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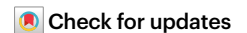
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A new framework for the diagnosis, staging and management of obesity in adults

Luca Busetto, Dror Dicker, Gema Frühbeck, Jason C. G. Halford, Paolo Sbraccia, Volkan Yumuk & Gijs H. Goossens



The European Association for the Study of Obesity presents a new framework for the diagnosis, staging and management of obesity in adults to better align with the concept of obesity as an adiposity-based chronic disease.

Obesity is a multifactorial, chronic, relapsing, non-communicable disease marked by an abnormal and/or excessive accumulation of body fat that presents a risk to health. It is well established that obesity acts as a gateway to a range of other non-communicable and communicable diseases¹⁻³.

Despite this wide recognition of obesity as a chronic disease, the clinical recommendations that guide the diagnosis of obesity and its management have not been aligned sufficiently with the clinical processes normally adopted for other chronic diseases. In many settings, the diagnosis of obesity is still based solely on body mass index (BMI) cut-off values, and does not reflect the role of adipose tissue distribution and function in the severity of the disease¹. Moreover, the indications for using the different therapeutic approaches now available for obesity management remain mostly based on anthropometric measurements, rather than on a more complete clinical evaluation of the individual⁴. This is in sharp contrast with other chronic diseases, for which clear therapeutic indications are described, targets are set, and the choice of the type and intensity of treatment is based on the probability of reaching the treatment target, with adequate and prompt treatment intensification when the target is not reached.

To stimulate the development and implementation of clinical guidelines for obesity that are more aligned with those already in place for other chronic diseases, the European Association for the Study of Obesity (EASO) initiated and conducted a consensus process to propose a new framework for the diagnosis, staging and management of obesity in adults.

Consensus process

We performed a modified Delphi study^{5,6} to identify a set of statements that can aid in the diagnosis, staging and management of obesity according to a framework that is more adherent to the concept of obesity as an adiposity-based chronic disease (ABCD)¹. A steering committee identified by the EASO, consisting of the authors of this paper, discussed and prepared an initial set of statements used for a voting process by a group of experts. Voting was performed on a five-point scale, as follows: (1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; and (5) strongly agree. In each round of voting, experts were also asked to provide comments to explain their voting score, and responses were anonymized. The steering committee

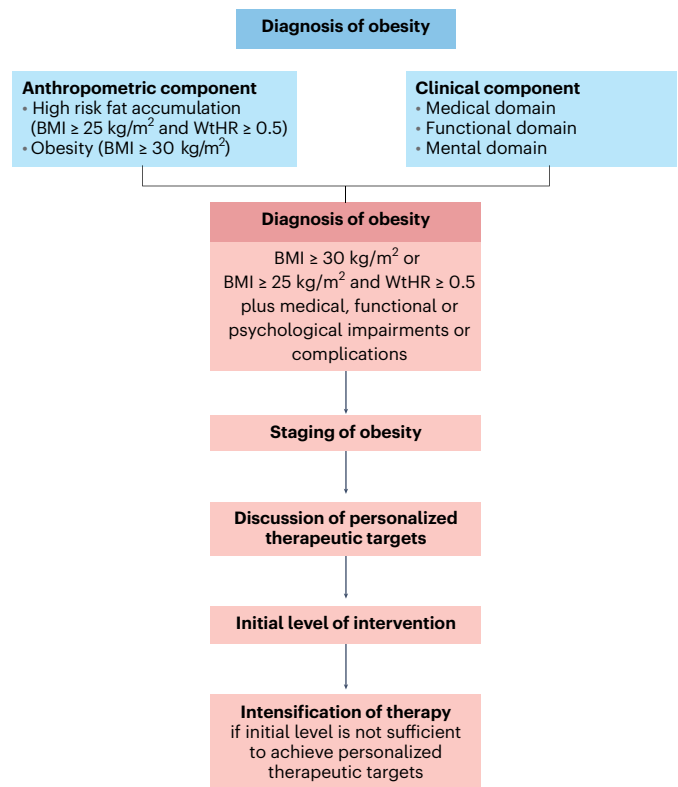


Fig. 1 | A new framework for the diagnosis, staging and management of obesity in adults. This flowchart of the diagnostic and therapeutic pathways results from the statements in Table 1. WtHR, waist-to-height ratio.

evaluated the voting and comments received at each round and generated a modified set of statements for the subsequent round of voting. Consensus was defined as $\geq 75\%$ of expert agreement on a statement (score ≥ 4).

The steering committee retained responsibility for the selection of experts involved in the process. Selection was based on international reputation and known expertise in obesity science and management. In total, 29 experts were contacted, and all agreed to participate in the present study. Most of the experts belong to the endocrinology, nutrition or internal medicine fields (72%), but the group also included five bariatric surgeons, two primary care physicians and one expert on patient advocacy. A standard conflict of interest form was completed by each participant before the start of the Delphi process. This study was performed by the EASO without any external funding, and approval by the ethics committee was not required.

Table 1 | Statements to aid in the diagnosis, staging and management of obesity

Theme	No.	Statement	Consensus (%)
Clinical diagnosis and staging	1	Base the diagnosis of obesity on the recognition of abnormal and/or excessive fat accumulation (anthropometric component) and the analysis of its present and potential effects on health (clinical component).	96%
	2	Measure waist circumference in any person with a BMI < 35 kg/m ² as a marker of visceral fat accumulation and increased cardiometabolic disease risk.	96%
	3	Base the recognition of excessive fat accumulation that may confer an increased risk for progressing to medical, functional or psychological impairments or complications in adults of European descent on the presence of BMI ≥ 25 kg/m ² and a waist-to-height ratio > 0.5.	65%
	4	Base the recognition of obesity in adults of European descent on the presence of BMI ≥ 30 kg/m ² and the absence or presence of any medical, functional or psychological impairments or complications.	70%
	5	Include adults of European descent with BMI ≥ 25 kg/m ² , a waist-to-height ratio > 0.5 and the presence of any medical, functional or psychological impairments or complications in the diagnosis of obesity.	66%
	6	Apply ethnicity-specific cut-offs for BMI.	100%
	7	Consider a determination of body composition and adiposity (percentage body fat) by dual-energy X-ray absorptiometry or, alternatively, bioelectric impedance when BMI and physical examination are ambiguous.	75%
	8	Perform a systematic evaluation of medical, functional and psychological (mental health and eating behavior pathology) status (clinical component) in any person with obesity.	92%
	9	Evaluate the presence of medical complications and metabolic risk factors according to a systematic and cost-effective diagnostic assessment.	96%
	10	Assess the functional status of the person by clinical interview, questionnaires for obesity-related disabilities, or exercise testing.	92%
	11	Perform a diagnostic assessment (muscle strength, performance, body composition) for sarcopenic obesity in case of clinical symptoms or the presence of risk factors hereof.	87%
	12	Ensure that any person with obesity has regular screening for obesity-related cancers.	91%
	13	Assess for depressive symptoms and eating behavior disorders. Consider using psychometric tests for the screening of eating behavior disorders.	87%
	14	Stage obesity as a chronic, relapsing disease, according to the severity of its medical, mental and functional complications.	96%
Pillars of treatment	15	Organize a long-term multidisciplinary management considering obesity as a multifactorial, chronic, relapsing disease.	92%
	16	Remember that the pillars of treatment for obesity management in adults are behavioral modifications (including nutritional therapy, physical activity, stress reduction, sleep improvement), psychological therapy, obesity medications, and metabolic/bariatric (surgical and endoscopic) procedures.	96%
	17	Recommend behavioral modifications for all persons with obesity.	83%
	18	Prescribe, according to official labeling, obesity medications, as an adjunct to behavioral modifications, in patients with a BMI ≥ 30 kg/m ² or a BMI ≥ 27 kg/m ² with an obesity-related disease or complications. Consider the use of obesity medications in adults of European descent with BMI ≥ 25 kg/m ² and a waist-to-height ratio > 0.5 and the presence of medical, functional or psychological impairments or complications.	83%
	19	Consider metabolic/bariatric procedures in individuals with BMI ≥ 40 kg/m ² or with BMI ≥ 35 kg/m ² with an obesity-related disease or complications or with BMI ≥ 30 kg/m ² and poorly controlled type 2 diabetes despite optimal medical therapy.	79%
	20	Provide long-term multidisciplinary follow-up in all patients treated with bariatric surgery.	96%
	21	Include the management of obesity-related complications as part of the comprehensive management of obesity. Consider the presence of obesity and the effects that treatments may have on body weight, body composition or metabolic status in the selection of the drugs used to treat obesity-related complications or non-obesity-related diseases occurring in a person with obesity. Preferably, prescribe drugs not associated with weight gain whenever possible.	100%

Table 1 (continued) | Statements to aid in the diagnosis, staging and management of obesity

Theme	No.	Statement	Consensus (%)
Therapeutic targets	22	Consider that the management and treatment of obesity have wider objectives than weight loss alone and include the prevention, resolution or improvement of obesity-related complications, better quality of life and mental wellbeing, and improvement of physical/social functioning and fitness.	100%
	23	Define personalized therapeutic goals for obesity management in adults, taking into account: (a) Prevention of further weight gain and obesity-related complications. (b) Achievement and maintenance of weight loss sufficient to prevent, resolve or improve obesity-related complications and/or improve quality of life and/or mental wellbeing and/or improve physical/social functioning and fitness.	96%
	24	Set therapeutic goals at the beginning of the treatment, according to the severity and stage of obesity, taking into account available therapeutic options, possible side effects and risks, and patient preferences. Discuss the drivers of obesity and possible barriers to treatment (psychological/mental, mechanical/functional, metabolic, and socioeconomic status-related drivers/barriers) with the patient.	96%
	25	Emphasize long-term, realistic, sustained weight loss to achieve a reduction in health risks and include promotion of weight maintenance and prevention of weight regain. Because obesity is a chronic disease, help persons with obesity understand that lifelong efforts are required to maintain a healthier body weight.	96%
	Initial level of intervention	26	Propose the appropriate initial level of intervention (behavioral modifications alone, psychological therapy, obesity medications, metabolic/bariatric procedures) based on the individual therapeutic goals, the clinical severity of obesity and the previous obesity treatments, rather than on anthropometric parameters only.
27		Discuss and agree with the patient the appropriate initial level of intervention, taking previous therapeutic attempts into account and after careful consideration of all clinically appropriate therapeutic options.	100%
28		Consider intensification of therapy or add additional therapies if the initial level of intervention is not sufficient to achieve the individual therapeutic goals.	96%

The study comprised three Delphi rounds. In the first round, 25 experts (86%) voted and commented on 30 original statements that were prepared by the steering committee. A total of 21 statements (70%) received consensus. The steering committee evaluated voting and comments and generated a second set of 28 statements submitted for a second Delphi round. In the second round, 24 experts (83%) voted and commented on the statements. A total of 24 statements (86%) received consensus. The steering committee discussed the comments received for the four non-consented statements, reconsidered the formulations of these statements, and submitted the four revised statements for the final Delphi round. In the third round, 24 experts (83%) voted and provided final comments related to the four revised statements. One of these four statements (statement 12) reached full consensus, whereas most experts approved the other three revised statements (statements 3–5), with only a few experts providing a score <3 (that is, strongly disagree or disagree). The steering committee performed a final revision and decided to approve a list of 28 statements, covering clinical diagnosis and staging of obesity, pillars of treatment, therapeutic targets, and initial level of intervention. The final list of statements and final percentages of approval by the experts is shown in Table 1. A flowchart of the diagnostic and therapeutic pathways resulting from the statements is presented in Fig. 1.

A chronic progressive disease

The recognition of obesity as a complex chronic non-communicable disease should inform the development of evidence-based guidelines for the diagnosis and management of obesity. We anticipate that, in conjunction with other ongoing initiatives⁷, this Delphi process will contribute to improving obesity management in adults living with obesity.

Based on current clinical evidence, the diagnosis of obesity should not be based solely on the presence of an abnormal and/or excessive fat accumulation (anthropometric component). The diagnosis of

obesity should instead include a careful analysis of the present and potential effects that dysfunctional and/or excessive fat accumulation may have on health (clinical component) (statement 1). This statement aligns with what has been suggested by other recent guidelines on obesity management^{8,9}. Moreover, this statement fully adheres to the concept that obesity should be considered a chronic progressive disease process that may transit from a relatively asymptomatic state to a phase in which abnormal and/or excessive fat accumulation is accompanied by health impairments, and finally to a life-threatening or disabling condition¹⁰.

Abdominal fat accumulation

An important novelty of our framework regards the anthropometric component of the diagnosis. The basis for this change is the recognition that BMI alone is insufficient as a diagnostic criterion, and that body fat distribution has a substantial effect on health. More specifically, the accumulation of abdominal fat is associated with an increased risk of developing cardiometabolic complications and is a stronger determinant of disease development than BMI, even in individuals with a BMI level below the standard cut-off values for obesity diagnosis¹¹. This is reflected by two important statements. First, we make explicit that abdominal (visceral) fat accumulation is an important risk factor for health deterioration, also in people with low BMI and still free of overt clinical manifestations (statement 3). Second, the new framework includes people with lower BMI (≥ 25 – 30 kg/m²) but increased abdominal fat accumulation and the presence of any medical, functional or psychological impairments of complications in the definition of obesity, hence reducing the risk of undertreatment in this particular group of patients in comparison to the current BMI-based definition of obesity (statement 4). The choice of introducing waist-to-height ratio, instead of waist circumference, in the diagnostic process is due to its superiority as a cardiometabolic disease risk marker¹².

Diagnosics and staging

The clinical component of the diagnosis should include a systematic evaluation of medical, functional and psychological (such as mental health and eating behavior pathology) impairments in any person with obesity, as also suggested in other guidelines^{8,9}. A detailed description of the clinical aspects and methodologies that need to be included in this systemic clinical evaluation was beyond the scope of this exercise. For the medical evaluation (statement 9), several documents are available to provide guidance^{4,8}. For the functional and psychological evaluation, examination may be performed using an array of methods, ranging from easy-to-perform tests that are applicable in the primary care setting to more sophisticated tests, which may be reserved for specialized centers (statements 10 and 13). Considering the emerging problem of obesity in older individuals, statement 11 was included to emphasize the importance of performing a diagnostic assessment (muscle strength, performance and body composition) for sarcopenic obesity¹³. Finally, considering the strong association between obesity and several types of cancer, a statement calling for regular screening for obesity-related cancers in any person with obesity was included (statement 12).

Clinical staging processes are frequently used to evaluate and describe an individual's health status and the progression of chronic diseases. Clinical staging usually expresses the severity of a disease in a simplified, condensed and standardized way. This has prognostic implications, and it may guide or mandate therapeutic interventions. In our Delphi process, the experts agreed on the importance of staging obesity as a chronic, relapsing disease, according to the severity of its clinical manifestations and complications (statement 14), as proposed by previous guidelines⁹.

Obesity management

Considering the pillars of treatment of people with obesity (statements 15–21), our recommendations substantially adhere to current available guidelines^{4,8,9}. Behavioral modifications, including nutritional therapy, physical activity, stress reduction and sleep improvement, were agreed as main cornerstones of obesity management, with the possible addition of psychological therapy, obesity medications and metabolic or bariatric (surgical and endoscopic) procedures. For the latter two options, the steering committee discussed the fact that current guidelines are based on clinical evidence derived from clinical trials, in which inclusion criteria were mostly based on anthropometric cut-off values rather than on a complete clinical evaluation^{4,8,9,14}. In current practice, the strict application of these evidence-based criteria precludes the use of obesity medications or metabolic/bariatric procedures in patients with a substantial burden of obesity disease, but low BMI values. Therefore, members of the steering committee proposed, and experts subsequently agreed (79%), that, in particular, the use of obesity medications should be considered in patients with BMI ≥ 25 kg/m² and a waist-to-height ratio > 0.5 and the presence of medical, functional or psychological impairments or complications, independently from current BMI cut-off values (statement 18). This statement may also be seen as a call to pharmacological companies and regulatory authorities to use inclusion criteria that are more adherent to the clinical staging of obesity and less to traditional BMI cut-offs when designing future clinical trials with obesity medications¹⁵.

Full agreement among the experts was reached for the statement that the management of obesity should move beyond weight loss alone, and should include the prevention, resolution or improvement of obesity-related complications, a better quality of life and mental

wellbeing, and improvement of physical and social functioning and fitness (statement 22). This statement will move obesity management closer to the management of other non-communicable chronic diseases, in which the goal is not represented by short-term intermediate outcomes, but by long-term health benefits. Defining long-term personalized therapeutic goals should inform the discussion with the patients from the beginning of the treatment, considering the stage and severity of the disease, the available therapeutic options and possible concomitant side effects and risks, patient preferences, individual drivers of obesity and possible barriers to treatment (statements 23 and 24). Emphasis on the need for a long-term or life-long comprehensive treatment plan rather than short-term body weight reduction is warranted.

The concept of obesity as a chronic disease and the discussion of therapeutic targets should also inform the choice of the initial level of intervention and eventual intensification of therapy (statements 26–28), avoiding the same repetitive and futile cycles of intervention that are not effective enough to achieve patient benefit, and preventing therapeutic inertia¹⁶.

This Delphi process represents the current vision of the EASO on the diagnosis, staging and management of obesity as a complex, relapsing, non-communicable chronic disease in adults. We anticipate that the recommendations outlined in this paper, in conjunction with other ongoing international initiatives⁷, will contribute to improved obesity management strategies that are more consistent with treatment algorithms already applied for other non-communicable chronic diseases. Moreover, this framework may aid scientific advancements and the development of new clinical practice guidelines.

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Published online: 05 July 2024

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List of experts

The Steering Committee identified by EASO for this project, consisting of the authors of this paper, takes full responsibility for the contents of this Comment. The below specialists participated in the voting process of the Delphi methodology, but not in interpretation of the results or writing of the Comment, and agreed to be mentioned here: M. Agarwal, R. Barazzoni, T. Comuzzie, M. De Luca, N. Di Lorenzo, D. Durrer-Schutz, T. Garvey, C. Hughes, L. Kaplan, C. LeRoux, J. Mechanick, N. Montano, Jean-M. Oppert, R. Peterli, K. Pietilainen, G. Prager, X. Ramos-Salas, D. Ryan, M. Rydén, A. Sharma, and E. van Rossum.

Competing interests

L.B. received personal funding from Novo Nordisk, Boehringer Ingelheim, Eli Lilly, Pfizer, Bruno Farmaceutici as a member of advisory boards, and from Rythms Pharmaceuticals and Pronokal as a speaker. D.D. received personal funding from Novo Nordisk, Boehringer Ingelheim, Eli Lilly as a member of advisory boards, and from Novo Nordisk, Boehringer Ingelheim, Eli Lilly as a speaker. G.F. received payment of honoraria from Lilly and Novo Nordisk as a member of advisory boards, and payment of honoraria for lectures as member of the OPEN Spain Initiative. The University of Leeds received funding from Novo Nordisk for J.C.G.H.'s participation in the ACTION-Teens study. P.S. received payment of honoraria and consulting fees from Novo Nordisk, Eli Lilly, Pfizer, Boehringer Ingelheim and Bruno Farmaceutici as a member of advisory boards. V.Y. received personal funding from Novo Nordisk and Eli Lilly as a member of advisory boards and from Novo Nordisk as a speaker. G.H.G. received research funding from the European Foundation for the Study of Diabetes, the Dutch Diabetes Research Foundation and the Dutch Research Council (NWO).