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Diagnosis and Staging of Obesity for Adults in Primary Care: A Contemporary Synthesis of Multinational Guidelines

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ABSTRACT

Introduction: Due to the growing obesity epidemic, primary care providers (PCPs) are expected to play a pivotal role in obesity management. However, modern guidelines may not be adapted to the time and resource constraints of PCPs. This review aims to summarize the most practical recommendations for the diagnosis and staging of obesity in primary care.

Methods: A systematic search identified currently published obesity guidelines from PubMed and OVID between January 2014 and June 2025 from 12 countries or regions in any language. All articles were reviewed by at least two independent reviewers, from which a narrative synthesis was performed.

Results: The database search identified 1925 records, plus 43 from manual search. After screening and full-text review, 62 obesity guidelines were included. Practical recommendations for the diagnosis and staging of obesity in primary care may consist of five steps: (1) implement a proactive and nonstigmatizing approach to patient discussions about obesity, (2) follow a systematic collection of patient background and history leading to an initial assessment of obesity, (3) use a combination of anthropometrics to diagnose obesity, (4) collect biological measurements and vital signs to refine diagnosis and detect complications, and (5) determine obesity staging using established models. For each step, additional assessments may be considered based on clinical judgment.

Conclusions: This systematic search and narrative synthesis review aimed at distilling recommendations for the diagnosis and staging of obesity into an everyday practice reference for primary care. PCPs may consider implementing these recommendations based on their own resources and clinical judgment.

1 | Introduction

By 2050, it is estimated that nearly one in three adults worldwide will have obesity [1], and the global shortage of obesity medicine specialists [2, 3] implies that millions may go without adequate access to specialty care. For example, the American Board of Obesity Medicine (ABOM) reported as few as about 9800 ABOM diplomats across the United States and Canada as of 2024 [4]. As of today, the European Association for the Study of Obesity (EASO) has only accredited a total of 162 centers for obesity management for adults [5]. Internationally, the World Obesity Federation (WOF) has only listed 193 Strategic Centre for Obesity Professional Education (SCOPE) fellows around the world as of 2025 [6], while also reporting 75% of countries may lack healthcare professionals with specialties related to obesity [7].

Given the lack in specialty care providers, to ensure appropriate access to care and avoid delays in treatment, all healthcare providers (HCPs) in primary care (general practitioners, primary

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care doctors, pharmacists, and nurses) will play an increasingly important role in the diagnosis and management of obesity. HCPs will benefit from continued training and resources to enhance understanding of the disease of obesity and provide evidence-based obesity management.

Our understanding of obesity has dramatically evolved over the recent decades and thus our approach to diagnosis and treatment. Current guidelines recommend moving away from a traditional body mass index (BMI)-centric approach in favor of an adiposity-oriented evaluation [8, 9]. Indeed, major contemporary guidelines and commission articles including the 2024 EASO framework [10], the Lancet Commission [8], and the 2025 American Association of Clinical Endocrinology (AACE) consensus on adiposity-based chronic disease (ABCD) [11] converge toward the combination of multiple anthropometric, biological, and clinical measurements to diagnose and stage obesity and assess its impact on patients' health and quality of life. While guidelines on obesity management recommend increasingly comprehensive assessments, these may be operationally and logistically challenging in clinical practice, particularly for a primary care setting. Moreover, current research and clinical practice in the field of obesity remain deeply anchored in the concept of BMI, while guidelines recommend diagnosis should go beyond solely BMI. Therefore, although more comprehensive assessments of obesity should be integrated into modern diagnosis, the worldwide prevalence of obesity requires an approach that can be practical and implementable at scale.

This narrative review aims to take a global perspective on the diagnosis and staging of obesity. Governmental guidelines, consensus documents, and position statements from medical societies and agencies around the world were reviewed to obtain a global overview of contemporary recommendations. From these resources and with input from HCPs, we aimed to provide a resource that distills comprehensive adult obesity guidelines into an everyday practice reference for HCPs managing patients in primary care to help facilitate the diagnosis and staging of obesity in the general population.

2 | Methods

This review has adopted methodological components of a systematic review including systematic searches and appraisal of the literature, predefined eligibility criteria, multireviewer screening as well as visualization of the screening process using a PRISMA flow diagram, which was followed by a narrative synthesis of their recommendations on obesity diagnosis and staging.

The systematic search of existing literature was conducted to identify current guidelines and recommendations from major obesity societies and agencies. The systematic search included recommendations from 12 countries or regions including Brazil, Canada, China, France, Italy, Japan, Kingdom of Saudi Arabia-United Arab Emirates (KSA-UAE), Spain, Germany, United Kingdom (UK), Europe, and the United States of America (USA). Countries were purposively selected to represent diverse geographic regions, healthcare systems, and models of obesity care, while prioritizing jurisdictions with established, evidence-based obesity guidelines, and recognized expertise in obesity management. This approach enabled the identification of common principles and regional variations in obesity diagnosis and staging across a range of clinical and healthcare contexts. English and non–English-written publications were considered. All guidelines were reviewed by qualified native speakers and with the assistance of artificial intelligence (AI)-supported translation tools (Microsoft Azure AI Translator, Version 3.0).

The systematic search was conducted on both Medline (PubMed) and OVID databases. Keyword combinations included region-specific terms, combined with obesity- and guideline-specific keywords, all sought in records' title and abstract content. The country-specific sequences of keyword combinations terms employed during the database search are available in Supplementary Table 1. The database search was restricted to articles published between January 2014 and June 2025 to capture contemporary guidelines. In cases where a body issued several versions of an obesity guideline, the most recent version was considered. Search results were first screened based on their title and abstract content by two reviewers (G.L.C. and H.T.H.). The screening excluded nonguideline articles such as original or research articles, review articles, and clinical trials. Nonobesity and pediatric guidelines were also excluded. Articles retained after screening underwent full-text review. At full-text review stage, uninformative or irrelevant literature was excluded, as well as guidelines on specialized topics such as pregnancy, surgery, or specific conditions as these patients would likely be treated by specialists.

The systematic database search was complemented by a manual search via government and organization websites, reference lists of included studies, consulting content experts in the field, and where relevant, searching for gray literature. The WOF database was utilized to identify governmental guidelines. All manual additions were eligible for full-text review as described above.

Guidelines retained after full-text review were included for the narrative synthesis and underwent data extraction. All manuscripts included were reviewed by at least two reviewers (G.L.C., H.T.H., or a qualified speaker when reviewing non-English guidelines), and any conflicts were resolved through discussion by arbitration of a third reviewer (G.K.D.). Our search focused on recommendations related to obesity diagnosis and staging. All the relevant information was compiled and organized into a data repository that was then used as a resource for developing the narrative synthesis. The repository can be found in the supplementary materials of this manuscript (Supplementary Tables 2–6).

For the purpose of the narrative synthesis and within the scope of providing practical recommendations for everyday primary care practice, the authors defined recommendations on obesity diagnosis as “Primary” or “Secondary”. Primary recommendations are supported by multiple guidelines and can be generalized to all individuals living with obesity; they were deemed of critical importance following expert review. Secondary recommendations may include guidance found in individual guidelines but deemed important supplemental recommendations to include in a primary care provider (PCP) framework based on expert review.

3 | Results

3.1 | Literature Search Results

A total of 1925 records were identified from PubMed/Medline (1736 records) and OVID (189 records) databases (Figure 1). These records were obtained from different searches that were run separately for each major region (Supplementary Table 1). After duplicate removal, 1753 records were screened based on their title and abstract content. Screening excluded mainly nonguideline publications and also pediatric-focused guidelines and nonobesity guidelines. Of the 171 records left for retrieval, 4 of them could not be accessed due to restricted regional access. Among the 167 records that underwent full-text review by two independent reviewers, 137 were excluded. The main reasons for exclusion were the lack of information related to obesity diagnosis or staging, nonguideline publications, or specialized guidelines (e.g., bariatric surgery) that were not aligned with the scope of this manuscript. Ultimately, 30 guidelines from databases were included for review. To supplement our database search, 43 records were manually identified via government or organization websites, searching the reference lists of previously identified guidelines, consulting content experts in the field and searching the WOF database. After full-text review of these, 32 records were included. In total, 62 guidelines from the database and manual searches were included in this review. It must be noted that more guidelines were found via manual methods—mainly via government or organizations websites—than via the structured database search. The main reason is that many guidelines were published as governmental documentation and/or in non-English language and therefore not available on PubMed or OVID databases.

3.2 | Narrative Synthesis of Practical Recommendations on Obesity Diagnosis and Staging

3.2.1 | Proactive and Nonstigmatizing Patient-Centered Communication and Assessment

Reviewed guidelines included general recommendations for the initial approach and how to frame discussions with patients during the diagnosis and staging of obesity. While a diagnosis of obesity is associated with a greater likelihood of a patient having an obesity plan and achieving weight reduction [12], not all patients may feel comfortable or have a desire to regularly discuss obesity. It is therefore crucial for HCPs to engage in considerate and empathic exchanges while addressing patient's needs. HCPs should always strive to address a patient's primary complaint first, even if unrelated to obesity, and then approach the subject of obesity using patient-centered communication strategies. Primary recommendations include the use of people- or person-first language, describing obesity as a complex disease when initiating dialogue with patients, and avoiding assumptions about individuals presenting with obesity as this can perpetuate bias

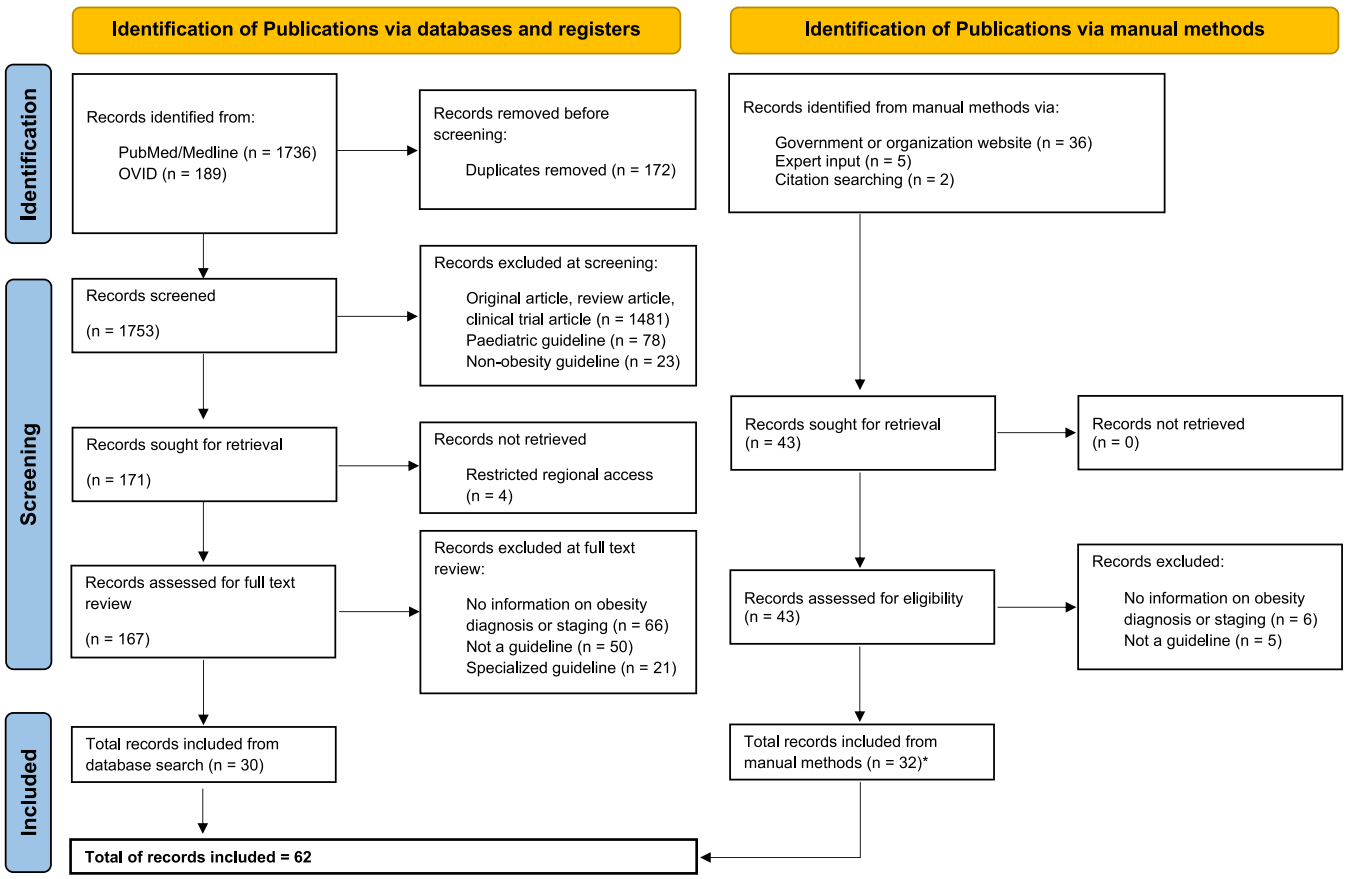

FIGURE 1 | PRISMA chart of the guideline literature search: PRISMA chart modified from Page et al. 2021 [86]. Search details can be found in Supplementary Table 1.*: The rationale for a high proportion of guidelines identified via manual methods is that many guidelines were governmental documentation and/or published in non-English language, therefore not available on PubMed/Medline or OVID databases.

TABLE 1 | Recommendations for proactive and nonstigmatizing patient-centered communication and assessment for the diagnosis and staging of obesity.

Primary recommendations
• When initiating dialogue with the patient and throughout diagnosis, HCPs should use language describing obesity as a chronic disease to reduce bias and stigma:[a] ◦ Communicate obesity as a chronic, relapsing, multifactorial, and treatable disease with biological, environmental, and behavioral origins. Additionally, providers should educate on the potential complications of obesity ◦ Use people-first language and avoid labeling a person as "obese". Preferred nomenclature should be "person with obesity" to help reduce bias and stigma ◦ Use patient-centered communication and methods such as the 5As (Ask, Assess, Assist, Agree and Advise) to determine if a patient is ready to talk about obesity, avoid making assumptions when reviewing a patient profile
Secondary recommendations
• Other recommendations to consider according to clinical judgment:[b] ◦ Comprehensive non-stigmatizing assessment of obesity should be performed yearly or more often if clinically necessary[c], as early as possible in disease course, and should be individualized for each patient ◦ Assessment of obesity should be performed in a private setting without judgment or bias when possible ◦ HCPs should be equipped with adequate tools to diagnose obesity (e.g., lobby chairs, measuring tapes, scales and arm cuffs with appropriate capacity and size)

Note: Primary and secondary recommendations on proactive and nonstigmatizing patient-centered communication and assessment for the diagnosis and staging of obesity. Primary recommendations are supported by multiple guidelines, can be generalized to all individuals living with obesity; and were deemed of critical importance following expert review. Secondary recommendations may include guidance found on individual guidelines but deemed as important supplemental recommendations to include in a PCP framework based on expert review. See detailed recommendations in Supplementary Table 2.
Abbreviation: HCP; healthcare provider.
[a][8–11, 13–29].
[b][10, 15, 17, 19, 21, 23–25, 28, 30–35].
[c][25, 31].

and stigma. Recommendations also include being adequately prepared and equipped to perform regular (yearly) assessments of obesity, respecting a patient's privacy, and performing an individualized diagnosis. These recommendations were used to formulate the guidance listed in Table 1, with a detailed list of guideline-specific recommendations in Supplementary Table 2.

3.2.1.1 | When Discussing Obesity, HCPs Should Aim to Frame Obesity as a Complex Chronic Disease. In 1948, the World Health Organization (WHO) first classified obesity as a disease [36]. Today, the global consensus among guidelines continues to be that obesity is a chronic treatable disease characterized by excess of and/or sickness of adipocytes caused by a multitude of factors such as a patient's biology, environment, and behaviors (Table 1). Guidelines have proposed the mechanisms for the development of obesity that HCPs can use when speaking to and educating patients on the disease. For example, The Lancet Commission categorized the biological mechanisms involved in fat mass regulation as genetic, environmental, psychological, nutritional and metabolic factors [8]. Conversely, the Canadian 5As Taskforce proposed the "4Ms" to detail the mechanisms behind obesity. These include metabolic, mental, mechanical, and monetary factors of obesity [13]. Additionally, the Spanish Society for the Study of Obesity (SEEDO) included in their recommendations several "new elements" of obesity such as chronodisruption, epigenetics, microbiota, endocrine disruptors, feeding pattern, and the obesogenic environment [14]. These recommendations highlight the fact that obesity is not as simple as solely excessive calorie intake but rather a complex pathophysiological state with physical, psychological, and environmental factors and consequences. In fact, the AACE 2025 consensus statement recommended describing obesity as ABCD [11], which was also supported by the EASO [37], and the SEEDO [15]. Finally, framing obesity as a chronic complex disease driven by biology may help reduce a patient's feelings of internalized weight bias and stigma by shifting the focus to obesity's fundamental features: a state of metabolic dysfunction that is driven by many factors beyond an individual's control.

3.2.1.2 | When Speaking to and About an Individual With Obesity, HCPs Should Refrain From Using Language That Labels Patients and Perpetuates Bias and Stigma. People- or person-first language is the gold standard when communicating with, and about patients. This approach, which is supported by multiple global organizations and guidelines [29, 38–41], ensures that patients are not labeled as their condition. Using language such as "obese" to label a patient may imply that their entire identity is defined by their disease and perpetuates the bias and stigma associated with obesity. The EASO has provided a list of terms to avoid when describing a patient, such as "obese" or "morbidly obese" and instead recommends using phrases such as "person or patient with, or living with obesity/severe obesity" [40]. HCPs should aim to implement this guidance beyond patient-provider exchanges and ensure they use people-first language in all their communications to help shift the narrative around obesity from blame to a chronic, multifactorial, and treatable disease.

3.2.1.3 | During the Initial Consultation With a Patient, It Is Important for HCPs to Use Patient-Centered Language and Communication Styles, to Assess a Patient's Willingness Before Discussing Obesity and Diagnosis, and to Avoid Making Any Judgments or Stigmatizing Remarks About a Patient With Obesity. Patient-centered and empathetic communication is key in fostering trust

TABLE 2 | Recommendations on the collection of a patient's background, history, and initial assessment.

Primary recommendations
• HCPs should capture relevant information on patient's past history, including the following:[a] ◦ Ethnicity, sociocultural practices and beliefs ◦ Weight history (e.g., fluctuations, previous attempts and treatments for obesity) ◦ Triggers of weight change (e.g., change in routine or trauma) ◦ Medical history (e.g., chronic disease, allergies, obesity-related complications, full medication list including obesogenic medications; see Box 9) ◦ Family history (e.g., history of obesity and cardiometabolic disorders) • HCPs should collect relevant information on a patient's background based on clinical judgment, such as the following:[b] ◦ Eating habits, hydration status ◦ Physical activity ◦ Social determinants of health: economic conditions, home and work environment, occupation type (e.g., sedentary or manual labor), education level ◦ Psychosocial stressors ◦ Sleeping habits ◦ Sexual health ◦ Social habits (e.g., smoking, alcohol, caffeine use) • Based on clinical suspicion, HCPs should use collected information on background and history to determine primary and secondary obesity, including genetic forms of obesity (` 1 and 2)[c]
Secondary recommendations
• If relevant, HCPs should perform a quality of life and functional assessment of the patient using appropriate tests such as the following:[d] ◦ Quality of life and autonomy in daily tasks ◦ Physical fitness, exercise capacity and functional status ◦ Frailty and sarcopenia[e], particularly in those above 65 years of age • If relevant, HCPs should perform a psychological assessment of the patient using appropriate tests evaluating:[f] ◦ Eating disorders (e.g., binge eating, bulimia, night eating syndrome, self-induced purging) ◦ Psychological and psychiatric disorders (e.g., stress, anxiety, depression, psychological distress, personality and mood disorders, self-harm and suicidal behaviors) ◦ Patient's perception of body image and obesity-related stigma, expectations and motivation for weight loss

Abbreviations: HCP, healthcare provider; SARC-F, strength, assistance with walking, rise from a chair, climbing stairs, and falls.
[a][8, 9, 11, 15–17, 21, 23–27, 30, 31, 33, 45–47, 49–57].
[b][9, 11, 15–17, 19, 21, 23–27, 30, 31, 33, 34, 45–47, 49–51, 55–60].
[c][8, 11, 16, 22, 26, 31, 45, 48, 49, 51, 55, 61, 62].
[d][8, 10, 11, 14–16, 20, 21, 23–27, 29, 34, 45–47, 51, 52, 57, 59–61, 63–66].
[e]Assessments such as SARC-F, Hand grip test, Chair-stand test (see Supplementary Table 3.2).
[f][8–11, 13–17, 21–28, 30, 31, 33, 34, 41, 45–51, 53, 55, 57–59, 61, 64, 67].

and building relationships between HCPs and patients throughout the obesity diagnosis and staging process. In the primary care setting, patients may present to the clinic for a multitude of reasons. Before beginning to discuss a patient's weight, it is important to understand their willingness with questions such as "How do you feel about your weight?" or "Can we talk about your weight today?" [35]. Due to the bias and stigma surrounding obesity, many patients may feel shame and even anger when discussing their weight or being asked to discuss it [35]. In fact, in a study by Puhl RM et al., up to 67% of patients reported doctors as a source of weight stigma, constituting the third highest group after family members and classmates [42]. Research also suggests that there is still a high prevalence of weight bias among HCPs [43]. It is important HCPs recognize that internalized weight bias in people living with obesity can affect behavioral and health outcomes [41]. In fact, evidence suggests that internalized weight bias may be associated with the maintenance of excess weight, therefore potentially contributing to disease progression in a self-perpetuating cycle [44]. Therefore, HCPs should evaluate their own attitudes and beliefs regarding obesity and how these may influence care delivery.

Communication tools that may promote judgment-free and empathetic patient–HCP interactions include, for instance, the use of the 5As (Ask, Assess, Assist, Agree, and Advise; Table 1) to involve patients in their disease journey [13]. In their "Kickstart, Assess, Evaluate, Refer" (KAER) toolkit, the Gerontological Society of America (GSA) added a 6th A, "Arrange", to highlight the need for scheduling and maintaining follow-up sessions with patients [29]. Other methods were recommended, such as the "OARS" approach: "Ask Open-ended questions to evoke change and provide Affirmations, Reflections, and Summaries", detailed by the American Veterans Affairs—Department of Defense (VA-DOD) guideline [22].

There are additional recommendations that may be applicable depending on the individual patient and available practice resources. The first is that obesity diagnosis should occur as early as possible, with a regular re-assessment, and ideally, with an

individualized approach (Table 1). While several guidelines recommended a "regular" assessment of obesity, most did not provide a specific frequency. In their 2025 consensus document, the international Obesity Working Group (OWG) recommended assessing obesity-related parameters either biannually or annually [25]; however, in the primary care setting, annual assessment may be the most practical. Defining a clear diagnosis follow-up frequency is essential to ensure patients get the opportunity to provide updated health information. Additionally, individualized diagnosis was recommended to ensure HCPs adapt their assessment to the patient's individual characteristics.

Next, if resources are available, it is recommended to construct a practice environment considering individuals with obesity so all patients feel they are in a welcoming and safe space. This means practicing and communicating without bias and stigma but also having a clinic layout and equipment that is suited for patients with obesity [35]. For example, lobby chairs, scales, and blood pressure cuffs of appropriate sizes for individuals of all different body types should be used (Table 1). Of course, not every clinic may be able to order extra equipment, but when possible, this can help people with obesity feel more comfortable, safe, and reduce any difficult situations if the standard size equipment is unable to meet their needs. Equipment and its location should also aim to maximize patients' privacy during diagnosis; for instance, practitioners should avoid weighing people in a public area of the clinic.

Finally, as HCPs initiate a conversation about obesity with the patient, it is important to consider that the diagnosis should be comprehensive. It should focus not only on weight but also on the location and distribution of adipose tissue, the presence of obesity-related complications, as well as patient's functional state, psychological health, and social determinants of health. For instance, The Lancet commission stated that the diagnosis of obesity requires confirmation of obesity via anthropometric or body composition, along with evidence of organ dysfunction and/or limitations in day-to-day activities [8]. Due to the necessity of a comprehensive assessment, primary care HCPs are in an incredibly advantageous situation due to the longitudinal relationships they form with patients. By following a patient over their health journey for prolonged periods of time, much of the necessary information for a comprehensive diagnosis of obesity will already have been discussed by the patient and HCP at prior visits. Additionally, a comprehensive diagnosis aligns with the above-described definitions of obesity as a chronic and complex disease. The main elements of obesity diagnosis are described in the next sections of this manuscript.

3.2.2 | Collection of Patient Background, History, and Initial Assessment

A key component to the diagnosis of obesity is the collection of information pertaining to a patient's medical history and information related to their background and activities of daily living. This step allows HCPs to better understand disease etiology and potential contributing factors. Primary recommendations include the collection of information on the patient's history and background, and the identification of primary or secondary causes of obesity (Table 2). If relevant, HCPs may conduct further investigations including assessing patients' quality of life, autonomy, and functional state, as well as performing a psychological assessment. Detailed guideline-specific recommendations can be found in Supplementary Table 3.

When considering specific data to collect on a patient's background, nutrition and physical activity habits may be viewed as the most clinically relevant information, but a variety of additional elements including patient socioeconomic status, work environment, substance use, stress levels, sleeping habits, as well as mindset and motivation for change should also be considered (Table 2). During patient's background collection, it is important to consider that social determinants of health such as economic conditions, occupation type, exposure to marketing of unhealthy foods, obesogenic chemicals, access to healthcare, affordable nutrient dense foods, and facilitators of physical activity such as public parks are all contextual factors that modulate the risk and expression of obesity across the lifespan and generations [68].

Patient history and background should be directed to identify underlying etiology or drivers for obesity. At this stage, HCPs should determine if obesity is considered primary, secondary, or genetic (Table 2 and Boxes 1 and 2). Certain forms of obesity such as syndromic or endocrine origin may require specialist input and further analyses. For instance, the European Society of Endocrinology (ESE) recommends testing systematically for thyroid function in all patients with obesity [69]. In fact, TSH is included here as a core laboratory test for obesity diagnosis (Table 4). Other hormonal tests may include testosterone for hypogonadism, androgens for polycystic ovary syndrome (PCOS), or cortisol levels for Cushing's syndrome [69] and should be performed based on clinical judgment. It must be noted that the categorization of primary and secondary causes of obesity varied across guidelines. For instance the ESE—The Obesity Society (ESE-TOS) 2015 guideline defined together genetic causes, monogenic disorders, and syndromes as primary causes of obesity [31], while, according to The Lancet commission, primary obesity results from unknown causes and is the most prevalent form [8]. Additionally in several occurrences, secondary and genetic causes of obesity were referred to as "rare causes" [24, 33, 47], which may indicate a lack of standardization in nomenclature across societies, potentially resulting in unclear diagnosis guidance.

To facilitate the collection of information on a patient's background and history for obesity diagnosis, guidelines recommended a variety of tools (Supplementary Table 3.2). These tools can help clinicians gather information on a patient's quality of life, functional status, and psychological state which are intertwined with a patient's history and background. In addition to formal tools, there are recommendations such as from the OWG 2025 consensus statement that patient background and history information could be patient-reported via the use of questionnaires [25]. Such questionnaires sent ahead of consultation could significantly reduce collection time, allowing HCPs and patients to dedicate more time to discussion and focus on clinical parameters and tests. Asking about eating patterns in questionnaires may be a sensitive topic for patients with internalized weight bias and stigma but is important information for clinicians to collect. Some questions to help evaluate a patient's relationship with food may include "What and how do you eat?",

BOX 1 | Examples of obesogenic medications.

Antidepressants (e.g., paroxetine, citalopram), antiepileptics (e.g., valproic acid, carbamazepine), antihistamines (e.g., diphenhydramine, cetirizine, loratadine, levocetirizine, fexofenadine), antihypertensives (β and α-adrenergic blockers, e.g. propranolol, doxazosin), antiparkinsons (e.g., piribedil, levodopa), antipsychotics (e.g., clozapine, olanzapine), corticosteroids (e.g., prednisone, dexamethasone, budesonide), glucose lowering medications (e.g., insulin, glitazones and sulfamids), hormonal treatment and contraceptives (e.g., progestogen, etonogestrel, medroxyprogesterone), mood-stabilizers (e.g., lithium), over the counter medications (e.g., diphenhydramine) [13, 24, 45–47].

BOX 2 | Primary and secondary forms of obesity.

- Primary obesity is the most common form of obesity, mainly attributed to a combination of factors without an underlying medical condition being the primary driver [8]
- Secondary forms of obesity may be: [8, 31, 48]
- Neurological (e.g., brain injury or tumor, consequences of cranial irradiation, hypothalamic obesity)
- Endocrine and hormonal
- Drug-Induced (see Box 9 for examples of obesogenic medications)
- Psychological

"With whom do you eat?", *and* "Where do you eat?" [17]. These questions can be asked along with requesting from the patient a sample day of their typical dietary habits. Supplementary Table 3.2 lists more tests and questionnaires that can help gather information on quality of life, autonomy, functional state, and psychological health.

However, in an era where HCPs have on average 10 min [73] per appointment with their patients, it is not feasible to collect or discuss all of this information at once. Therefore, HCPs should work to incorporate gathering this information using pre-visit questionnaires or other technological tools. With the information captured, at each visit, providers can have a discussion with the patient to determine one or two areas to focus on. This will provide the patient with the opportunity to discuss topics they are most interested or concerned about as well as encourage routine follow-up visits and set the tone for the next appointment. Finally, to provide the best possible care, HCPs should aim to synchronize goals and messages across a patient's entire healthcare team ensuring continuity of care across all appointments.

3.2.3 | Evaluation of Anthropometrics and Body Composition

Anthropometric assessment is a central component of obesity assessment as most guidelines define the diagnosis using anthropometric-derived thresholds. Table 3 describes the primary recommendations on anthropometric and body composition assessments during obesity diagnosis. Specific guideline recommendations can be found in Supplementary Table 4.

3.2.3.1 | Use a Combination of Anthropometric Measures When Formulating the Diagnosis of Obesity. BMI and WC are the two main anthropometrics recommended by guidelines for the diagnosis of obesity (Table 3). Both measures are easy to calculate, inexpensive, fast, and relatively easy to interpret and explain to patients. However, both have important caveats, supporting that clinicians should not rely on one sole anthropometric to make a diagnosis of obesity, and in some clinical scenarios, additional body composition measurements may also be considered if available.

3.2.3.1.1 | BMI in Primary Care. BMI is likely the measure almost all clinicians are familiar with. It is quick and easy to calculate, low cost, and has a high specificity for excess adiposity [81]. However, it possesses several limitations including the fact that it is not a "one size fits all" measure or that it does not indicate the location and type of excess adiposity (e.g., subcutaneous, visceral, and ectopic fat) and cannot distinguish what is driving the elevated weight (e.g., fat versus muscle tissue) [81]. Therefore, BMI should be interpreted with caution and be based on individual patient factors including gender and ethnicity (Box 3) but also age and athletic status. For these reasons, several guidelines explicitly stated that BMI possess limitations and that it should be used in combination with other anthropometric measures, in particular WC, to inform on body fat distribution in the diagnosis of obesity [8, 34, 52, 64].

3.2.3.1.2 | WC and WHtR in Primary Care. WC was recommended as a common complementary anthropometric measure to BMI, as an indirect measure of visceral or abdominal fat and a proxy for cardiometabolic risk assessment (Table 3). However, WC specificity may decrease in patients with high adiposity and several guidelines stated that WC is less informative when BMI is above 35 kg/m^2 [14, 22, 60]. Moreover, as stated by the Obesity Canada, WC is sensitive to abdominal distension such as during pregnancy, or due to edema [23]. Like BMI, there are ethnicity-adjusted thresholds for WC (Box 3) that should be taken into consideration when examining individual patients. A key limitation of WC is there is no universal standard on how to measure it. While most guidelines as well as the WHO [76] recommended the "midline level" halfway between rib's inferior margin and iliac crest, other countries or regions described different measurement sites (Figure 2). Therefore, this review focuses its recommendations on the midline site, but HCPs may choose the site they feel most comfortable with. In addition, a lack of broadly available guidance remains on strategies for addressing common challenges of obtaining accurate WC measures in a patient-centric manner (e.g., clothing restrictions and how tight the measuring tape should be wrapped) [17, 26, 48]. HCPs may require training for WC measurement on how to place and wrap the tape measure to ensure consistency, while respecting patient's privacy. We outlined a simplified WC measurement protocol for HCPs in Box 4.

From BMI and WC, the waist-to-height ratio (WHtR) can be calculated. WHtR was frequently recommended as a reliable diagnostic tool for obesity and cardiometabolic risk, and the reviewed

TABLE 3 | Recommendations on anthropometric and body composition assessments for the diagnosis of obesity.

Primary recommendations

- The diagnosis of obesity should include a combination of gender- and ethnicity-adjusted anthropometric parameters such as the following:[a]
  - Body mass index (BMI), calculated from patient's height and body weight, is a tool that is easy and convenient but does not inform on body fat distribution (see diagnosis thresholds in Box 3).
  - Waist circumference (WC), measured at the mid-point between the rib's inferior margin and the iliac crest in a horizontal plane, is a tool that can be considered as a proxy for abdominal fat and cardiometabolic risk (see diagnosis thresholds in Box 3 and simplified protocol in Box 4).
    - From WC and height, the waist-to-height ratio (WHtR) may be calculated, especially if automatically integrated in an electronic health record system. A WHtR ≥ 0.5 indicates excess abdominal adiposity associated with higher cardiometabolic risk.

Secondary recommendations

- Considerations when interpreting anthropometric parameters:[b]
  - Use caution when interpreting BMI in athletes or highly muscular adults due to potential risk of overdiagnosis of obesity, or in elderly patients due to potential risk of underdiagnosis of obesity attributed in both cases to body composition.
  - Different measurement sites may exist for WC measurement. HCPs may choose the method they feel most comfortable with while considering the variability between different sites (see Figure 2).
  - Use adapted methods and equipment for patients unable to stand or with disabilities (see Box 5).
- Other available anthropometrics:[c]
  - WHR ≥ 0.9 in males and ≥ 0.85 in females indicates obesity
  - NC ≥ 43 cm (17 in.) in males or ≥ 41 cm (16 in.) in females indicates higher risk of OSA
- If available and resources allow, measure a patient's body composition to evaluate body fat mass, fat distribution, and lean mass:[d]
  - Body fat ≥25% in males or ≥30% to 35% in females may indicate obesity (BIA or DEXA).
  - Visceral fat area ≥100 cm^2 may indicate obesity (CT scan or MRI).
- When body composition analysis tools are not available, consider using anthropometric-based indexes to refine obesity diagnosis (see Box 6)[e].

Note: Primary and secondary recommendations on anthropometric and body composition assessments. Primary recommendations are supported by multiple guidelines, can be generalized to all individuals living with obesity, and were deemed of critical importance following expert review. Secondary recommendations may include guidance found on individual guidelines but deemed as important supplemental recommendations to include in a PCP framework based on expert review. See detailed recommendations in Supplementary Table 4.

Abbreviations: BIA, bioelectrical impedance analysis; BMI, body mass index; CT, computed tomography; DEXA, dual-energy X-ray absorptiometry; MRI, magnetic resonance imaging; NC, neck circumference; OSA, obstructive sleep apnea; WC, waist circumference; WHR, waist-hip ratio; WHtR, waist-to-height ratio.

[a][8, 11, 25, 26, 34, 52, 59, 64].

[b][8, 9, 11, 14, 15, 17, 20–22, 24, 26, 27, 30, 33, 47, 48, 52, 54, 60, 61, 78].

[c][8, 17, 20, 22, 23, 27, 45, 49, 51, 52, 57, 64, 67, 70, 71, 75, 80].

[d][8, 10, 11, 14–16, 20, 22, 26, 27, 29, 45, 48, 49, 51, 52, 55, 60, 61, 64, 67, 70–72, 79].

[e][26, 49, 57, 60, 75].

BOX 3 | Genetic forms of obesity.

- Genetic forms of obesity include the following: [8, 31, 49]
  - Monogenic disorders (e.g., Melanocortin-4 receptor mutation, Leptin or Pro-opiomelanocortin deficiency)
  - Syndromic obesity (e.g., Prader-Willi, Bardet-Biedl, Cohen, Alström, Froehlich)

guidelines aligned on a WHtR obesity diagnosis threshold of 0.5 regardless of ethnicity and gender (Table 3). Overall, the combination of BMI, WC, and WHtR appears to constitute a reliable assessment tool that would reflect patients' individual characteristics. Several societies including The Lancet commission, the EASO, or the AACE have recommended combining these tools [8, 10, 11].

3.2.3.1.3 | Additional Anthropometrics. Other anthropometrics proposed by guidelines include the waist-to-hip ratio (WHR) and neck circumference (NC). A WHR ratio ≥ 0.9 in males and ≥ 0.85 in females indicates obesity (Table 3). Nonetheless, the WHR would imply an additional hip circumference measurement and therefore be one extra step to take in a time-constrained environment. The measurement of NC may inform on the risk of obstructive sleep apnea (OSA, NC ≥ 43 cm or 17 in. in males, NC ≥ 41 cm or 16 in. in females) [51]. It must be noted that while skinfold thickness was mentioned by several guidelines, it was generally described as an unreliable tool [20, 52]. Finally, several bodies issued recommendations on diagnosing obesity in patients with physical disabilities, suggesting the use of adapted equipment and anthropometrics such as the Chumlea formula that is based on knee height and patient's age and gender (Box 5).

3.2.3.1.4 | Body Composition Analysis in Primary Care. Body composition analysis may complement anthropometric measurements in obesity diagnosis with precise fat mass and lean mass quantitation and localization (Table 3). However, while multiple guidelines recommended

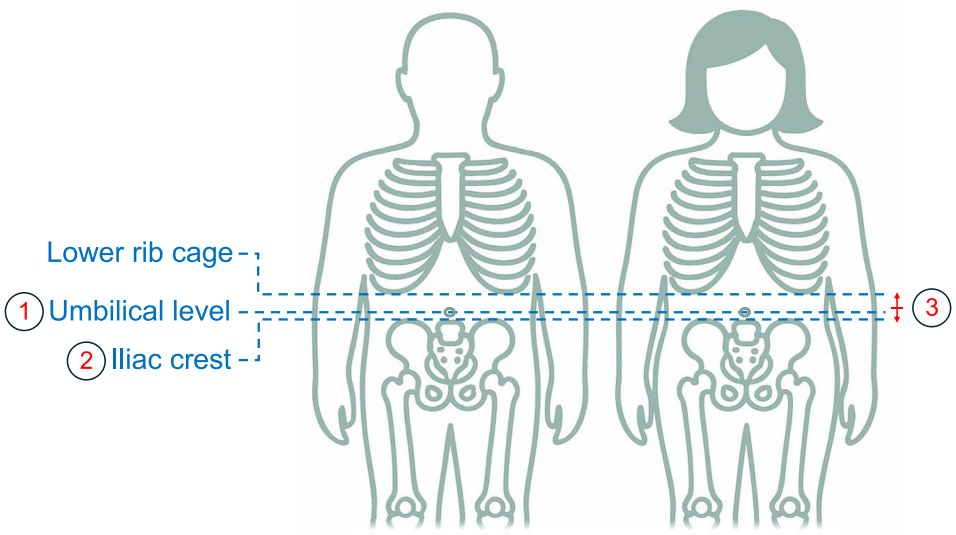

FIGURE 2 | Waist circumference measurement sites: Measurement sites for waist circumference measurements. The reviewed guidelines described different sites for measuring WC during obesity diagnosis: Site 1 (umbilical level) was recommended by the Japanese agency JASSO [48]; Site 2 (Iliac crest) was recommended by American agencies NHLBI [46] and VA-DOD [22], and the Spanish agency SEEDO (2016 position statement) [14]; Site 3 (Midline level, half way between rib's inferior margin and iliac crest) was recommended in guidelines issued by Brazilian (ABESO and Ministério da Saúde) [30, 52], Canadian (Obesity Canada-CABPS) [23], European (EASO, DESCARTES-ERA) [17, 75], Italian [64], Spanish (SEEDO, 2024 guideline) [15], and British (NICE) [21] agencies. Site 3 was also recommended by the WHO [76]. The authoring team acknowledges the use of AI in the development of Figure 2 (Microsoft 365 Copilot, Version number: bizchat.20251023.62.2).

the implementation of body composition analysis tools, their applicability was not consensual mainly due to their cost and availability or to a lack of standardized diagnosis threshold. Moreover, not all body composition analysis tools were equally supported. For instance, the Brazilian obesity society stated that while bioelectrical impedance analysis (BIA) was an efficient diagnosis tool, other techniques such as dual-energy X-ray absorptiometry (DEXA), magnetic resonance imaging (MRI), echography, or computed tomography (CT) had not demonstrated utility in clinical practice [52]. Conversely, the National Institute for Health and Care Excellence (NICE) recommended against the use of BIA as a substitute for BMI to measure adiposity [21]. On the other hand, several guidelines advocated for the use of body composition analysis in routine obesity diagnosis. For instance, the Italian Health Ministry recommended the use of BIA as a quick non-invasive method to estimate body composition with low accuracy and that DEXA should be considered as the reference method with the highest accuracy [20].

Beyond cost and availability considerations, it must be noted that body composition analysis tools lack validated thresholds for obesity diagnosis [15, 53, 61, 71]. Nonetheless, several guidelines proposed cutoff values with a body fat of $\geq 25\%$ in males or $\geq 30\%$ to 35% in females detected with BIA or DEXA (may increase with age) [15, 20, 22, 45] or a visceral fat area $\geq 100\,cm^2$ with CT scan [48]; however, these values require further validation and consensual adoption. Finally, the use of ultrasound-based devices is an emerging technique that primary care HCPs may use for body composition analysis but is not currently common practice. Cutoff points have been proposed but still require validation for obesity diagnosis [26].

Therefore, without clear consensus, and in scenarios where body composition analysis tools are not available, HCPs should consider what is feasible for their practice and patient population. BMI, WC, and WHtR may be the preferred options in primary care; however, other anthropometric-based indexes may serve as reliable indicators of patient adiposity and cardiometabolic risk as well (Box 6). Lower cost alternatives such as the smartphone camera-based "visual body composition tool" (Box 6) may also help provide enhanced diagnostic insight related to body composition while preserving patients' privacy. Although this new technology is already available via smartphone applications, it may require further validation [29, 79].

3.2.4 | Biological Measurements, Vital Signs, and Assessment of Obesity-Related Complications

A component of the holistic approach to the diagnosis and staging of obesity is measuring basic vital signs, ordering a variety of clinically relevant and laboratory measured biomarkers, and the assessment of obesity-related complications. These steps can help patients and HCPs understand the metabolic and end-organ consequences of obesity. Primary recommendations are listed in Table 4, and detailed recommendations from reviewed guidelines can be found in Supplementary Table 5.

3.2.4.1 | When Diagnosing Obesity HCPs Should Aim to Collect Metabolic Parameters. Guidelines across the globe recommend performing a wide variety of laboratory assessments to assist in the diagnosis and staging of obesity. The most commonly included measurements were related to glycemia, lipidemia, blood pressure, liver enzymes, kidney function, blood

BOX 4 | Gender- and ethnicity-specific BMI and WC thresholds.

Region/ethnicity	Body mass index (BMI)	Waist circumference (WC)
Caucasian, Europid, North-American [11, 15, 20, 23, 24, 46, 53]	• Overweight ≥ 25 kg/m^2 • Obesity ≥ 30 kg/m^2	Higher cardiometabolic risk • ≥ 94 cm in males (37.0 in) • ≥ 80 cm in females (31.5 in) Significant cardiometabolic risk • ≥ 102 cm in males (40.2 in) • ≥ 88 cm in females (34.6 in)
Latin ethnicity, Central and South America [23, 30]	• Overweight ≥ 25 kg/m^2 • Obesity ≥ 30 kg/m^2	High CV risk • ≥ 88 cm in males (34.6 in) • ≥ 83 cm in females (32.7 in) Significantly high CV risk • ≥ 94 cm in males (37.0 in) • ≥ 90 cm in females (35.4 in)
Canadian Aboriginal [23]	Not reported	Higher cardiometabolic risk • ≥ 94 cm in males (37.0 in) • ≥ 80 cm in females (31.5 in)
African American [23]	Not reported	Higher cardiometabolic risk • ≥ 80 cm in males (31.5 in) • ≥ 90 cm in females (35.4 in) Significant cardiometabolic risk • ≥ 95 cm in males (37.4 in) • ≥ 99 cm in females (39.0 in)
African [23]	• Overweight ≥ 25 kg/m^2 • Obesity ≥ 30 kg/m^2	Higher cardiometabolic risk • ≥ 76.5 cm in males (30.1 in) • ≥ 71.5 cm in females (28.1 in) Significant cardiometabolic risk • ≥ 80.5 cm in males (31.7 in) • ≥ 81.5 cm in females (32.1 in)
Middle-Eastern, or Sub-Saharan African [16, 23, 53, 61]	• Overweight ≥ 25 kg/m^2 • Obesity ≥ 30 kg/m^2	Higher cardiometabolic risk • ≥ 94 cm in males (37 in) • ≥ 80 cm in females (31.5 in)
South Asian, Chinese, other Asian, Middle-Eastern, Black African or African–Caribbean [21]	• Overweight ≥ 23 kg/m^2 • Obesity ≥ 27.5 kg/m^2	Not reported
Asian, South Asian [30, 71]	• Overweight ≥ 23 kg/m^2 • Obesity ≥ 25 kg/m^2	Higher cardiometabolic risk • ≥ 85 cm in males (33.5 in) • ≥ 80 cm in females (31.5 in)
East, South, and Southeast Asian [52, 53]	• Overweight ≥ 23 kg/m^2 • Obesity ≥ 27.5 kg/m^2	Obesity • ≥ 85 cm in males (33.5 in) • ≥ 74 cm in females (29.1 in)
Malaysia, Singapore [8]	• Overweight: ≥ 23 kg/m^2 • Obesity ≥ 27.5 kg/m^2	Obesity • ≥ 90 cm in males (35.4 in) • ≥ 80 cm in females (31.5 in)
Bangladesh, Hong Kong, India, Philippines, Sri Lanka, Thailand, Vietnam [8]	• Overweight ≥ 23 kg/m^2 • Obesity ≥ 25 kg/m^2	Obesity • ≥ 90 cm in males (35.4 in) • ≥ 80 cm in females (31.5 in)

BOX 4 | (Continued)

Region/ethnicity	Body mass index (BMI)	Waist circumference (WC)
South Korea, Korean [8, 23]	• Overweight ≥ 23 kg/m^2 • Obesity ≥ 25 kg/m^2	Higher cardiometabolic risk • ≥ 80 cm in males (31.5 in) • ≥ 75 cm in females (29.5 in) Significant cardiometabolic risk • ≥ 90 cm in males (35.4 in) • ≥ 85 cm in females (33.5 in)
China [45]	• Overweight ≥ 24 kg/m^2 • Obesity ≥ 28 kg/m^2	Obesity • ≥ 90 cm in males (35.4 in) • ≥ 85 cm in females (33.5 in)
Japan [48]	• Overweight: not reported • Obesity ≥ 25 kg/m^2	Obesity • ≥ 85 cm in males (33.5 in) • ≥ 90 cm in females (35.4 in)
Taiwan [8]	• Overweight ≥ 24 kg/m^2 • Obesity ≥ 27 kg/m^2	Obesity • ≥ 90 cm in males (35.4 in) • ≥ 80 cm in females (31.5 in)
Māori and Pacific Islanders [8]	• Overweight ≥ 26 kg/m^2 • Obesity ≥ 32 kg/m^2	Obesity • ≥ 102 cm in males (40.2 in) • ≥ 88 cm in females (34.6 in)

BOX 5 | Steps for measuring WC during an HCP appointment.

Step 1: Place the "0" marker of measuring tape at the midpoint between patient's inferior rib margin and iliac crest and ask them to hold it.
Step 2: Ask the patient to spin in a circle, a full 360°. If unable ask if it would be okay for you to walk around them to wrap the measuring tape around their waist.
Step 3: Measure at the end of light exhalation without compressing the skin.
Note: Ensure the measuring tape used can go beyond 102 cm (40 in.). Preferably do not use retractable tape measurers. Consider placing the measuring tape over light clothing while respecting patient's privacy. The NHS has also developed a video for waist circumference measurement [74].

BOX 6 | Anthropometric assessments adapted for patients with disability or unable to stand.

- The Chumlea formula estimates patient stature based on knee height, age, and gender [24, 77].
- Indirect measures of height may be used such as arm circumference and forearm length [20].
- The use of seated or hoist scales, or scales that will accept a wheelchair is recommended [78].
- Consider measuring height with the person lying down [78].

count, thyroid function, nutritional deficiencies, or systemic inflammation (Table 4). However, while laboratory analyses may help refine the diagnosis of obesity and detect obesity-related complications, the variety of assessments makes systematic and comprehensive testing impractical in the primary care setting. Therefore, after reviewing the guidelines, in cases where there is no suspicion of underlying comorbidity or secondary cause of obesity, the most practical vital signs and laboratory assessments to routinely order for patients presenting with obesity may include the following: blood pressure and heart rate, a comprehensive metabolic panel, HbA1c, a lipid panel, complete blood count, and TSH (Table 4). Then, clinicians should use a patient's history as well as their signs and symptoms to evaluate whether additional tests are needed, while minimizing the risk of underdiagnosing obesity-related complications. Finally, it must be noted that these tests should be performed annually as HCPs reassess for obesity, if not more frequently based on clinical scenario [25].

3.2.4.2 | Based on a Patient's Clinical Signs, Symptoms, Initial Vital and Laboratory Results, and Potentially Resources, Additional Tests and Assessments Can Be Performed That Can Help Determine the Etiology of Disease as Well as Relevant Obesity-Related Complications. The focus of obesity management should be about improving a patient's overall health, not simply weight reduction. To help develop an individualized diagnosis, HCPs should aim to understand what additional laboratory abnormalities and complications related to obesity a patient is experiencing or concerned about. Armed with this knowledge, clinicians are better able to formulate an individualized diagnosis and treatment plan. This can also serve as an educational tool for HCPs to teach patients all the different bodily systems impacted by obesity and the wide variety of benefits obesity diagnosis and treatment may have on their overall health.

TABLE 4 | Recommendations on biological measurements, vital signs, and obesity-related complications assessment in a patient with obesity.

Primary recommendations

• When diagnosing obesity HCPs should aim to collect key vital signs and biochemistry parameters including (minimal list):[a]
• Vital signs
  • Blood pressure (both arms, systolic and diastolic)
  • Heart rate
• Comprehensive metabolic panel
  • Electrolytes (e.g., Cl, K, Na)
  • Liver enzymes (AST, ALT, ALP, bilirubin, albumin)
  • Renal function (creatinine, BUN - calculate eGFR and UACR)
  • Glucose
• HbA1c
• Lipid panel (TC, LDL-C, HDL-C, TG)
• Complete blood count
• Thyroid function (TSH)

Secondary recommendations
• Additional laboratory assessments to consider based on patient's history and symptoms:[b] • FIB-4 calculation • Nutritional deficiencies (e.g., Vitamin D, Vitamin B12) • Systemic inflammation (hs-CRP) • Based on history and key vital signs and biochemistry parameters, screen for weight related complications, multimorbidity, and refer to a specialist according to clinical judgment:[c] • T2D and prediabetes • Dyslipidemia • Hypertension • Cardiovascular disease (heart failure, stroke, coronary artery disease) • Liver disease (MASLD and MASH, previously known as NAFLD and NASH, respectively) • Kidney disease • OSA • Reactive airway disease • Osteoarthritis • GERD • Infertility • Cancer • Urinary incontinence • Skin diseases • Sarcopenia

Note: Primary and secondary recommendations on biological measurements, vital signs and obesity-related complications assessment in a patient with obesity. Primary recommendations are supported by multiple guidelines, can be generalized to all individuals living with obesity, and were deemed of critical importance following expert review. Secondary recommendations may include guidance found on individual guidelines but deemed as important supplemental recommendations to include in a PCP framework based on expert review. See detailed recommendations in Supplementary Table 5.

Abbreviations: ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BUN, blood urea nitrogen; FIB-4, fibrosis 4 score; GERD, gastroesophageal reflux disease; HbA1c, glycated hemoglobin A1c; HCP; healthcare provider; HDL-C, high-density lipoprotein-cholesterol; hs-CRP, HIGH-SENSITIVIty C-reactive protein; LDL-C, low-density lipoprotein-cholesterol; MASH, metabolic dysfunction-associated steatohepatitis; MASLD, metabolic dysfunction-associated steatotic liver disease; OSA, obstructive sleep apnea; T2D, type-2 diabetes; TC, Total cholesterol; TG, triglycerides; TSH, thyroid-stimulating hormone; UACR, urine albumin-to-creatinine ratio.

[a][8, 9, 11, 14–17, 20, 22, 24–27, 45, 48, 49, 51, 53, 55, 57, 58, 61].

[b][14, 15, 17, 23, 25–27, 57, 59, 70].

[c][8–11, 14–17, 20–27, 31, 33, 45, 47–49, 52, 53, 55–59, 61, 71, 72].

Some guidelines recommend additional laboratory assessments like the fibrosis-4 index (FIB-4), nutritional deficiencies (vitamin D or B12), and high-sensitivity C-reactive protein (hs-CRP), some of which are starting to be added to routine care by PCPs but a consensus has not been reached to train on or universally incorporate them in the primary care setting (Table 4). However, markers such as FIB-4 could be of special interest in primary care as they can inform on a patient's risk for liver disease (metabolic dysfunction-associated steatotic liver disease [MASLD] or metabolic dysfunction-associated steatohepatitis [MASH]) as well as cardiovascular disease (CVD). Indeed, steatosis is a key predictor of CVD, and in fact, CVD constitutes one of the main causes of death for patients with MASLD [82]. Therefore, early identification and management of liver disease in patients with obesity is of utmost clinical importance. FIB-4 is a biomarker for liver fibrosis calculated from other routinely obtained laboratory parameters such as liver transaminases (AST, ALT) and platelets, as well as patient's age [83]. The American Association for the Study of Liver Diseases (AASLD) recommends that patients with FIB-4 $\geq$ 1.3 (or $>$ 2 if older than 65 years old) should have

a secondary assessment performed (e.g., vibration-controlled elastography (VCTE) or enhanced liver fibrosis [ELF]) or be referred to a specialist [82]. It should be noted that FIB-4 has low accuracy in patients aged less than 35 years old and is not recommended for use in patients who are acutely ill. Additionally, other assessments such as ELF may be preferred in some geographies. With this in mind, FIB-4 may be a biomarker of rising clinical prominence in the primary care setting which may help assess and predict end-organ damage potentially related to obesity such as CVD.

The list of obesity-related complications is extensive [84]; therefore, additional laboratory assessments may be warranted depending on a patient's history, symptoms, and existing complications. Most guidelines recommend testing for type 2 diabetes (T2D), dyslipidemia, hypertension, CVD, liver disease, kidney disease, OSA and reactive airway disease, and osteoarthritis in patients with obesity, as well as gastroesophageal reflux disease (GERD), infertility, cancer, skin disorders, and sarcopenia (Table 4). While assessing for obesity-related complications is essential to understand a patient's full medical picture during the diagnosis and staging of obesity, specialized assessments should be performed based on clinical judgment and patient symptoms [22]. Additionally, having a list of a patient's obesity-related complications can help drive the decision for appropriate weight reduction goals as well as provide insight into factors that can be attributed to disease development.

Several guidelines included an economic perspective in their recommendations for laboratory work and assessments of complications that are relevant to the current healthcare landscape of rising costs and reduced patient provider interaction time. An Italian guideline as well as the EASO 2024 guideline recommended evaluating medical complications and metabolic risk factors according to a systematic and cost-effective manner, which implies that HCPs should consider patient resources when ordering tests and use clinical judgment to prioritize tests of the greatest relevance [10, 64]. However, on the other hand, other guidelines recommend systematic screening of obesity-related complications, in particular CVDs that should be investigated even in asymptomatic patients according to the Saudi Heart Association [71]. Therefore, HCPs should thoroughly review patients' information, anthropometric parameters, as well as primary vital signs and laboratory tests to determine whether specific analyses are necessary while minimizing the risk of undiagnosed comorbidities.

3.2.5 | Staging of Obesity

During diagnosis, HCPs should stage the obesity profile of the patient. The purpose of staging is to help clinicians categorize the severity of a patient's disease which may help evaluate risk and influence treatment decisions [85]. Recommendations on obesity staging suggested the use of different staging systems based on a combination of anthropometrics, complications, and patient's psychological and behavioral parameters. Major recommendations on obesity staging can be found in Table 5; detailed recommendations are listed in Supplementary Table 6.

3.2.5.1 | Multiple Staging Systems Are Available, HCPs Should Pick a Staging System That Best Fits Their Clinical Practice. Recommendations on obesity staging from the reviewed guidelines were highly heterogeneous in complexity. Starting from the simplest, numerous guidelines only relied on BMI classification, which is referred to as obesity classes (or grades; see Box 7) instead of stages. The American Society for Metabolic & Bariatric Surgery (ASMBS) recommended a more advanced system by factoring in both BMI and WC parameters (Box 8) [80]. However, several guidelines did propose different but formal staging systems based on a combination of anthropometrics, obesity-related complications, and some additional elements related to a patient's psychological status and behaviors (Box 8). Among these options, the Edmonton Obesity Staging system (EOSS) was the most frequently recommended staging system for obesity. The EOSS factors in anthropometrics plus multiple of the following: obesity-related complications, functional state, quality of life, emotional status, and patient history (Box 8) [89]. Higher severity disease as scored by EOSS has been associated with increased mortality,

TABLE 5 | Recommendations for the staging of obesity.

Primary recommendations
HCPs should pick a staging system that best fits their clinical practice (see Boxes 7 and 8)[a] • Staging should be based on patient's background and history, physiological and psychological health, and obesity-related complications. • Staging should reflect obesity progression and severity to guide disease management
Secondary recommendations
Additional considerations when staging patients with obesity:[b] • Use ethnicity-adjusted thresholds for obesity staging • Region-adapted staging systems can be considered

Note: Primary and secondary recommendations for the staging of obesity. Primary recommendations are supported by multiple guidelines, can be generalized to all individuals living with obesity, and were deemed of critical importance following expert review. Secondary recommendations may include guidance found on individual guidelines but deemed as important supplemental recommendations to include in a PCP framework based on expert review. See detailed recommendations in Supplementary Table 6.

Abbreviation: HCPs, healthcare providers.

[a][8–11, 16, 20–24, 26, 27, 30, 32, 41, 45–49, 51–55, 57, 59, 64, 75, 80, 85, 91, 92].

[b][8, 15, 51, 53, 71, 80, 88, 91, 92].

BOX 7 | Examples of anthropometrics-based indexes to refine obesity diagnosis

- The Conicity index estimates body fat distribution from WC, body weight and height [75].
- The CUN-BAE index estimates body fat based on age, sex, height and weight [60].
- The Body Adiposity Index estimates body fat from patient's height and hip circumference [57].
- The Woolcott and Bergman relative fat mass equation calculates patients' relative fat mass from height and WC (gender-adjusted) [79].
- The Visceral Adiposity Index estimates visceral adiposity from WC, BMI, TGs, and HDL-C [79].
- The Area Mass Index (AMI) and Body Shape Index (BSI) estimate patients' metabolic activity based on gender and age-adjusted weight and height parameters [49].
- The Visual body composition (VBC) uses smartphone cameras to estimate percentage body fat [29, 79].

BOX 8 | Obesity classes systems.

BMI (WHO) [22, 87]	• Class 1: BMI 30–34.9 kg/m^2 (25–30 kg/m^2 in patients of Asian ethnicity) • Class 2: BMI 35–39.9 kg/m^2 (30–35 kg/m^2 in patients of Asian ethnicity) • Class 3: BMI 40 kg/m^2 or more (35 kg/m^2 or more in patients of Asian ethnicity)
BMI (extended) [88]	• Class 1: BMI 30–34.9 kg/m^2 • Class 2: BMI 35–39.9 kg/m^2 • Class 3: BMI 40–50 kg/m^2 • Class 4: BMI 50–59 kg/m^2 • Class 5: BMI 60–69 kg/m^2 • Class 6: BMI > 70 kg/m^2

in particular EOSS score of 2 (hazard ratio [HR] 1.57, 95% confidence interval [CI] 1.16–2.13) and 3 (HR 2.69, 95% CI 1.98–3.67) versus a score of 0 or 1 [93]. However, in their recommendations, the Italian Obesity Society (SIO) mentioned that the EOSS was based on overly subjective parameters and lacked reference to eating disorders [92]. Additional staging systems were identified during the guideline review including the following: The Lancet's staging system [8], the King's staging system [67, 85], the AACE ABCD staging system [41], and country-specific systems issued by the Chinese Society of Health Management [54], the French Health Authority [91], or the Catalan Society of Family and Community Medicine (CAMFic) [26] (Box 8). While similar, these staging systems used different categorization methods based on diverse parameters. For instance, The Lancet proposed to classify obesity as "preclinical" or "clinical" based on the presence or absence of alterations to the functions of tissues, organs, or the individual related to excess and/or abnormal adiposity [8]. Meanwhile, the King's staging system proposed a broader selection of staging parameters, with particular attention given to OSA and respiratory disorders, patient's economic status, body image, and reproductive health [88]. In fact, a recent guideline recommended to combine The Lancet's and King's systems, resulting in a staging system that would provide clear guidance along with a multidimensional analysis of obesity [85]. In their 2023 position statement, the AACE recommended including internalized weight bias and stigmatization, psychosocial conditions, and patient's quality of life in obesity staging [41]. Regional variations of staging system included the Chinese Society of Health Management which focused exclusively on obesity and associated complications severity [54] or the French system which adopted a broad staging algorithm based on bulimia and hyperphagia, disease etiology, patient's weight trajectory, and past treatments for obesity [91]. Finally, some guidelines adapted existing systems such as the SEEDO which recommended to use a version of the EOSS adapted to the Spanish population [15] or the CAMFiC which factored BMI, WHtR, and EOSS in their staging algorithms [26].

The systems mentioned above are available tools for the assessment of disease severity and ultimately can help determine when to refer to an obesity specialist. It must also be noted that staging algorithms are designed to guide decisions on obesity interventions, a topic that is not addressed in this review. Currently there is no universally accepted staging system, so HCPs should aim to utilize a system that they are best able to implement into their daily clinical practice. Regardless of which staging system is employed, the most important step is to ensure that population-specific parameters are used to record an accurate staging assessment. Finally, it should be noted that no current staging system takes into account the cumulative burden or the additive/multiplicative effect when multiple factors occur simultaneously. This exposes the need for an obesity risk model to be developed.

4 | Discussion: Toward a Practical Primary Care Approach for the Diagnosis and Staging of Obesity

Obesity is a disease which is only expected to increase in prevalence across the globe over the next decades [1]. Guidelines to date have numerous shared recommendations that allow for the development of overall guidance for the diagnosis and staging of obesity but still enough intravariability that providers need to tailor their approach for what best fits their clinical practice. After systematic search and narrative synthesis of guidelines published between January 2014 and 2025, we have proposed a framework for primary care HCPs that focuses on five areas for the diagnosis and staging of obesity driven by consistent recommendations from global guidelines (Figure 3). First, providers should ask for patient's permission to discuss obesity, then take the time to collect and evaluate the most pertinent information of patient's history and background. Next, HCPs should measure a patient's BMI and WC, which should be interpreted using gender- and ethnicity-based thresholds when available. The WHtR can also be calculated which can help assess obesity-related risk in the absence of established thresholds. Depending on provider preference and patient or clinic resources, other anthropometrics and body composition analyses may be performed to help make the diagnosis of obesity. To complement anthropometric

BOX 9 | Obesity staging systems.

Staging based on anthropometrics	
WC and BMI (ASMBS) [80]	• Category 1: BMI 30–34.9 kg/m^2, WC ≥ 110 cm in males (43.3 in) or 105 cm in females (41.3 in) • Category 2: BMI ≥ 35 kg/m^2, WC ≥ 125 cm in males (49.2 in) or 115 cm in females (45.3 in)
Staging based on anthropometrics, obesity-related complications and other parameters	
The Lancet's Pre-Clinical and Clinical Obesity Definitions [8]	• Pre-clinical obesity is characterized by excessive adiposity while organ and tissue functions are preserved. Pre-clinical obesity increases the risk of developing obesity-associated complications • Clinical obesity is characterized by altered tissue, organ, or individual function due to excessive and/or abnormal adiposity and is based on 18 clinical characteristics
Edmonton Obesity Staging System (EOSS, adapted from Sharma & Kushner, 2009) [89]	Based on obesity-related risk factors and comorbidities: physical symptoms, psychopathology, functional limitations and/or impairment of well being • Stage 0: No sign of risk factor, physical symptoms, psychopathology, functional limitations and/or impairment of well being • Stage 1: Presence of subclinical risk factors, mild physical symptoms, mild psychopathology, mild functional limitations and/or mild impairment of well being • Stage 2: Presence of established obesity-related chronic disease, moderate limitations in activities of daily living and/or well being • Stage 3: Established end-organ damage, significant psychopathology, significant functional limitations and/or impairment of well being • Stage 4: Severe (potentially end-stage) disabilities from obesity-related chronic diseases, severe disabling psychopathology, severe functional limitations and/or severe impairment of well being
King's staging system (Adapted from Aylwin & Al-Zaman, 2008) [67, 85, 90]	King's obesity staging is based on 10 components: Airway/apnea; BMI and WC; CVD risk; Diabetes; Economic complications; Functional status and musculoskeletal; Gonadal and reproductive axis; Perceived health status and stages of change; Body image/eating behavior; Other medical complications. There are 3 stages defined by the severity of each of the 10 components
AACE's staging for ABCD [16, 41]	Based on ABCD complications and severity as well as internalized weight bias and stigmatization, psychological conditions, or social determinants of health impacting patient's quality of life and treatment efficiency. • Stage 1: ABCD has no identifiable adiposity-based complications • Stage 2: has mild-to-moderate adiposity-based complications • Stage 3: has severe adiposity-based complications
Chinese Society of Health Management [54]	Based on obesity diagnosis and presence of complications • Stage 0: Overweight with no related subclinical conditions or diseases • Stage 1: Overweight with one or more related subclinical conditions, or obesity with or without any related subclinical conditions • Stage 2: Overweight or obesity with one or more mild-to-moderate overweight-related or obesity-related disease • Stage 3: Overweight or obesity with one or more severe overweight-related or obesity-related disease
Spanish CAMFiC/SEMFYC staging system [26]	Stage obesity as “low-moderate risk obesity”, “moderate-high-risk obesity” or “high-very-high risk obesity” based on BMI, WHtR, and EOSS score

BOX 9 | (Continued)

Staging based on anthropometrics	
French Health Authority Staging system [91]	Based on 7 components: BMI, comorbidities, functional and quality of life, psychological and cognitive impairment, etiology, eating disorders (hyperphagia/bulimia), and weight trajectory (childhood, relapses, treatment failure). There are 3 stages, with stages 1 and 3 subdivided into two sub-stages, all defined by the severity of each component. • Stage 1a: BMI 30 to 35 kg/m^2 without comorbidities or impairments • Stage 1b: BMI 30 to 35 kg/m^2 with moderate or controlled comorbidities OR impairments without hyperphagia/bulimia OR with primary etiology • Stage 2: BMI 35 to 50 kg/m^2 with significant comorbidities OR functional/QoL impairments OR episodic bulimia OR aggravated primary etiology/medical cause OR persistent childhood obesity/2 relapses OR more/pharmacological treatment failure/pregnancy after bariatric surgery • Stage 3a: BMI 35 to 50 kg/m^2 with severe comorbidities OR functional/QoL impairments OR hyperphagia OR hormonal/tumoral etiology OR uncontrolled weight trajectory/surgical treatment failure • Stage 3b: BMI 50 kg/m^2 or more with end-stage comorbidities OR severe functional/QoL impairments OR monogenic/syndromic etiology OR surgical treatment failure/high risk surgery indication

measures and help evaluate complications, HCPs should collect vital signs and order laboratory assessments including comprehensive metabolic panel, complete blood count, lipid panel as well as HbA1c and TSH. Assessing functionality and sarcopenia through targeted tools is highly relevant for older and frail adults. Additional tests and screenings for complications of obesity can be performed but should be individualized based on history, background, and a patient's clinical signs and symptoms. Lastly, HCPs can choose to use a staging system to help characterize the severity of disease.

This review strives to provide practical recommendations for obesity diagnosis in a primary care setting. As such, challenges may remain given a limit in time and resources to capture all five areas of diagnosis (Figure 3). Therefore, primary care HCPs should rely on information obtained during previous visits or use questionnaires to collect patient-reported parameters. The comprehensive diagnosis could also be spread over several visits. For instance, a first visit could consist of preliminary identification, background and history, and anthropometric measurement. Then, based on the outcomes of this first visit, the HCP would determine the need for another visit to perform laboratory analyses to assess for obesity-related complications, stage obesity, or to refer to a specialist. Overall, this framework may serve as a comprehensive tool that HCPs can use to help identify patients they can best manage versus those with more complex or secondary obesity, needing referral to a specialist.

Although the guidelines reviewed followed a broadly similar structure and addressed comparable domains and while this review did not set out to compare individual guidelines or conduct formal appraisal of the methodologies for the development of the guidelines, notable content heterogeneity emerged between them such as on recommendations of anthropometric measures and staging systems. These differences may be attributed to the time range used to identify published guidelines as obesity care has evolved over the years as well as ethnic and cultural differences between countries.

This manuscript complements previous reviews published on the topic of obesity diagnosis and management [94–96]. Notably, Tandar et al. recommended a similar clinically-oriented framework on obesity diagnosis and management [95], also recommending moving away from a BMI-centric diagnosis while adapting the approach to primary care constraints. Doody et al. and Semlitsch et al. both used a systematic search strengthened by a quality assessment of the guidelines. While it focused solely on obesity management, Doody et al. developed a strict comparison matrix allowing readers to appreciate the differences in content between guidelines. Their team also reported facing similar challenges in identifying and extracting information from multinational sources [96]. Similarly, Semlitsch et al. also developed a structured comparison matrix reporting the differences in content between guidelines of high-income countries, eventually providing the reader with a condensed list of nine key recommendations on obesity diagnosis and management [94].

Our review stands out by its multinational representativeness, including multiple regions, countries and languages, allowing us to include a larger number of guidelines compared to previous publications. This review also took an approach focused exclusively on obesity diagnosis and staging, while excluding recommendations on obesity management which enabled a more detailed discussion of each component. Finally, our narrative synthesis manuscript strived to reflect the complexity of obesity diagnosis while enhancing its accessibility from a PCP perspective. Here, we provide a practical guidance tool

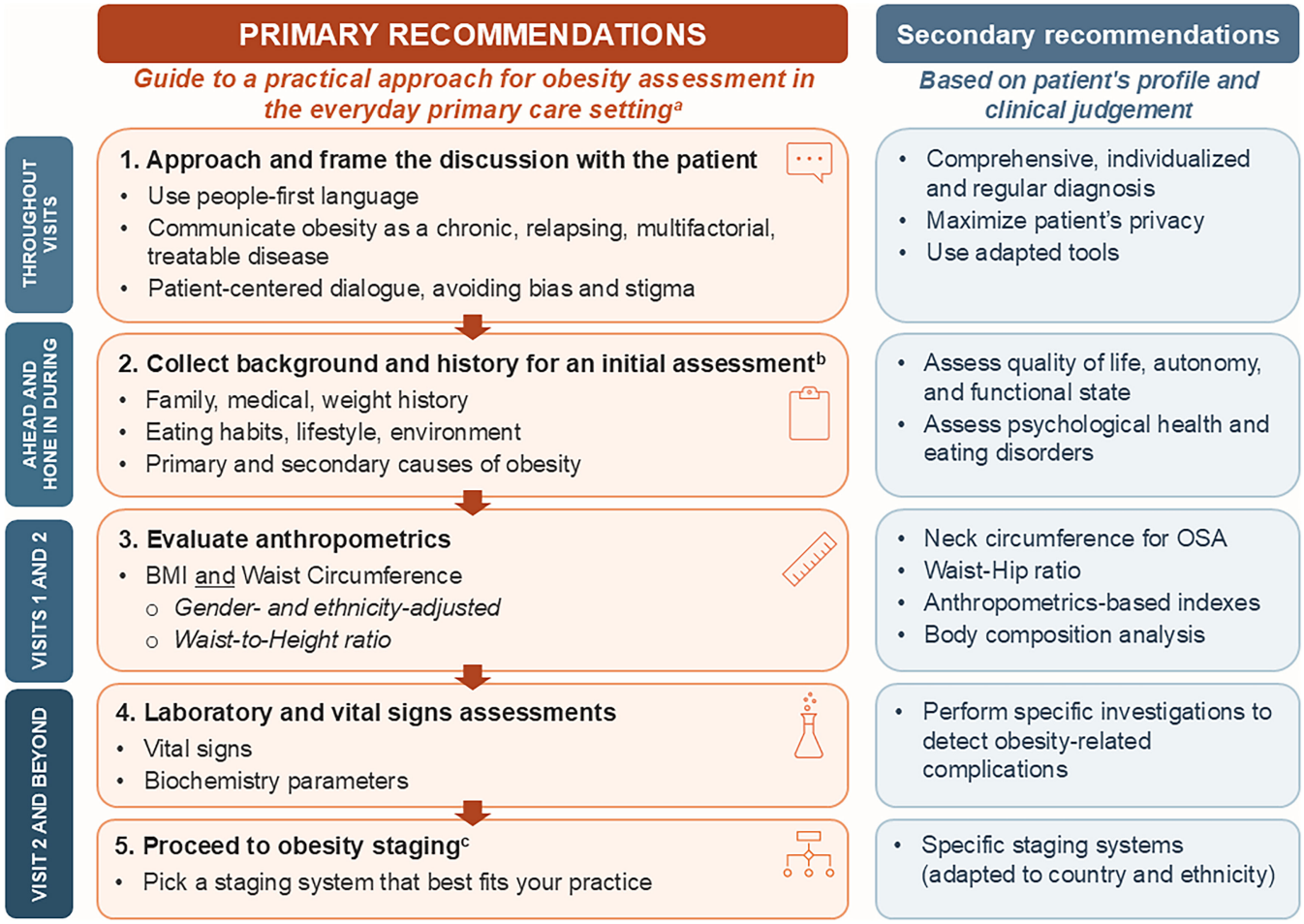

FIGURE 3 | Practical primary care approach for obesity diagnosis and staging. A practical guide of primary and secondary recommendations for obesity diagnosis and staging in a primary care clinic. (a) Based on the primary care physician's clinical judgement and planned consultation length with the patient, obesity diagnosis assessments may be performed over several visits and be prioritized based on the patient's clinical needs and personal circumstances. Technology can be leveraged to facilitate clinical data collection when possible. (b) Collection of patient background and pre-existing medical history may be performed ahead of a visit using digital forms. Digital forms may also apply to questionnaire-based assessments such as QoL, functional state, or psychological health. (c) Technology such as online tools, calculators, or electronic medical record functions can help facilitate obesity staging. BMI, body mass index; HCPs, healthcare professionals; OSA, obstructive sleep apnea.

structuring obesity diagnosis around five sequential steps. Each step included "Primary" and "Secondary" recommendations to help manage limited resources, complexity, and prioritization in a primary care setting (Figure 3).

4.1 | Strengths and Limitations

A main strength of this narrative review is the systematic appraisal of literature pertaining to published guidelines as well as the extraction of information on obesity diagnosis and staging based on pre-determined criteria. A further strength is the contribution of a group of international obesity and primary care experts, bringing a broad perspective concerning obesity management. Finally, this review aimed to provide a global perspective, summarizing evidence and practical tools to PCPs across a wide range of geographies. To our knowledge, this is one of the most recent publications providing recommendations and tools to facilitate primary care physicians in the diagnosis and staging of patients living with obesity.

This review also has limitations. Although a systematic literature search was utilized, the authors used a narrative synthesis to formulate recommendations. This narrative synthesis, including "Primary" and "Secondary" recommendations included author interpretation of the literature, which involves potential selection bias. Additionally, the systematic search needed to be supplemented by a manual search, from which more than half of the reviewed guidelines were extracted. The manual extraction approach may have introduced potential bias in source document identification, as well as the risk of missing relevant content. The literature search included a limited pool of regions or countries, and guidelines from all countries were not included, therefore restricting the global generalizability of our findings. Furthermore, this review did not include guidelines that were published after June 2025 when the authors performed the last literature search. Another key limitation of this review may be the variability among source materials: Guidelines from different countries and societies have been developed using different methodologies and approaches to obesity diagnosis and staging. This

review did not include a quality assessment of source materials (e.g., the AGREE II framework) as this was outside the scope of this work.

4.2 | Conclusion

This multinational systematic search and narrative synthesis review aims to provide practical recommendations for obesity diagnosis in a primary care setting. PCPs may consider implementing these recommendations based on their own resources, patient profile, and clinical judgment.

Author Contributions

H.T.H., G.K.D., and G.L.C. conceptualized and designed the project. H.T.H., G.K.D., and G.L.C. carried out the screenings and reviews and the analysis of the articles. H.T.H., G.K.D., and G.L.C. drafted the manuscript. K.K., G.C., E.L., S.Z.-R., N.A.X. and M.H. revised the manuscript. All authors read and approved the final manuscript.

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Conflicts of Interest

K.K. has acted as a consultant, speaker, or received grants for investigator-initiated studies for Abbott, Astra Zeneca, Bayer, Hikma, Novo Nordisk, Sanofi-Aventis, Servier, Eli Lilly and Company, Merck Sharp & Dohme, Boehringer Ingelheim, Oramed Pharmaceuticals, Pfizer, Roche, Daiichi-Sankyo, Applied Therapeutics, Embecta and Nestle Health Science. G.C. has acted as a consultant and speaker for Abbott, Astra Zeneca, Novo Nordisk, Roche Diabetes, Lilly, Boehringer Ingelheim. E.L. declares financial support and speaking and lecture fees from Currax Pharmaceuticals LLC, consulting or advisory and speaking and lecture fees from Eli Lilly and Company, speaking and lecture fees from Novo Nordisk Inc., consulting or advisory relationship with Boehringer Ingelheim, and board membership with the Obesity Medicine Association. G.L.C., S.Z.-R., N.A.X., M.H., G.K.D., and H.T.H. are employees and shareholders of Eli Lilly and Company.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Table S1:** Literature search terms and results. **Table S2:** Recommendations on proactive and non-stigmatizing patient-centered communication and assessment. **Table S3.1:** Recommendations for the collection of background and history and initial assessment of the patient with obesity. **Table S3.2:** Recommended tools for the assessment of quality of life, autonomy, functional state, and psychological health during obesity diagnosis. **Table S4:** Recommendations for anthropometric and body composition assessments of the patient with obesity. **Table S5:** Recommendations on biological and vital signs measurements, and assessment of obesity-related complications in the patient with obesity. **Table S6:** Recommendations on the staging of obesity. **Table S7:** List of abbreviations for societies and governmental bodies.