior iliac spine, parallel to the ground.
    - Gas, bloating, fullness, and pregnancy are factors that affect measurements.
    - WC measurements are not recommended for individuals with BMI >35 kg/m^2.
  - Neck circumference [37, 38]
    - Measured with shoulders relaxed and the body upright at the midpoint of the neck (in men, just below the laryngeal prominence), passing through the mid-cervical-point on the back
    - Measurements may be higher in individuals with diffuse goiter, pregnant or breastfeeding women, and patients with Cushing's.
  - Body composition measurement with bioimpedance device [39, 40]
    - The individuals to be measured should have fasted for at least 2–3 h, not engaged in exercise, not consuming coffee, and not being dehydrated. It is preferable to avoid fluid intake 1–2 h before the measurement.
    - Bioimpedance devices lack standardization, and there is significant variability between measurements. Many confounding factors can affect the results, including position, satiety, and diurnal variability. Therefore, the units should consider these factors and monitor the coefficient of variation between their measurements.
    - Bioimpedance measurement is not appropriate for patients with intracardiac devices or metal implants and during pregnancy.

Laboratory Tests and Imaging Procedures Are to Be Requested for Individuals with Obesity

During the diagnostic evaluation of individuals with obesity, requesting many laboratory tests is unnecessary. If diseases and complications are associated with obesity, or if an endocrine disorder is suspected to cause obesity, laboratory tests related to these conditions may be planned separately. The measurement of insulin resistance (HOMA-IR, QUICKI, MATSUDA, etc.) does not play a role in the clinical diagnosis and follow-up of individuals with obesity. The recommended laboratory tests for individuals with obesity are listed below [15, 16, 30].

Recommended Basic Tests

- Complete blood count; fasting blood glucose (FBG); lipid panel (total cholesterol [C], high-density lipoprotein [HDL] C [HDL-C], low-density lipoprotein

Table 2. Evaluation of findings related to diseases causing or resulting from obesity

Head and neck	Increased neck circumference Skin tags in the head and neck region Increased pigmentation in the neck area (acanthosis nigricans) Fat accumulation in the nape (buffalo hump) Hair and eyebrow loss (hypothyroidism) Hirsutism and male pattern hair growth in women (polycystic ovary syndrome)
Body	Increased abdominal circumference Stretch marks on the abdomen (white to silvery or red)
Extremities	Skin thinning in the lower extremities Signs of stasis (edema and skin discoloration) Signs of peripheral circulatory disorders (cyanosis, hyperkeratosis, and pre-ulcerative lesions)
Cardiac system	Arrhythmias Signs of venous stasis and lower extremity edema Shortness of breath that worsens with exertion or when lying down
Respiratory system	Decreased lung sounds Findings related to obstructive respiratory problems
Psychological state	Reduced self-care Social withdrawal Sleep problems

[LDL] C [LDL-C], and triglycerides); creatinine; estimated glomerular filtration rate; liver enzymes (aspartate aminotransferase [AST], alanine transaminase [ALT], and gamma-glutamyl transferase); uric acid; thyroid-stimulating hormone; vitamin B12; vitamin D; ferritin; and urinalysis
  - Fib-4 score
    - This score, which indicates the risk of liver fibrosis, can be easily calculated online by inserting age, platelet count, and AST and ALT levels into the following formula [41]:
    - (FIB-4 = age (years) × AST (U/L)/(platelet [10^9/L] × ALT1/2 [U/L])
    - A Fib-4 score >1.3 requires referral to a gastroenterology/hepatology specialist and further evaluation
  - Hepatobiliary ultrasonography (USG)
  - Electrocardiography (ECG)

Additional Examinations that May Be Requested when Necessary

- Glycated hemoglobin (HbA1c)
  - Requested if previous FBG measurements are elevated or if there is a history of diabetes
- Dexamethasone suppression test
  - It is a screening test for symptoms and findings suggestive of Cushing's. If cortisol levels are not suppressed by 1 mg dexamethasone, further tests are conducted [42].
- Total testosterone
  - Requested for symptoms and findings suggestive of hypogonadism in men. Two low morning values confirmed this diagnosis. If the testosterone levels are borderline, bioavailable testosterone measurements are required [43].
- Polysomnography
  - Requested if symptoms suggestive of obstructive sleep apnea are present or if the STOP-BANG questionnaire score is ≥ 3 (online suppl. Material 2) [33, 34]
- Beta human chorionic gonadotropin
  - Should be requested if medical, surgical, or interventional treatments are planned or radiological tests are to be performed on women of childbearing age
- Genetic tests
  - Can be requested if a history and physical examination findings suggest monogenic and syndromic obesity
- Luteinizing hormone, FSH, estradiol, progesterone, and prolactin levels and pelvic USG
  - Evaluation of gonadal function in women with menstrual irregularities, chronic anovulation, or infertility

Consultations to Be Requested in Case of Need

- Psychiatry
  - Features suggestive of an eating disorder

    - Night eating, binge eating, emotional eating, and food addiction
  - Diagnosis or suspicion of depression
    - High score on the PHQ-9 questionnaire
    - Antidepressant use
  - Sleep disorders
  - Drug and substance addictions
  - History of other psychiatric disorders
- Psychosis, anxiety disorder, etc.
- Pulmonology
  - Asthma
  - Diagnosis or suspicion of OSAS
- Gastroenterology
  - Elevated liver enzymes
  - High Fib-4 score (>1.3)
- Cardiology
  - Suspicious ECG findings
  - Individuals with known cardiovascular disease or at high risk of cardiovascular disease
  - Middle-aged or older individuals with obesity, who are starting an exercise program for the first time after previously leading a sedentary lifestyle
- Orthopedics/physical therapy/sports physician
  - Heel spur
  - Osteoarthritis
  - Musculoskeletal injuries
  - Mechanical issues such as limb loss or joint prosthesis

Dietitian Assessment

- Determining basal metabolic rate and daily energy requirements
- Creating a nutrition diary
  - Determining daily calory intake and macronutrient and micronutrient ratios
- Identifying eating habits
  - Preferred or avoided foods and drinks (especially foods and drinks that could contribute to obesity)
  - Distribution of energy intake across meals
  - Meal frequency and timing
  - Snacks between meals
- Recording evaluation notes and opinions regarding the need for nutritional therapy in the patient's file

Psychologist Assessment

- Assessment for depression (PHQ-9 questionnaire)
- Screening for eating disorders (emotional eating, night eating, etc.)
- Identification of cognitive and environmental issues
- Evaluation of problem-solving skills, stimulus control, and self-control
- Record evaluation notes and opinions regarding the need for psychotherapy in the patient's file

Structure and Functioning of the Obesity Council

- It is essential that the council establishes a treatment plan for patients with obesity.
- The members of the obesity council are
  - Obesity physician
  - General surgeon
  - Dietitian
  - Psychologist
  - Exercise specialist
  - Other specialties invited when necessary
- The treatment approach and goals are identified, and a division of labor is made in the council.
- Other disciplines already evaluate the patient, and problems are identified before attending the council.
- The council does not necessarily need to meet each case physically. Cases in which consensus cannot be reached, especially regarding treatment decisions, are discussed in the council.
- Consultation with the relevant specialist and writing an opinion on an official document (such as a consultation or surgery approval form) also serve as a council decision.
- The treatment approach, goals, and decisions should be entered into and/or recorded in the registration system.

Components of Obesity Treatment

Healthy Lifestyle Management

- The dietitian provides a nutritional plan in which the following factors are customized for the individual:
  - Meal frequency
  - Daily energy intake
  - Amount and source of macro- and micronutrients
- The exercise specialist writes individualized exercise prescription.
- The type, duration, intensity, and frequency of exercise are tailored to the individual, considering their capabilities, special conditions related to exercise, and exercise history.
  - Education is provided regarding the complementary role, importance, and necessity of exercise in obesity treatment.
  - During follow-up appointments, individuals' adherence to the exercise prescription and motivation for participation in exercise are evaluated, and the exercise prescription is renewed if necessary.
- Cognitive therapy is planned by the psychologist for individuals in need.
  - Problem-solving, impulse control, management of eating behavior, sleep hygiene, etc.

Medical Treatment

- Obesity medications are initiated in cases that have not achieved sufficient success with lifestyle management and meet the following criteria [15]:
  - Patients with a BMI >27 kg/m^2 who have comorbidities related to obesity
  - Patients with a BMI >30 kg/m^2
- If the patient is using a medication that causes weight gain, it is either switched to a treatment that does not cause weight gain or discontinued if possible.
- The addition of medications recommended by other specialists (antidepressants, anxiolytics, asthma medications, antihypertensives, etc.) to the treatment plan is also considered.

Surgical Treatment

- When making a surgical treatment decision, the evaluations of relevant specialists listed below for pathologies that may contraindicate surgery must be included in the patient's file.
  - Psychiatrist
  - Endocrinologist or internal medicine specialist
- Before deciding on surgical treatment, it should be established that patients do not benefit from medical treatment or lifestyle changes for a reasonable time (at least 6 months). However, it is not advisable to waste time before surgical treatment in patients with a history of previous unsuccessful treatment attempts or those who cannot use medical treatment due to side effects, economic reasons, or other reservations. In such cases, the council may decide whether to perform surgery.
- BMI should not be the sole criterion for bariatric or metabolic surgery decisions. The presence of comorbid diseases, severity of these diseases, complications they cause, psychological problems arising from obesity, physical limitations, outcomes of previous treatment attempts, and socioeconomic and cultural status of the patients should also be considered. When deciding on surgical treatment, the Edmonton Obesity Staging System shown in Figure 1 is a guiding tool (Table 3) [44].
- Patients with obesity-related diseases (Edmonton Stage 2), complications due to these diseases (Edmonton Stage 3), or severe end-stage complications (Edmonton Stage 4) are prioritized candidates for medical and surgical treatment of obesity. For Edmonton Stages 0 and 1 patients, lifestyle changes should be prioritized and pushed for longer.
- In cases where lifestyle management or medical treatment attempts have been unsuccessful, the bariatric/metabolic surgery decision-making process is summarized below (Table 4) [14, 17, 18, 45–47].
  - Individuals with a BMI ≥40 kg/m^2
  - Patients with a BMI of 35–39.9 kg/m^2 who are in Edmonton Stage 2 or higher
  - Patients with a BMI of 30–34.99 kg/m^2 who have type 2 diabetes that is not regulated by other methods or who are Edmonton Stage 3 or higher
  - Bariatric/metabolic surgery is not performed in patients with BMI <30 kg/m^2.
- For patients whose treatment costs are covered by the state, a waiting list should be established in public institutions, prioritizing those with the highest BMI levels and Edmonton stages. There are 20 million individuals with obesity in Türkiye, and approximately 2 million adults have stage 3 obesity (BMI >40 kg/m^2) [28, 48]. Field studies indicate that 10% of individuals with type 2 diabetes have stage 3 obesity (approximately 700,000 cases), and 1% have a BMI of >50 kg/m^2 (approximately 70,000 people) [49].

Procedures for Patients Who Are Planning to Undergo Endoscopic or Surgical Treatment

Methods adopted by national and international organizations should be used in the surgical and interventional treatment of obesity (Table 5) [50–52]. The use of other interventional methods that do not yet have sufficient evidence regarding short- and long-term outcomes is currently not recommended for the treatment of obesity (Table 6) [53, 54]. It is recommended that appropriate legal permits be obtained for these methods, that the patient should be informed both written and orally, and that a signed consent form be obtained. All methods applied in bariatric/metabolic surgery are effective in treating type 2 diabetes. Additionally, no specific surgical procedure is defined under "Diabetes Surgery." Patients should undergo a thorough medical evaluation before endoscopic or surgical treatment. For this purpose, patients' medical conditions should be reviewed by the relevant physicians, and they should be informed by a dietitian, psychologist, and exercise specialist about lifestyle changes after treatment and how they should adapt to this new lifestyle. The scope of these evaluations is outlined below.

Medical Evaluation

- Patients who underwent bariatric/metabolic surgery are evaluated for comorbidities and complications by the physicians responsible for the obesity team (Table 1). Cases deemed necessary are referred to relevant specialists, and their opinions are sought before surgery.

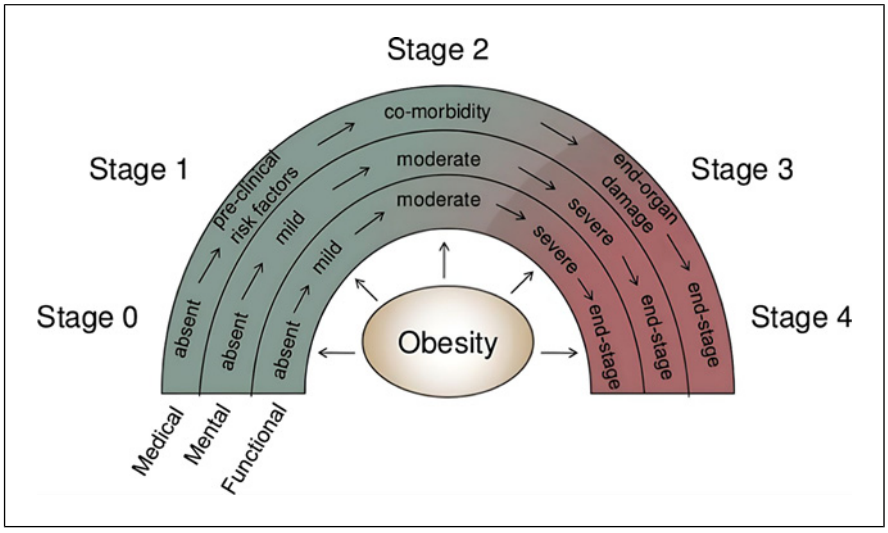

Fig. 1. Edmonton Obesity Staging System [44]. Permission is obtained from Professor Arya Sharma by personal communication.

Table 3. Edmonton Obesity Staging System [44]

Obesity stage	Definition
0	No comorbidities, psychopathology, or functional limitations associated with obesity (e.g., normal blood pressure, serum lipids, fasting glucose, eGFR >90 mL/min, etc.)
1	Pre-clinical conditions associated with obesity, mild physical symptoms, psychopathology, or functional limitations (e.g., Pre-hypertension, pre-diabetes, dyslipidemia (LDL-C >130 mg/dL, total cholesterol >200 mg/dL, HDL-C <40 mg/dL, TG >150 mg/dL), fatty liver disease (Fib-4 Score <1.3), elevated liver enzymes, eGFR 60–90 mL/min, moderate exercise-related dyspnea, joint pain, fatigue, etc.)
2	Obesity-related diseases, moderate restrictions in daily activities or well-being (e.g., hypertension, type 2 diabetes, obstructive sleep apnea, fatty liver disease (Fib-4 score >1.3), osteoarthritis, gastroesophageal reflux, polycystic ovary syndrome, anxiety disorder, depression, psychological issues affecting education or daily life, etc., eGFR 30–60 mL/min)
3	Obesity-related organ damage, severe physical limitations, psychopathologies (e.g., myocardial infarction, heart failure, eGFR <30 mL/min, complications of diabetes, osteoarthritis severely restricting movement, etc.)
4	Severe (potentially end-stage) disabilities due to obesity-related diseases, severe psychopathologies that impair the ability to work, severe functional limitations, or severe impairments in well-being (e.g., liver cirrhosis, resting dyspnea, wheelchair-bound patient, etc.)

eGFR, estimated glomerular filtration rate.

- Pulmonologist
  - Cases suspected of having OSAS, hypoventilation syndrome, or chronic obstructive pulmonary disease are referred.
- Cardiologist
  - Individuals at medium and high risks (recent myocardial infarction, unstable angina, uncompensated heart failure, high-grade arrhythmia, or hemodynamically significant valvular heart disease) should be evaluated by a cardiologist before surgery.
- Gastroenterology/general surgery specialist
  - Before bariatric/metabolic surgery, upper gastrointestinal endoscopy is performed to evaluate the esophagus, stomach, and duodenum.

Dietitian Assessment

- Before surgery, the patient's eating habits are assessed, nutritional education is provided, and a nutrition program is developed.

Table 4. Decision-making algorithm for surgical treatment of obesity in individuals where lifestyle changes and medical treatment have not been effective for a reasonable duration [14, 17, 18, 45–47]

Edmonton Staging	Body mass index (BMI)		
	30–34.9 kg/m^2	35–39.9 kg/m^2	>40 kg/m^2
Stage 0			
Stage 1			
Stage 2			
Stage 3			
Stage 4	*	*	*

Surgical treatment may be considered. Green highlight denotes the area of decision. *Surgical treatment is applicable if the benefits outweigh the risks.

- The timing of transitioning to liquid, soft, and solid foods after surgery and which foods will meet macro- and micronutrient needs are explained.
- Nutritional education also includes food labels, appropriate portions, snack and beverage alternatives, food preparation and grocery shopping, and topics related to achieving and maintaining health and sufficient weight loss in the long term.

Psychologist/Psychiatrist Assessment

- The goal is to determine any previously undiagnosed psychiatric disorders and whether the surgery candidate is willing to make the necessary lifestyle changes for sustainable weight loss.
- Factors that contraindicated bariatric/metabolic surgery, such as untreated major depression or psychosis, uncontrolled and untreated eating disorders (e.g., bulimia), and active substance or alcohol abuse, are assessed.
- Patients are also informed about their new life after bariatric/metabolic surgery.
- After bariatric surgery, psychosocial problems related to interpersonal relationships, body image, and daily functioning may arise.

Exercise Specialist Assessment

- The patient's current environmental, sociological, and economic conditions are assessed to gather information for developing an exercise prescription. An individual exercise prescription is created by considering the medical history and energy balance in the dietitian's treatment plan.
- To determine whether the patient should start a regular exercise program before surgery, the patient's BMI level, physical disabilities, the presence of diseases accompanying obesity, cardiological findings and symptoms that will affect the physiological response to exercise, exercise readiness and motivation, and the adequacy of the preparation period until the surgery date are reviewed.
- Ineligible patients should not be forced to start an exercise program before surgery, and exercise planning should be deferred after surgery.
- Walking should be recommended during the preoperative preparation phase. However, resistance exercises should be emphasized after surgery to maintain muscle mass and basal metabolic rate.

Examinations to Be Performed before Endoscopic or Surgical Treatment

Recommended Laboratory Examinations. The following laboratory examinations are recommended:

- Biochemistry tests
  - Complete blood count, urinalysis, FBG, lipid panel (total C, HDL-C, LDL-C, and triglycerides), creatinine, estimated glomerular filtration rate, liver enzymes (AST, ALT, and gamma-glutamyl transferase), calcium, uric acid, thyroid-stimulating hormone, HbA1c, ferritin, folic acid, vitamin B12, vitamin D, PTZ INR, and blood type determination.
- ECG
- Posteroanterior chest X-ray
- Complete abdominal USG

Additional Examinations, if Necessary. Additional examinations include the following:

- Vitamin A, vitamin B1 (Thiamine), zinc, and copper
- May be requested in the presence of risks and symptoms before hypoabsorptive surgery
- C-peptide, anti-glutamate decarboxylase, and other autoantibodies
- Requested to exclude the possibility of type 1 diabetes in individuals with Stage 1 obesity (BMI 30–34.9 kg/m^2) before metabolic surgery aimed at glycemic control.

Table 5. Methods adopted by international organizations for the surgical and interventional treatment of obesity [50–52]

Method	Weight loss	Advantage	Disadvantage
Laparoscopic adjustable gastric band	20%–25%	No anatomical change Adjustable Removable	Erosion, sliding/rotation
Sleeve gastrectomy	25%–30%	Easy to apply, no anastomosis required, low complication rate, long-lasting metabolic effect	Leakage risk GERD 20%–30% Limited data over 5 years
Roux-en-Y gastric bypass	30%–35%	Strong metabolic effect can be used for post-sleeve correction Low risk of GERD	Micronutrient deficiency The chances of revision surgery are low
Biliopancreatic diversion with duodenal switch	35%–45%	Very strong metabolic effect Sustainable and effective weight loss Can be a second stage after sleeve gastrectomy	Malabsorption GERD Technical difficulty
Single anastomosis duodeno-ileal bypass and sleeve gastrectomy (SADI)	35%–45%	Easier than biliopancreatic diversion Strong metabolic effect Low complication rate	No long-term data High risk of malabsorption
Single anastomotic gastric bypass	35%–45%	Strong metabolic effect, easier than Roux-en-Y Low risk of mesenteric defect	Bile reflux Limited experience Malabsorption
Gastric balloon	10%–12%	High safety profile Easy to implement	Temporary effect Nausea, vomiting, pain Early removal
Transpyloric bulb	14%	Applied endoscopically Delays gastric emptying	Short-term data Stomach ulcer
Vagal nerve blockade	8%–9%	Low complication rate No anatomical changes	Pain at the application site
Endoscopic sleeve gastroplasty	12%–20%	Advantageous in patients with difficult access to the upper abdomen Effective in reducing anastomosis diameter in gastric bypass patients with weight regain. It can be used as a first-line treatment in patients with stage 3 obesity	High cost Difficult to reverse May complicate secondary surgeries Sutures can be opened in an operator-dependent manner

- Beta human chorionic gonadotropin
- To exclude the possibility of pregnancy in women
- Cancer screening
- Breast USG, mammography in individuals >40 years of age
- Colonoscopy (in individuals >50 years of age)

Recommendations for Patients before Surgical Treatment

- Patients should quit smoking at least 6 weeks before the surgery [55].
- If there is heavy alcohol use, it should be discontinued before the surgery.
- To reduce the risk of thromboembolism, it is recommended that those taking oral contraceptives or perimenopausal hormone replacement therapy stop them 1 month before the surgery.
- Implementing a very low-calorie diet 2–4 weeks before surgery can reduce liver volume and visceral fat, particularly in patients with BMI ≥50 kg/m^2. This can shorten the surgical time and increase the chance of success [56].
- Vitamin and mineral deficiencies should be corrected preoperatively. To eliminate the need for costly micronutrient screening after the surgery, multivitamin complexes containing vitamin B1 can be started orally 1 month before the surgery [57, 58].

Table 6. Methods not adopted by international organizations for the surgical and interventional treatment of obesity [53, 54]

Method	Weight loss	Advantage	Disadvantage
Aspiration therapy	12%–14%	Applied endoscopically Regulates/changes feeding behavior	Tube-related complications Early removal rate 25%
Endoscopic-hybrid gastrointestinal bypass devices	12%–20%	Can be applied in a hybrid manner using magnets, both endoscopically and laparoscopically. Standard and safe anastomosis, low risk of bleeding	Insufficient evidence, still in the experimental phase
Laparoscopic gastric plication	12%–25%	Low cost	Sutures may open in the long term. No long-term randomized controlled trials
Bariatric arterial embolization	1%–12%	Easy to implement, less invasive	Low level of evidence and insufficient studies. Can only be performed in interventional radiology units
Botox injection	1%–12%	Can provide temporary gastroparesis. Easy to apply	The products are not FDA-approved Risk of systemic toxicity and morbidity when high doses are used
Ileal interposition	25%–35%	Long-term remission rates in type 2 diabetes mellitus patients are high	Rates of anastomotic leak and long-term morbidity are higher. High-level evidence is lacking
Transit bipartition and its variations (including sleeve + jejuno-ileal bypass)	30%–35%	Less malabsorption and vitamin and mineral deficiencies compared to gastric bypass and its variations. Access to the duodenum is possible. No excluded bowel segments	Limited high-level evidence Anastomosis calibration and technical standards are inadequate
Sleeve + fundoplication procedures	12%–20%	Advantageous in terms of endoscopic control for GERD and intestinal metaplasia	High early-stage complication rate

- If a patient has diabetes, it is recommended to achieve glycemic control, discontinue oral antidiabetic drugs during the perioperative period, and initiate insulin therapy if necessary.

Patient Follow-Up after Surgical Treatment

- Medical treatment
  - In individuals with diabetes, antidiabetic treatment is reduced or discontinued on the basis of postoperative blood glucose monitoring.
  - During weight loss, the dosages of other chronic treatments (e.g., levothyroxine and antihypertensive agents) are adjusted.
  - Proton pump inhibitors must be used, especially in smokers and patients who have undergone gastric bypass, to prevent ulcer development [59].
  - Multivitamin and mineral supplementation is provided to prevent micronutrient deficiencies (Table 7) [50, 60–62].
  - Ursodeoxycholic acid 600 mg/day is administered for 6 months to reduce stone formation [63, 64].
- Nutritional plan
  - Days 1 and 2
    - Phase 1: clear liquid diet. It is administered for 1–2 days at the hospital. Clear liquids should be initiated a few hours after the surgery.
  - Day 3 (discharge) and the following 2 weeks
    - Phase 2: full liquid diet (discharge diet). This begins on the 2nd or 3rd day after surgery, and the patient is usually discharged on the day they start this diet. It lasts for 10–14 days and should consist of full liquids, including clear liquids.
  - Days 15–30
    - Phase 3.1: pureed, soft-texture diet. Clear liquids should be increased. The diet should consist of soft-textured foods (chopped, ground, or pureed) containing proteins, carbohydrates, fats, and fiber. The duration of this diet depends on the type of surgery and the patient's tolerance to food.
  - Days 30–45
    - Phase 3.2: mechanically modified soft foods diet. The diet is texture-modified and requires minimal chewing. It should consist of ground, pureed, diced, or minced food.

  - Days 45–60
    - Phase 3.3: mechanically modified soft foods diet. This phase includes thicker foods and is reached during the 6th to 8th weeks after surgery. If tolerated, the diet should include salads, fruits, protein-rich foods, and beverages.
  - Day 60 and lifelong
    - Phase 4: healthy, balanced solid foods diet. This diet is started once Phase 3.3 is tolerated. It is applied when the patient is stable and has reached maintenance weight.
- Exercise plan
  - The type of surgery and potential complications are critical factors in determining when a patient can start an exercise program postoperatively. Immediately after surgery, patients started walking for 20–30 min daily.
  - Two weeks later, low-to-moderate-intensity aerobic exercises (such as walking, stationary cycling, or swimming) are gradually introduced.
  - After 6 weeks, resistance exercises can be incorporated into the program.
  - Ten weeks post-surgery, once wound healing is complete and the risk of abdominal hernia is minimized, abdominal exercises (such as crunches, push-ups, and planks) can be added.
  - During routine follow-up, the patient's exercise gains are evaluated, the exercise plan is updated, and the patient's progress with exercise is documented.

Patient Follow-Up Standards in Obesity Treatment Units

Obesity is a chronic and progressive disease that is characterized by remission and relapses. Therefore, individuals with obesity should be monitored regularly regardless of their treatment. At each follow-up visit, anthropometric measurements are recorded to assess the level of weight loss and whether weight control goals are achieved. Compliance with medical treatments, nutrition, and exercise plans is reviewed and medications for comorbid conditions are adjusted. Laboratory tests are performed at regular intervals, based on the nature of the treatment administered. The frequency of follow-up visits, tests to be requested during these visits, and issues to be reviewed vary between patients receiving medical treatment and those undergoing surgical treatment. For patients receiving medical treatment, medication adherence and side effects are primarily reviewed during the initial visits. In patients undergoing obesity surgery, wound healing and nutritional adequacy are the primary focus of the review.

During patient follow-up, efforts are made to resolve treatment-related issues, increase patient motivation, and enhance treatment adherence. Although face-to-face follow-up visits are preferred, utilizing telemedicine applications and digital technologies to manage conditions such as obesity, which require frequent monitoring, will improve patient adherence [65].

Obesity software that can be used across all obesity treatment units should be developed to record patient data and regularly conduct standardized patient monitoring. This software allows different healthcare professionals within the same unit to access patient information, statistically evaluate patient progress, and enable more effective patient monitoring.

Patient Follow-Up with Digital Technologies

Wearable digital technologies, such as smartphones, smartwatches, and skin sensors, are highly beneficial for maintaining health records. Additionally, continuous glucose monitoring systems, Bluetooth-connected blood pressure measurement systems, and scales enable direct transmission of anthropometric and clinical data to healthcare professionals. This facilitates the close monitoring of patients' lifestyles and health-related development. Therefore, digital technology should be recommended and encouraged for all patients.

In patients with obesity, the following parameters can be monitored using digital technologies:

- Physical activity
  - Number of steps
  - Exercise duration, intensity, type, frequency, and weekly exercise volume
  - Calories burned through physical activity
- Nutrition (can be photographed and digitally calculated or selected from a list)
- Meal frequency and times
  - Nutrient content and total calorie intake
  - Fiber and macronutrient ratio
- Capillary glycemia levels
  - Glycemic fluctuations
  - Time spent in the target range
- Vital signs
  - Blood pressure and pulse rate
  - Respiratory rate
  - Oxygen saturation
- Sleep recordings
  - Sleep duration, sleep quality, length of rapid eye movement, and presence of apnea

Table 7. Recommendations for multivitamin and mineral supplementation after bariatric/metabolic surgery [50, 60–62]

	Replacement doses				Considerations
	AGB	SG	RYGB	BPD/DS	
Number of multivitamin + mineral tablets (containing thiamine, iron, selenium, zinc, and copper), /day	1	2	2	2	After all bariatric procedures, a daily supplement containing the recommended amounts of multivitamins and minerals should be taken If the current preparations do not contain the recommended vitamins and minerals in sufficient amounts, they should be taken as separate supplements
Calcium, mg/day	1,200–1,500	1,200–1,500	1,200–1,500	1,800–2,400	Should be taken in divided doses Calcium carbonate should be taken with meals Calcium citrate can be taken independently of meals
Vitamin D 3,000 IU/day	✓	✓	✓	✓	25(OH) vitamin D >30 ng/dL
Vitamin B12 350–1,000 µg/day orally 1,000 µg/month im	✓	✓	✓	✓	
Folic acid 400–800 µg/day	✓	✓	✓	✓	Women of childbearing age are given 800–1,000 µg daily
Thiamine 12 mg/day	✓	✓	✓	✓	In individuals with symptoms such as prolonged vomiting, dysphagia, and rapid weight loss, higher doses of thiamine (50–100 mg) may be necessary to prevent the development of Wernicke's encephalopathy
Elemental iron Men: 18 mg/day Fertile women: 45–60 mg/day	✓	✓	✓	✓	Should be taken in divided doses and separately from medications that reduce absorption, such as antacids and calcium
Vitamin A, IU/day	5,000	5,000–10,000	5,000–10,000	10,000	
Vitamin E 15 mg/day	✓	✓	✓	✓	
Vitamin K, µg/day	90–120	90–120	90–120	300	
Zinc, mg/day	8–11	8–11	8–22	16–22	To minimize the risk of copper deficiency, the supplementation protocol should include 8–15 mg of zinc per 1 mg of copper
Copper, mg/day	1	1	2	2	Tests to be requested during follow-up after interventional treatment of obesity

Table 8. Recommended biochemical tests after interventional treatment of obesity [50]

	Month 1	Month 3	Month 6	Month 12	Month 18	Month 24	Annual
Complete blood count (CBC), FBG, urea, creatinine, AST, ALT, lipid panel, total protein, and albumin	√	√	√	√	√	√	√
Vitamin B12		√	√	√	√	√	√
Iron, iron binding capacity, ferritin, folic acid		√	√	√		√	√
Vitamin D, calcium, and PTH		√	√	√	√	√	√
24-h urine calcium level			√[a]				√[a]
Vitamin A				√[b]			
Zinc and copper				√[c]			√[c]
Vitamin B1 (thiamine)	In the presence of symptoms or risk factors[d]						
Vitamin E and K and selenium	In the presence of symptoms						

[a]After BPD/DS or in those with a history of renal stones. [b]After RYGB and BPD/DS or in cases of malnutrition. [c]After RYGB and BPD/DS. [d]Especially in the first 6 months, the patient should be carefully monitored for symptoms and risk factors.

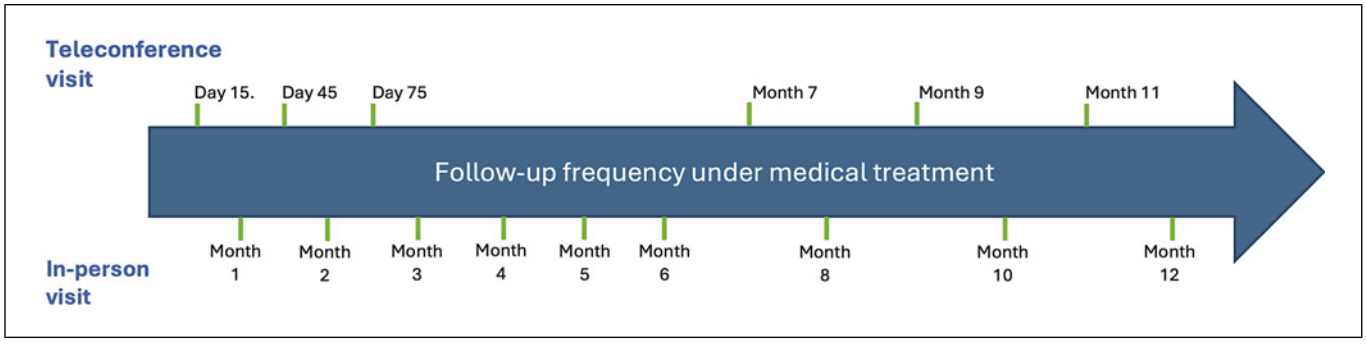

Fig. 2. Frequency of follow-up visits for patients under medical treatment.

Number, Frequency, and Content of Follow-Up Visits for Obesity Patients Undergoing Medical or Surgical Treatment

During follow-up visits for patients undergoing medical treatment for obesity, the side effects and drug tolerance of obesity medications are primarily assessed. If serious side effects are present, the medication is discontinued. If tolerable side effects are noted, dosage adjustments are made based on clinical conditions. Any changes in lifestyle including diet and physical activity are recorded. Positive changes are emphasized, and recommendations are provided for areas that have not progressed. The date of the next visit is scheduled, and the goals to be achieved by that visit are mentioned to the patient. Treatment is continued if a weight loss of >5% is achieved after 3 months of medical treatment. If the weight loss is <5%, the treatment plan is reviewed, and the obesity medication may be discontinued or replaced with another agent. Depending on the patient and the unit's suitability, follow-up visits may be conducted via video conference or phone. However, during the first year, the interval between face-to-face appointments should not be extended beyond 2 months.

In surgically treated patients, wound healing, pain status, adherence to postoperative treatments, and adequacy of physical activity are assessed during the initial post-discharge follow-up visits. In addition, dietitians investigate the nutritional status and whether the patient is receiving enough protein and fluid. Changes in nutrient content and tolerance to food intake are reviewed during the subsequent visits.

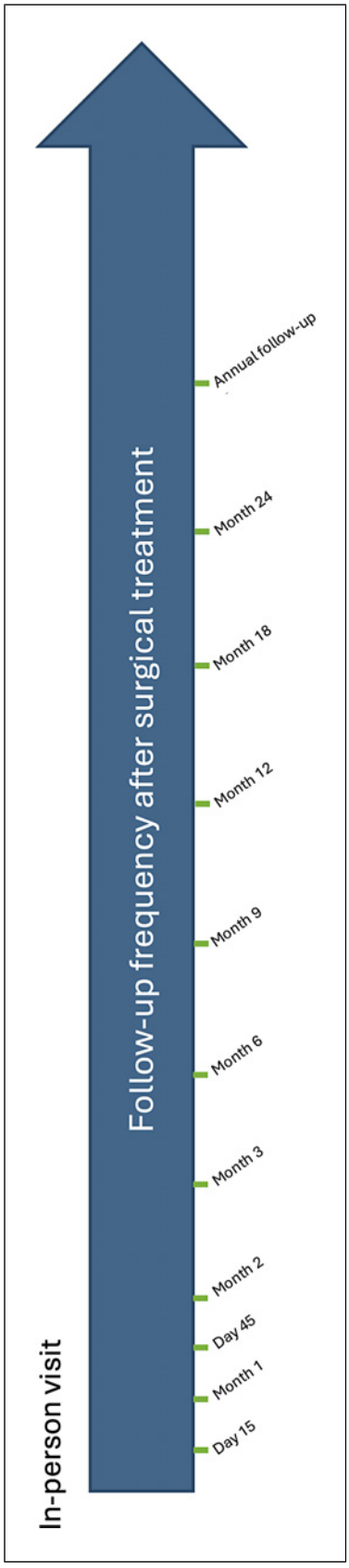

Fig. 3. Frequency of follow-up visits for patients after surgical treatment.

Postsurgical follow-up visits should periodically review the patients' metabolic status and vitamin and mineral levels. The required laboratory tests and their frequencies are presented in Table 8 [50].

In-Person or Phone/Video Conference Follow-Up Visits

- Frequency of visits
  - For patients under medical treatment is shown in Figure 2:
    - Teleconference visits 2nd, 6th, and 10th weeks, and 7th, 9th, and 11th months
    - In-person visits 1st, 2nd, 3rd, 4th, 5th, 6th, 8th, 10th, and 12th months
      - Follow-up every 3 months thereafter
  - After surgical treatment is shown in Figure 3:
    - Teleconference 2nd, 4th, 6th, and 8th weeks
    - In-person 1st, 3rd, 6th, 9th, and 12th months
      - Follow-up every 6 months thereafter
- Visit duration
  - Teleconference 10–15 min
  - In-person 15–20 min
- Healthcare professionals conducting the visits
  - Depending on the treatment and the patient's needs, a doctor, dietitian, psychologist, or exercise specialist can conduct visits.
  - If a digital monitoring program is used, digital data should be reviewed before the visit.
- Parameters to be evaluated and recorded during the interview
  - Side effects of the obesity medications.
  - For patients undergoing surgical treatment, post-discharge pain, and bowel movements.
  - Anthropometric measurements (weight, height, WC, and body fat distribution).
  - Nutritional behavior.
    - Energy intake, macronutrient content, and fluid intake
  - Physical activity level
    - Structured planned and daily targeted aerobic, weight, stretching, and balance exercises
  - Impulse control, problem-solving skills, emotional and social triggers, and the eating environment.
  - Review of medications for other chronic metabolic diseases causing weight gain.
  - Adherence to medications given after bariatric surgery.
  - Review of laboratory parameters (glycemic level, anemia, and vitamin and mineral deficiencies).
  - Goals for the next visit are set, and how to reach these goals is determined and implemented.

Conclusion

This consensus report describes how diagnosis, treatment, and follow-up of people living with obesity can be carried out with absolute and sustainable interdisciplinary cooperation in the light of up-to-date, evidence-based information. The awareness, sincere effort, and collaboration of all health professionals are required to treat this critical disease, which affects a large segment of society and is rapidly increasing in incidence. Indeed, the most effective and accurate method of combating obesity should be to prevent its development. For this purpose, all segments of society, central and local administrators, press and publication organs, and civil society organizations should join hands as soon as possible and take effective and sustainable preventive measures.

Acknowledgments

This consensus report is endorsed by the Executive Boards of the Society of Endocrinology and Metabolism of Türkiye (SEMT), the Turkish Association for the Study of Obesity (TASO), the Turkish Obesity Surgery Society (TOSS), the Turkish Foundation for Bariatric Surgery (TFBS), the Association of Bariatric and Metabolic Surgery (ABMS), and the Association of Metabolic and Bariatric Surgery Dietitians (AMBSD). After publication, the societies will publicize the report from the institutional websites, send it to all relevant associations for obesity treatment, and submit it to the Turkish Ministry of Health to inform the public authority. The report is intended to serve as the basis for revising the current national protocol of the obesity centers of the Turkish Ministry of Health.

Conflict of Interest Statement

Alper Sonmez participated in advisory board meetings held by Novo Nordisk, Novartis, Eli Lilly, and Trispera. Fahri Bayram participated in clinical studies and advisory board meetings conducted by Novo Nordisk, Pfizer, AstraZeneca, and Boehringer and got honorarium from Econix, Sandoz, Eli Lilly, MSD, Medtronic, Trispera, Abbott, Sanovel, Sanofi, and Novartis. Sinem Kiyici engaged in advisory boards and lectures with Novo Nordisk, Trispera Pharma Solutions, Boehringer Ingelheim, AstraZeneca, Abbott, Novartis, and Sanofi and participated in clinical trial performed by Boehringer Ingelheim. Dilek Yazici engaged in advisory boards and lectures with Novo Nordisk, Lilly, Boehringer Ingelheim, and Sanofi. Zehra Yağmur Şahin Alak had congress support from Novo Nordisk, Servier, Science Pharmaceuticals, and Boehringer Ingelheim. Feray Akbaş got congress support from Sanovel, Menarini, and Novo Nordisk. Taner Bayraktaroglu gave lectures with Boehringer Ingelheim, Gen İlaç, Bilim İlaç and got research payment from Accelsiors. Mustafa Cesur participated in advisory board meetings held by Novo Nordisk, Abdi Ibrahim, and Trispera and got an honorarium from Servier and Novo Nordisk. Volkan Yumuk engaged in advisory boards and lectures with Novo Nordisk, Eli Lily, Rhythm, and Regeneron. Other authors declare that they have no conflict of interest.

Funding Sources

Medtronic Türkiye funded the transfer and accommodations of the consensus panelists for the two face-to-face meetings. The funder had no role in the design, data collection, data analysis, or reporting of this report. The SEMT provided meeting room support for the final meeting of the consensus panel in Ankara. This work did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

Conceptualization: A.S., V.D.Y., and F.B. Project administration: A.S., F.B., O.B., V.D.Y., N.Z.E., and A.S. Supervision: A.S., F.B., O.B., V.D.Y., M.C., A.S., and E.H.T. Visualization: A.S., S.K., I.D., and Z.Y.S.A. Writing – original draft: A.S., S.K., I.D., Z.Y.S.A, T.B., M.K.Y., H.C., S.O., N.A., M.T.D., S.Y., F.C., G.Y.K., D.Y., O.S., H.K., and H.A. Writing – review and editing: A.S., F.B., O.B., V.D.Y., M.C., A.S., E.H.T., F.A., C.I., A.C., H.O., F.M.A., and M.T.

References

1 Bray GA, Kim KK, Wilding JPH; World Obesity Federation. Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. Obes Rev. 2017;18(7):715–23. https://doi.org/10.1111/obr.12551

2 Jastreboff AM, Kotz CM, Kahan S, Kelly AS, Heymsfield SB. Obesity as a disease: the obesity society 2018 position statement. Obesity. 2019;27(1):7–9. https://doi.org/10.1002/oby.22378

3 Mehrabi F, Mahani F, Cheraghi L, Kheradmand A, Azizi F, Amiri P. Health-related quality of life in those with persistent or transient obesity phenotypes during two decades: tehran lipid and glucose Study. Obes Facts. 2023;16(3):273–81. https://doi.org/10.1159/000529596

4 Abdelaal M, le Roux CW, Docherty NG. Morbidity and mortality associated with obesity. Ann Transl Med. 2017;5(7):161. https://doi.org/10.21037/atm.2017.03.107

5 Cawley J, Biener A, Meyerhoefer C, Ding Y, Zvenyach T, Smolarz BG, et al. Direct medical costs of obesity in the United States and the most populous states. J Manag Care Spec Pharm. 2021;27(3):354–66. https://doi.org/10.18553/jmcp.2021.20410

6 Gogas Yavuz D, Akhtar O, Low K, Gras A, Gurser B, Yilmaz ES, et al. The economic impact of obesity in Turkey: a micro-costing analysis. Clinicoecon Outcomes Res. 2024;16:123–32. https://doi.org/10.2147/CEOR.S446560

7 McGlynn ND, Khan TA, Wang L, Zhang R, Chiavaroli L, Au-Yeung F, et al. Association of low- and no-calorie sweetened beverages as a replacement for sugar-sweetened beverages with body weight and cardiometabolic risk: a systematic review and meta-analysis. JAMA Netw Open. 2022;5(3):e222092. https://doi.org/10.1001/jamanetworkopen.2022.2092

8 Obita G, Alkhatib A. Effectiveness of lifestyle nutrition and physical activity interventions for childhood obesity and associated co-morbidities among children from minority ethnic groups: a systematic review and meta-analysis. Nutrients. 2023;15(11):2524. https://doi.org/10.3390/nu15112524
9 Grannell A, Fallon F, Al-Najim W, le Roux C. Obesity and responsibility: is it time to re-think agency? Obes Rev. 2021;22(8):e13270. https://doi.org/10.1111/obr.13270
10 Bullen NL, Parmar J, Gilbert J, Clarke M, Cota A, Finlay IG. How effective is the multidisciplinary team approach in bariatric surgery? Obes Surg. 2019;29(10):3232–8. https://doi.org/10.1007/s11695-019-03975-5
11 Wyse C, Case L, Walsh Ó, Shortall C, Jordan N, McCrea L, et al. Evaluating 12 years of implementing a multidisciplinary specialist child and adolescent obesity treatment service: patient-level outcomes. Front Nutr. 2022;9:895091. https://doi.org/10.3389/fnut.2022.895091
12 Greco F, Tarsitano MG, Cosco LF, Quinzi F, Folino K, Spadafora M, et al. The effects of online home-based pilates combined with diet on body composition in women affected by obesity: a preliminary study. Nutrients. 2024;16(6):902. https://doi.org/10.3390/nu16060902
13 Hu C, Sun D, Fang Y, Cen X, Xu Y, Baker JS, et al. Mixed comparison of different exercise interventions on physical functioning in adult patients with morbid obesity following bariatric surgery: a systematic review and network meta-analysis. Front Endocrinol. 2024;15:1465718. https://doi.org/10.3389/fendo.2024.1465718
14 Garvey WT, Mechanick JI, Brett EM, Garber AJ, Hurley DL, Jastreboff AM, et al. American association of clinical endocrinologists and American college of endocrinology comprehensive clinical practice guidelines for medical care of patients with obesity. Endocr Pract. 2016;22(Suppl 3):1–203. https://doi.org/10.4158/EP161365.GL
15 Durrer Schutz D, Busetto L, Dicker D, Farpour-Lambert N, Pryke R, Toplak H, et al. European practical and patient-centred guidelines for adult obesity management in primary care. Obes Facts. 2019;12(1):40–66. https://doi.org/10.1159/000496183
16 Pasquali R, Casanueva F, Haluzik M, van Hulsteijn L, Ledoux S, Monteiro MP, et al. European society of endocrinology clinical practice guideline: endocrine work-up in obesity. Eur J Endocrinol. 2020;182(1):G1–g32. https://doi.org/10.1530/EJE-19-0893
17 Wharton S, Lau DCW, Vallis M, Sharma AM, Biertho L, Campbell-Scherer D, et al. Obesity in adults: a clinical practice guideline. Cmaj. 2020;192(31):E875–E891. https://doi.org/10.1503/cmaj.191707
18 Eisenberg D, Shikora SA, Aarts E, Aminian A, Angrisani L, Cohen RV, et al. 2022 American society for metabolic and bariatric surgery (ASMBS) and international federation for the surgery of obesity and metabolic disorders (IFSO): indications for metabolic and bariatric surgery. Surg Obes Relat Dis. 2022;18(12):1345–56. https://doi.org/10.1016/j.soard.2022.08.013
19 National Institute for Health and Care Excellence: Guidelines. Obesity: identification, assessment and management. London: National Institute for Health and Care Excellence (NICE) Copyright © NICE; 2023.
20 American Diabetes Association Professional Practice Committee. 4. Comprehensive medical evaluation and assessment of comorbidities: standards of care in diabetes-2024. Diabetes Care. 2024;47(Suppl 1):S52–76. https://doi.org/10.2337/dc24-S004
21 Yumuk V, Frühbeck G, Oppert JM, Woodward E, Toplak H. An EASO position statement on multidisciplinary obesity management in adults. Obes Facts. 2014;7(2):96–101. https://doi.org/10.1159/000362191
22 Bernat M, Genser L, Oppert JM. [The place of obesity centres in the treatment of severe obesity]. Soins. 2016;61(811):26–7. https://doi.org/10.1016/j.soin.2016.10.004
23 Schaecher KL. The role of managed care organizations in obesity management. Am J Manag Care. 2016;22(7 Suppl l):s197–208.
24 Tsigos C, Hainer V, Basdevant A, Finer N, Mathus-Vliegen E, Micic D, et al. Criteria for EASO-collaborating centres for obesity management. Obes Facts. 2011;4(4):329–33. https://doi.org/10.1159/000331236
25 Eliot K, Cuff P, Firnhaber G, Kolasa KM. Interprofessional obesity treatment: an exploration of current literature and practice. J Interprofessional Education Pract. 2021;25:100475. https://doi.org/10.1016/j.xjep.2021.100475
26 Soan EJ, Street SJ, Brownie SM, Hills AP. Exercise physiologists: essential players in interdisciplinary teams for noncommunicable chronic disease management. J Multidiscip Healthc. 2014;7:65–8. https://doi.org/10.2147/JMDH.S55620
27 Stults-Kolehmainen MA, Bond DS, Richardson LA, Herring LY, Mulone B, Garber CE, et al. Role of the exercise professional in metabolic and bariatric surgery. medRxiv. 2023:2023.04.20.23288698. https://doi.org/10.1101/2023.04.20.23288698
28 Satman I, Omer B, Tutuncu Y, Kalaca S, Gedik S, Dinccag N, et al. Twelve-year trends in the prevalence and risk factors of diabetes and prediabetes in Turkish adults. Eur J Epidemiol. 2013;28(2):169–80. https://doi.org/10.1007/s10654-013-9771-5
29 Dobbie LJ, Coelho C, Crane J, McGowan B. Clinical evaluation of patients living with obesity. Intern Emerg Med. 2023;18(5):1273–85. https://doi.org/10.1007/s11739-023-03263-2
30 Mallik R, Carpenter J, Zalin A. Assessment of obesity. Clin Med. 2023;23(4):299–303. https://doi.org/10.7861/clinmed.2023-0148
31 Domecq JP, Prutsky G, Leppin A, Sonbol MB, Altayar O, Undavalli C, et al. Clinical review: drugs commonly associated with weight change: a systematic review and meta-analysis. J Clin Endocrinol Metab. 2015;100(2):363–70. https://doi.org/10.1210/jc.2014-3421
32 Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606–13. https://doi.org/10.1046/j.1525-1497.2001.016009606.x
33 Chung F, Yegneswaran B, Liao P, Chung SA, Vairavanathan S, Islam S, et al. STOP questionnaire: a tool to screen patients for obstructive sleep apnea. Anesthesiology. 2008;108(5):812–21. https://doi.org/10.1097/ALN.0b013e31816d83e4
34 Chung F, Subramanyam R, Liao P, Sasaki E, Shapiro C, Sun Y. High STOP-Bang score indicates a high probability of obstructive sleep apnoea. Br J Anaesth. 2012;108(5):768–75. https://doi.org/10.1093/bja/aes022
35 Nuttall FQ. Body mass index: obesity, BMI, and health: a critical review. Nutr Today. 2015;50(3):117–28. https://doi.org/10.1097/NT.0000000000000092
36 Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser. 2000;894:i–xii. 1–253.
37 Ben-Noun LL, Laor A. Relationship between changes in neck circumference and cardiovascular risk factors. Exp Clin Cardiol. 2006;11(1):14–20.
38 Kroll C, Mastroeni S, Czarnobay SA, Ekwaru JP, Veugelers PJ, Mastroeni MF. The accuracy of neck circumference for assessing overweight and obesity: a systematic review and meta-analysis. Ann Hum Biol. 2017;44(8):667–77. https://doi.org/10.1080/03014460.2017.1390153
39 Buchholz AC, Bartok C, Schoeller DA. The validity of bioelectrical impedance models in clinical populations. Nutr Clin Pract. 2004;19(5):433–46. https://doi.org/10.1177/0115426504019005433
40 Ward LC. Bioelectrical impedance analysis for body composition assessment: reflections on accuracy, clinical utility, and standardisation. Eur J Clin Nutr. 2019;73(2):194–9. https://doi.org/10.1038/s41430-018-0335-3
41 Sterling RK, Lissen E, Clumeck N, Sola R, Correa MC, Montaner J, et al. Development of a simple noninvasive index to predict significant fibrosis in patients with HIV/HCV coinfection. Hepatology. 2006;43(6):1317–25. https://doi.org/10.1002/hep.21178
42 Fleseriu M, Auchus R, Bancos I, Ben-Shlomo A, Bertherat J, Biermasz NR, et al. Consensus on diagnosis and management of Cushing's disease: a guideline update. Lancet Diabetes Endocrinol. 2021;9(12):847–75. https://doi.org/10.1016/S2213-8587(21)00235-7

43 Bhasin S, Brito JP, Cunningham GR, Hayes FJ, Hodis HN, Matsumoto AM, et al. Testosterone therapy in men with hypogonadism: an endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2018;103(5):1715–44. https://doi.org/10.1210/jc.2018-00229
44 Sharma AM, Kushner RF. A proposed clinical staging system for obesity. Int J Obes. 2009; 33(3):289–95. https://doi.org/10.1038/ijo.2009.2
45 Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American college of cardiology/American heart association task force on practice guidelines and the obesity society. J Am Coll Cardiol. 2014;63(25 Pt B):2985–3023. https://doi.org/10.1016/j.jacc.2013.11.004
46 Santini F, Busetto L, Cresci B, Sbraccia P. SIO management algorithm for patients with overweight or obesity: consensus statement of the Italian Society for Obesity (SIO). Eat Weight Disord. 2016;21(2):305–7. https://doi.org/10.1007/s40519-016-0279-3
47 ElSayed NA, Aleppo G, Aroda VR, Bannuru RR, Brown FM, Bruemmer D, et al. 8. Obesity and weight management for the prevention and treatment of type 2 diabetes: standards of care in diabetes-2023. Diabetes Care. 2023; 46(Suppl 1):S128–39. https://doi.org/10.2337/dc23-S008
48 T.C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü. Türkiye Beslenme ve Sağlık Araştırması (TBSA) [Turkey Nutrition and Health Survey], 1132. Ankara: T.C. Sağlık Bakanlığı; 2019. ISBN: 978-975-590-722-2.
49 Sonmez A, Yumuk V, Haymana C, Demirci I, Barcin C, Kıyıcı S, et al. Impact of obesity on the metabolic control of type 2 diabetes: results of the Turkish nationwide survey of glycemic and other metabolic parameters of patients with diabetes mellitus (TEMD obesity Study). Obes Facts. 2019;12(2):167–78. https://doi.org/10.1159/000496624
50 Mechanick JI, Apovian C, Brethauer S, Garvey WT, Joffe AM, Kim J, et al. Clinical practice guidelines for the perioperative nutrition, metabolic, and nonsurgical support of patients undergoing bariatric procedures - 2019 update: cosponsored by American association of clinical endocrinologists/American college of endocrinology, the obesity society, American society for metabolic & bariatric surgery, obesity medicine association, and American society of anesthesiologists. Surg Obes Relat Dis. 2020;16(2): 175–247. https://doi.org/10.1016/j.soard.2019.10.025
51 Cornier MA. A review of current guidelines for the treatment of obesity. Am J Manag Care. 2022;28(15 Suppl l):S288–96. https://doi.org/10.37765/ajmc.2022.89292
52 ASMBS Endorsed Procedures and FDA Approved Devices. American cociety for bariatric metabolic surgery; 2024.
53 Lim RB. Bariatric procedures for the management of severe obesity: Descriptions. In: UpToDate, Jones D (Ed), Wolters Kluwer. (Accessed on September 8, 2024.)
54 Theodoridis X, Chourdakis M, Haidich AB, Stamouli EM, Pagkalidou E, Fotiadou I, et al. Treatment of obesity with intragastric injection of botulinum toxin. Is it worth the pinch? An overview of systematic reviews and meta-analysis. Obes Res Clin Pract. 2023; 17(3):184–91. https://doi.org/10.1016/j.orcp.2023.05.009
55 Chow A, Neville A, Kolozsvari N. Smoking in bariatric surgery: a systematic review. Surg Endosc. 2021;35(6):3047–66. https://doi.org/10.1007/s00464-020-07669-3
56 Barrea L, Verde L, Schiavo L, Sarno G, Camajani E, Iannelli A, et al. Very low-calorie ketogenic diet (VLCKD) as pre-operative first-line dietary therapy in patients with obesity who are candidates for bariatric surgery. Nutrients. 2023;15(8):1907. https://doi.org/10.3390/nu15081907
57 Oudman E, Wijnia JW, van Dam M, Biter LU, Postma A. Preventing wernicke encephalopathy after bariatric surgery. Obes Surg. 2018;28(7):2060–8. https://doi.org/10.1007/s11695-018-3262-4
58 Albaugh VL, Williams DB, Aher CV, Spann MD, English WJ. Prevalence of thiamine deficiency is significant in patients undergoing primary bariatric surgery. Surg Obes Relat Dis. 2021;17(4):653–8. https://doi.org/10.1016/j.soard.2020.11.032
59 Ying VW, Kim SH, Khan KJ, Farrokhyar F, D'Souza J, Gmora S, et al. Prophylactic PPI help reduce marginal ulcers after gastric bypass surgery: a systematic review and meta-analysis of cohort studies. Surg Endosc. 2015; 29(5):1018–23. https://doi.org/10.1007/s00464-014-3794-1
60 Parrott J, Frank L, Rabena R, Craggs-Dino L, Isom KA, Greiman L. American society for metabolic and bariatric surgery integrated health nutritional guidelines for the surgical weight loss patient 2016 update: micronutrients. Surg Obes Relat Dis. 2017;13(5): 727–41. https://doi.org/10.1016/j.soard.2016.12.018
61 O'Kane M, Parretti HM, Pinkney J, Welbourn R, Hughes CA, Mok J, et al. British Obesity and Metabolic Surgery Society Guidelines on perioperative and postoperative biochemical monitoring and micronutrient replacement for patients undergoing bariatric surgery-2020 update. Obes Rev. 2020;21(11):e13087. https://doi.org/10.1111/obr.13087
62 Parrott JM, Craggs-Dino L, Faria SL, O'Kane M. The optimal nutritional programme for bariatric and metabolic surgery. Curr Obes Rep. 2020;9(3):326–38. https://doi.org/10.1007/s13679-020-00384-z
63 Fearon NM, Kearns EC, Kennedy CA, Conneely JB, Heneghan HM. The impact of ursodeoxycholic acid on gallstone disease after bariatric surgery: a meta-analysis of randomized control trials. Surg Obes Relat Dis. 2022;18(1):77–84. https://doi.org/10.1016/j.soard.2021.10.004
64 Mulliri A, Menahem B, Alves A, Dupont B. Ursodeoxycholic acid for the prevention of gallstones and subsequent cholecystectomy after bariatric surgery: a meta-analysis of randomized controlled trials. J Gastroenterol. 2022;57(8):529–39. https://doi.org/10.1007/s00535-022-01886-4
65 Bayram F, Sonmez A, Kiyici S, Akbas F, Yetgin MK, Yazici D, et al. Expert opinion on the utility of telemedicine in obesity care: recommendations on a hybrid multidisciplinary integrated care follow-up algorithm. Curr Obes Rep. 2024;13(1):167–82. https://doi.org/10.1007/s13679-023-00541-0