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CLINICAL REVIEWS

Childhood Obesity: An Update on Prevention, Evaluation, and the Expanding Treatment Landscape

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Background

Childhood obesity is a chronic, relapsing disease with significant short- and long-term cardiometabolic, psychosocial, and economic consequences. Over the past decade, advances in clinical research and updated professional guidelines have reshaped the evaluation, prevention, and management of pediatric obesity.

Methods

This narrative review synthesizes contemporary evidence published between 2016 and 2026, including major clinical practice guidelines, randomized controlled trials, systematic reviews, and implementation studies addressing screening, prevention strategies, intensive lifestyle treatment, pharmacotherapy, and metabolic and bariatric surgery in children and adolescents.

Results

Body mass index (BMI) percentile remains the primary screening tool, with annual assessment recommended for children aged 2–18 years. Early identification should be followed by structured evaluation for comorbidities, including dyslipidemia, abnormal glucose metabolism, hypertension, and nonalcoholic fatty liver disease. Intensive health behavior and lifestyle treatment (IHBLT), defined as ≥26 hours of family-based, multicomponent counseling over 3–12 months, is the foundation of therapy and consistently produces clinically meaningful BMI reductions. For adolescents aged ≥12 years with persistent obesity, pharmacotherapy — particularly glucagon-like peptide-1 (GLP-1) receptor agonists such as semaglutide and liraglutide — has demonstrated significant additional BMI reductions. Metabolic and bariatric surgery offers the greatest and most durable weight loss for adolescents with severe obesity, with substantial remission of cardiometabolic comorbidities. Prevention efforts are most effective when multicomponent, school- and community-based, and supported by structural and policy changes.

Conclusions

Pediatric obesity requires early identification, active treatment, and longitudinal management within a chronic disease framework. Evidence supports a stepped, multimodal approach integrating family-centered behavioral interventions, pharmacotherapy when indicated, and surgical referral for severe disease.

Addressing health inequities, improving access to evidence-based treatments, and reducing weight stigma remain essential to optimizing outcomes for diverse pediatric populations.

Key Points

- BMI percentile remains the standard screening tool for childhood obesity; annual assessment and structured comorbidity evaluation are recommended for all children aged 2–18 years.
- Intensive health behavior and lifestyle treatment (IHBLT) providing ≥26 hours of family-based multicomponent counseling is first-line therapy; GLP-1 receptor agonists and bariatric surgery are evidence-based adjuncts for eligible adolescents.
- Effective prevention and treatment require sustained, multicomponent strategies that address social determinants of health, reduce weight stigma, and expand equitable access to evidence-based interventions.

Introduction

Childhood obesity is one of the most pressing public health challenges of the 21st century. Approximately 17% of U.S. children and adolescents meet criteria for obesity, with rising global prevalence over the past four decades.[1,2] Excess adiposity in childhood is associated with insulin resistance, hypertension, dyslipidemia, nonalcoholic fatty liver disease, obstructive sleep apnea, depression, and increased risk of premature cardiovascular mortality in adulthood. Beyond individual health consequences, pediatric obesity imposes substantial healthcare expenditures and contributes to widening health disparities, with elevated BMI linked to an estimated $1.4 billion in additional annual healthcare costs compared with normal-weight peers.[1,3,4]

Recent clinical practice guidelines, including the 2023 American Academy of Pediatrics (AAP) Clinical Practice Guideline, have reframed pediatric obesity as a chronic, biologically and socially mediated disease requiring proactive and sustained treatment rather than watchful waiting. The therapeutic landscape has evolved with expansion of intensive family-based behavioral treatment models, approval of novel anti-obesity pharmacotherapies for adolescents, and increasing evidence supporting metabolic and bariatric surgery in carefully selected patients.

This narrative review synthesizes contemporary evidence on the evaluation, prevention, and management of childhood obesity, with emphasis on practical clinical application, emerging therapies, and implementation challenges.

Methods

This narrative review synthesizes current evidence and clinical guidance on pediatric obesity prevention, evaluation, and management. The narrative approach was selected because the topic spans multiple heterogeneous dimensions - including treatments and social determinants of health - with varied research designs, populations, and outcome measures that limit systematic review or meta-analytic approaches.

PubMed was the primary database, with a search time frame of January 2016 to January 2026. The search employed MeSH terms and keywords including: "childhood obesity," "pediatric obesity," "adolescent obesity," "BMI screening," "obesity prevention," "lifestyle intervention," "behavioral therapy," "intensive health behavior and lifestyle treatment," "obesity pharmacotherapy," "GLP-1 receptor agonist," "liraglutide," "semaglutide," "bariatric surgery," "metabolic surgery," "obesity comorbidities," "social determinants of health," "school-based interventions," and "family-based treatment." Reference lists of relevant guidelines, systematic reviews, and meta-analyses were manually searched for additional pertinent studies.

Eligibility criteria encompassed publications addressing: epidemiology and prevalence; BMI definition and assessment; obesity-related comorbidities; risk factors and social determinants; prevention at school, community, or family levels; and treatment with IHBLT, diet, exercise, behavioral therapy, pharmacotherapy (including GLP-1 agonists and other FDA-approved agents), and bariatric surgery. Clinical practice guidelines from major professional organizations were included. Articles addressing adult-only populations, non-generalizable cohorts, or unsupported opinion pieces were excluded.

Included literature comprises clinical practice guidelines, randomized controlled trials, systematic reviews, observational cohort studies, cross-sectional studies, implementation reports, and epidemiologic modeling studies. As a narrative review, formal risk-of-bias assessment was not employed; studies were evaluated qualitatively on methodological rigor, design transparency, sample size, follow-up duration, intervention transparency, and clinical relevance, with greater weight given to recent clinical guidelines, systematic reviews, and large-scale randomized trials.

Evaluation and Assessment of Childhood Obesity

Diagnostic Criteria and Screening Recommendations

Body mass index (BMI) is the primary screening and diagnostic measure for childhood obesity given its simplicity, reproducibility, and strong correlation with adiposity.[1] The 2023 AAP Clinical Practice Guideline recommends that clinicians routinely measure height and weight, calculate BMI, and determine BMI percentile using age- and sex-specific CDC growth charts at least annually for all children aged 2–18 years.[4] Children with BMI at or above the 85th but below the 95th percentile are categorized as overweight; those at or above the 95th percentile meet criteria for obesity. Severe obesity is further classified as class 2 (BMI 120%–139% of the 95th percentile) and class 3 (BMI ≥140% of the 95th percentile).[1,4,5]

BMI does not distinguish lean mass from adipose tissue and may relate differently to health risks across racial and ethnic groups due to variation in body fat composition at equivalent BMI values. For example, non-Hispanic Black children tend to have lower body fat percentages than non-Hispanic White or Mexican American peers at the same BMI, whereas Asian children exhibit higher body fat percentages than White reference populations. Despite these limitations, BMI remains the most practical and widely used tool for screening and diagnosing childhood obesity.[2]

Comprehensive Clinical Evaluation

The 2023 AAP guideline emphasizes that evaluation should encompass a comprehensive history covering nutrition patterns, physical activity, sedentary behaviors, sleep, social determinants of health, and mental/behavioral health, in addition to physical examination and laboratory assessment.[5]

Physical examination should include accurate blood pressure measurement with appropriately sized cuffs beginning at age 3; inspection for acanthosis nigricans and skin tags as markers of insulin resistance; assessment of pubertal maturation; and musculoskeletal evaluation for conditions such as slipped capital femoral epiphysis and Blount disease.[5] Blood pressure should be classified using age-, sex-, and height-specific percentiles in children under 13 years, with adult cutoffs (≥130/80 mmHg for stage 1 hypertension) applied for adolescents ≥13 years.[1]

Behavioral health assessment is critical given the increased prevalence of depression and anxiety among youth with obesity. Clinicians should screen all children with obesity for depression and conduct annual evaluation in adolescents ≥12 years using a validated tool such as the Patient Health Questionnaire-9 for Adolescents.[5]

Screening for Obesity-Related Comorbidities

Clinicians should obtain a sleep history - including snoring, daytime somnolence, nocturnal enuresis, morning headaches, and inattention - in all children with obesity to evaluate for obstructive sleep apnea (OSA). Polysomnography is indicated when at least one symptom of disordered breathing is present.[4,5] OSA affects up to 45% of children with obesity and is associated with cardiovascular complications and neurocognitive impairment.[4]

Female adolescents with obesity should be evaluated for menstrual irregularities and signs of hyperandrogenism to assess for polycystic ovarian syndrome, with evaluation deferred to at least 2 years after menarche given the frequency of irregular cycles during adolescence.[4] Clinicians should maintain a high index of suspicion for idiopathic intracranial hypertension in children with obesity presenting with new-onset or progressive headaches, particularly females with significant weight gain.[5]

Laboratory Evaluation

Children aged ≥10 years with obesity should be evaluated for dyslipidemia, abnormal glucose metabolism, and liver dysfunction. Children aged ≥10 years with overweight may be evaluated for these conditions when additional risk factors are present, such as family history of type 2 diabetes, signs of insulin resistance, or use of obesogenic medications.[4,5] Lipid evaluation may be considered in children aged 2–9 years with obesity.[1]

Fasting lipid panels are recommended for children aged ≥10 years with obesity. Screening for type 2 diabetes should include fasting plasma glucose, 2-hour oral glucose tolerance testing, or glycated hemoglobin, though HbA1c alone may be insufficient to detect early disease.[4,5] Evaluation for nonalcoholic fatty liver disease should include alanine aminotransferase measurement; persistent elevations (>25 IU/L in boys, >22 IU/L in girls) raise concern for hepatic pathology.[4] Measurement of fasting insulin levels is not recommended by Endocrine Society guidelines, as it lacks diagnostic utility for assessing insulin resistance in children.[1] Laboratory evaluation should be repeated every 2 years if initial results are normal, or more frequently if abnormal.[4] Table 1 summarizes recommended comorbidity screening in pediatric obesity.

Prevention Strategies

Early-Life Interventions

Prenatal factors associated with childhood obesity include maternal pre-pregnancy obesity, excessive gestational weight gain, gestational diabetes, and maternal smoking. Early childhood exposures associated with later obesity include antibiotic exposure in infancy and adverse childhood experiences.[2]

Table 1. Comorbidity Screening Recommendations in Pediatric Obesity

Comorbidity	Screening Recommendation
Dyslipidemia	Fasting lipid panel for children ≥10 years with obesity or overweight; consider for children 2–9 years with obesity[1]
Prediabetes/Diabetes	Fasting glucose, 2-hour OGTT, or HbA1c for children ≥10 years with obesity or overweight[1]
NAFLD	ALT for children ≥10 years with obesity or overweight[1]
Hypertension	Blood pressure at every visit starting at age 3 years[1]
OSA	Sleep history at every visit and polysomnography if symptomatic[1]
PCOS	Evaluate adolescent females with obesity for menstrual irregularities and hyperandrogenism[1]
Depression/Anxiety	Annual screening for adolescents ≥12 years[1]
SCFE/IIH	Clinical vigilance for musculoskeletal and neurologic symptoms[1]

OGTT = oral glucose tolerance test; HbA1c = glycated hemoglobin; NAFLD = nonalcoholic fatty liver disease; ALT = alanine aminotransferase; OSA = obstructive sleep apnea; PCOS = polycystic ovarian syndrome; SCFE = slipped capital femoral epiphysis; IIH = idiopathic intracranial hypertension.

Evidence regarding infant and young child feeding practices is mixed. Jebeile et al. report a modest protective effect of breastfeeding against childhood obesity based on two meta-analyses,[2] while the 2017 Endocrine Society and AAP guidelines offer a strong recommendation for breastfeeding based on broad infant health benefits but only a weak recommendation specifically for obesity prevention, citing mixed results.[1,4] Evidence for an association between early complementary food introduction (before 4 months) and childhood obesity remains inconsistent across reviews.[1,2]

Small associations have been observed between parental feeding approaches and childhood obesity, though residual confounding must be considered. Controlling feeding practices - restricting specific foods or overall intake - has been associated with higher child weight, whereas responsive feeding in response to infant hunger or satiety cues is associated with lower BMI.[2]

A 2025 individual participant data meta-analysis (TOPCHILD) of parent-focused behavioral interventions delivered up to 12 months of age found insufficient effects on BMI z-score at 24 months or on key obesity-related behavioral outcomes, underscoring the need to rethink early-life behavioral approaches to obesity prevention.[2]

Behavioral Targets in Obesity Prevention

Dietary factors increasing obesity risk include excess consumption of energy-dense, micronutrient-poor foods and sugar-sweetened beverages. Clinical guidelines recommend avoiding calorie-dense, nutrient-poor foods - including sugar-sweetened beverages, sports drinks, fruit juices, foods with added sugar, high-fructose corn syrup, and high-fat or high-sodium processed foods - and favor consumption of whole fruits over juices.[1] Reducing sugar-sweetened beverage intake is particularly effective, as evidence indicates these beverages do not increase satiety.[1]

Low physical activity levels contribute significantly to pediatric obesity, driven by loss of recreational space, increased motorized transport, safety concerns, and passive entertainment. Guidelines recommend children and adolescents engage in a minimum of 20 minutes (ideally 60 minutes) of vigorous physical activity at least 5 days per week.[1]

Screen time contributes to obesity risk via exposure to food marketing, increased mindless eating, reduced sleep time, and displacement of physical activity.[3] Guidelines recommend limiting nonacademic screen time to 1–2 hours per day; effective strategies include parental engagement, device monitoring, and removing bedroom electronic game access.[1,2]

Short sleep duration, poor sleep quality, and late bedtimes are associated with higher obesity risk, insulin resistance, sedentary behaviors, and poor dietary patterns.[2] Guidelines recommend 8–11 hours of sleep for children and adolescents and suggest fostering healthy sleep patterns, while acknowledging mixed findings in the literature.[1]

School-Based Interventions

Schools are uniquely positioned to influence children's health behaviors through physical activity, health education, and policy interventions.[1] A 2024 Cochrane review of 172 studies (189,707 participants) found that school-based activity interventions, alone or combined with dietary components, may produce modest beneficial effects on obesity at short- and medium-term follow-up, but not at long-term follow-up (≥15 months).[6] Dietary interventions alone resulted in little to no difference in BMI. Combined dietary and activity interventions likely reduce BMI at medium-term follow-up (9–15 months) but show little to no effect long-term.[6]

Multicomponent approaches are consistently more effective than single-component programs.[7-9] Bleich et al., analyzing 41 studies, found all RCTs with positive outcomes in school settings included a home component and combined diet and exercise.[7] Nikooyeh et al., in a meta-analysis of 61 studies, found that combining physical activity, health education, and school policy interventions had the highest effectiveness in reducing BMI.[8] Anselmi et al. similarly found in a review of 6 systematic reviews that interventions targeting both physical activity and healthy eating outperformed those targeting only one domain.[9]

Structural and environmental changes - such as upgrading playgrounds, improving walking and cycling infrastructure, enhancing cafeterias, and introducing school gardens - support positive behavior outcomes.[9] Duration also matters: Anselmi et al. found that interventions lasting over 6 months with follow-up beyond 12 months had greater success,[9] while Bleich et al. reported that all positive-outcome interventions had been implemented for at

least one full school year (~9 months).[7] Despite these findings, limited long-term effects highlight the need for sustained, systems-level approaches rather than time-limited programs.[6]

Family and Home-Based Interventions

Clinical guidelines recommend that obesity prevention efforts involve the entire family rather than the child alone.[1] However, evidence for home-based interventions is limited and mixed.[6,7] Of 172 studies in the Cochrane review, only 8 delivered interventions exclusively in the home setting.[6] Two home-based RCTs analyzed by Bleich et al. both showed null results, with no significant difference in BMI z-scores at 12 and 21 months.[7]

It is important to distinguish between home-based interventions (delivered in the home) and family-based treatment (intensive behavioral interventions that engage parents regardless of setting). Family-based behavioral treatment in primary care settings improves weight outcomes for children, parents, and untreated siblings over 24 months.[5] Medium- to high-intensity parental involvement is associated with better outcomes. Effective family engagement strategies include promoting intrinsic motivation, shared goal-setting, problem-solving, social support, role modeling, and home environment restructuring.[5]

Family dynamics are also relevant: family dysfunction - characterized by poor communication, poor behavioral control, low cohesion, high conflict, or interpersonal violence - is associated with increased pediatric obesity risk.[1] Guidelines recommend that clinicians assess family function and address family stressors as part of obesity prevention efforts.[1]

Policy and Systems-Level Interventions

Effective obesity prevention requires integrated multicomponent approaches across multiple stakeholders and settings.[6] Single-component interventions (diet alone, physical activity alone, home-based alone) have limited long-term effectiveness, highlighting the need for comprehensive, sustained, systems-level strategies.[6]

The 2023 AAP guideline identifies social determinants of health (SDoH) as central obesity risk factors, encompassing broader policies and systems; schools and institutions; neighborhoods and communities; and family, socioeconomic, environmental, ecological, genetic, and biological factors.[5] These factors overlap and interact across childhood and adolescence, driving weight gain and escalating existing obesity. The AAP recommends that clinicians perform initial and longitudinal assessment of individual, structural, and contextual risk factors to provide individualized, tailored care.[5]

The Cochrane review identified evidence gaps for home- and community-based settings, children with disabilities, and indicators of health inequities.[6] Limited exploratory analyses suggest current interventions have no meaningful impact on reducing disparities, underscoring the need for policy- and systems-level interventions that extend beyond individual behavior change.[6]

Social Determinants of Health and Health Equity

Childhood obesity results from multifactorial socioecological, environmental, and genetic influences.[5] The term "disparities" describes differences in disease prevalence and outcomes across populations defined by ethnicity, race, gender, and age; however, "inequities" better captures the underlying causes - including structural racism and the absence of economic, civil-political, cultural, or environmental conditions required to generate parity.[5]

This distinction is particularly important for obesity because obesity-related risk factors are embedded in children's socioecological environments. Stigmatizing children with obesity on the basis of race, ethnicity, age, or sex without acknowledging the systemic challenges that cause and maintain inequities is harmful.[5] Given the limited long-term effectiveness of individual-level interventions and the lack of evidence that such interventions reduce health inequalities, upstream policy and systems-level interventions addressing SDoH may be necessary to achieve sustained reductions in childhood obesity prevalence and to reduce inequities.[5,6]

Treatment Approaches

Updated clinical practice guidelines represent a paradigm shift toward family-centered, non-stigmatizing approaches that acknowledge obesity's biologic, social, and structural drivers.[5] There is no evidence to support watchful waiting or unnecessary delay of treatment; participation in structured weight management programs has been shown to decrease current and future eating disorder symptoms for up to 6 years following treatment.[4] The AAP endorses a chronic care model integrating medical, behavioral, and surgical interventions, with motivational interviewing and family-centered care coordinated through the medical home.

Intensive Health Behavior and Lifestyle Treatment

IHBLT is the first-line treatment for pediatric obesity in children ≥6 years, with the most consistent BMI reductions in programs providing ≥26 hours of face-to-face, family-based, multicomponent treatment over 3–12 months.[4, 5] The 2024 USPSTF recommendation states that clinicians should offer or refer children and adolescents aged ≥6 years with BMI at or above the 95th percentile to intensive, multicomponent behavioral interventions.[10]

Table 2. FDA-Approved Anti-Obesity Medications for Adolescents

Medication	Approved Age	Mechanism	Average BMI Reduction	Key Adverse Effects
Semaglutide	≥12 yr	GLP-1 RA	≈16%	GI symptoms, gallbladder disease
Phentermine/ Topiramate ER	≥12 yr	Appetite suppression (sympathomimetic + GABA modulation)	≈8–10%	Paresthesias, mood changes, increased HR, teratogenic
Liraglutide	≥12 yr	GLP-1 RA	≈4–5%	GI symptoms, pancreatitis risk
Orlistat	≥12 yr	Lipase inhibitor	≈3%	Steatorrhea, fecal urgency, decreased fat-soluble vitamins
Setmelanotide*	≥6 yr	MC4R agonist	Substantial (genetic obesity only)	Injection reactions, hyperpigmentation

GLP-1 RA = glucagon-like peptide-1 receptor agonist; GABA = gamma-aminobutyric acid; HR = heart rate; MC4R = melanocortin 4 receptor.
*Setmelanotide approved for POMC deficiency, PCSK1 deficiency, leptin receptor deficiency, or Bardet-Biedl syndrome only.

IHBLT programs typically combine dietary counseling, physical activity promotion, behavioral change techniques (goal setting, self-monitoring, problem-solving), and family engagement.[5] A 2023 RCT by Epstein et al. demonstrated that family-based behavioral treatment in pediatric primary care was superior to usual care in reducing BMI in children aged 6–12 years over 24 months, with benefits also observed in parents and untreated siblings.[11] A scoping review by Li et al. found that multicomponent programs targeting dietary, physical activity, behavioral, and family components achieve the most consistent BMI z-score reductions.[12] A USPSTF systematic review confirmed that intensive behavioral interventions produce greater BMI reductions than less intensive conditions, with effects concentrated in programs providing ≥26 hours of contact over 12 months.[13]

Pharmacotherapy

For adolescents aged ≥12 years with obesity that has not responded adequately to IHBLT, pharmacotherapy is an evidence-based adjunct.[4,5] Current FDA-approved options include semaglutide, liraglutide, phentermine/topiramate extended-release, and orlistat; setmelanotide is approved for select rare genetic obesity syndromes. A 2024 network meta-analysis by Shamim et al. confirmed that semaglutide was associated with the greatest BMI reductions in adolescents, followed by liraglutide and orlistat compared to placebo.[14] Phentermine/topiramate ER has demonstrated 8–10% average BMI reduction in clinical studies.[1]

Weight regain following medication discontinuation is expected and underscores obesity's chronic nature; one liraglutide trial reported a BMI difference from baseline of less than 2% after a 6-month withdrawal period.[7] Cost and insurance coverage are major barriers: semaglutide costs approximately $1,300 per month, and most state Medicaid plans exclude anti-obesity medications.[3] Table 2 summarizes FDA-approved anti-obesity medications for adolescents.

Metabolic and Bariatric Surgery

Metabolic and bariatric surgery (MBS) is the most effective and durable treatment for severe adolescent obesity and its comorbidities.[4,15] Current guidelines recommend MBS consideration for adolescents aged ≥13 years with class 2 obesity and at least one obesity-related comorbidity, or class 3 obesity regardless of comorbidities, after inadequate response to lifestyle and medical management.[4] Roux-en-Y gastric bypass and sleeve gastrectomy are the most commonly performed procedures. Long-term data from Teen-LABS and other cohorts demonstrate sustained weight loss averaging 25%–40% of initial body weight at 5–8 years, with high rates of remission of type 2 diabetes and hypertension.[15] Perioperative major complication rates are approximately 8%, with minor complications (nausea, dehydration) in 15% within 30 days.[4] Long-term risks include nutritional deficiencies - particularly iron, vitamin B12, vitamin D, and calcium - and decreased bone mineral density.[15] Psychological outcomes are complex; quality of life improves in the short term, but mental health concerns may persist, necessitating ongoing psychosocial support.[15]

Comprehensive Treatment Pathways

The 2023 AAP guidelines emphasize treating adolescent obesity as a chronic disease requiring longitudinal, multimodal care within the medical home, integrating nutritional support, physical activity, behavioral therapy, pharmacotherapy, and MBS as indicated.[4] Motivational interviewing - comprising four processes (engaging, focusing, evoking, and planning) - is recommended as a core component at all treatment levels.[12]

Concurrent treatment of obesity and related comorbidities is important: BMI reduction produces clinically meaningful improvements in cardiovascular risk factors, including systolic blood pressure, serum triglycerides, and HDL cholesterol.[1] Addressing weight stigma is essential, as stigma contributes to binge eating, social isolation, avoidance of health care, and reduced physical activity.[4] The AAP recommends person-first language (e.g., "child with obesity"), neutral descriptive terms, and recognition of complex genetic and environmental drivers of obesity.[4]

Special Populations and Health Equity

Treatment should be tailored to developmental stage: parent-focused, family-centered interventions for younger children; greater adolescent autonomy for older patients.[2,3] The Endocrine Society recommends intensive, age-appropriate, culturally sensitive, family-centered lifestyle modification for all age groups.[1]

Children with special health care needs - including developmental disabilities and autism spectrum disorder - have higher obesity prevalence and face unique treatment barriers; the AAP notes no evidence excludes these children from treatment, though interventions may require adaptation.[4] Obesity disproportionately affects children in poverty, racial and ethnic minority groups, immigrant families, and youth with adverse childhood experiences, reflecting structural racism and social determinants including inequalities in economic stability, education, and neighborhood environment.[3,4] Social determinants of health screening tools, such as the Accountable Health Communities Health-Related Social Needs Screening Tool, can help identify socially vulnerable patients.[4]

Long-Term Outcomes and Emerging Therapies

Long-term follow-up data underscore obesity's chronicity. The 2024 USPSTF systematic review found evidence on behavioral intervention effects beyond 1 year to be "exceedingly sparse".[10] For MBS, 5-to-8-year data show sustained weight loss and comorbidity remission, though approximately 8% of adolescent surgical patients regain at least 95% of initial weight lost by 5 years.[16] Ongoing multidisciplinary management is required to prevent relapse.

The pharmacotherapy pipeline continues to evolve. Dual GIP/GLP-1 receptor agonists such as tirzepatide have shown 15%–20% weight loss in adult trials, with adolescent data emerging.[15] Setmelanotide offers a targeted approach for genetic obesity syndromes including POMC deficiency, PCSK1 deficiency, leptin receptor deficiency, and Bardet-Biedl syndrome.[4] Future research should develop prediction models incorporating genetic profiling, phenotype, and psychosocial factors to enable precision obesity medicine.[15]

Implementation and Access to Care

Significant barriers limit implementation of effective obesity treatments. IHBLT access is constrained by workforce shortages, limited reimbursement, and infrastructure deficits in primary care. Semaglutide costs approximately $1,300/month, and most state Medicaid plans exclude anti-obesity medications.[3] While approximately two-thirds of private insurers and most state Medicaid plans cover adolescent MBS, a limited number of comprehensive adolescent bariatric centers restricts access for many eligible patients.[3] Payment reform, expanded training, electronic health record-integrated decision support, and community-level resource partnerships are needed to close the gap between guideline recommendations and real-world practice.[4]

Discussion and Conclusions

Childhood obesity is an expanding public health crisis requiring a chronic disease framework that integrates early identification, comprehensive comorbidity assessment, and a stepped, multimodal treatment pathway. Contemporary evidence supports family-centered IHBLT as the foundation of care, with pharmacotherapy and MBS as adjuncts for appropriately selected adolescents managed by multidisciplinary teams with long-term follow-up.

Across the prevention literature, single-component interventions have limited durable impact. School-based multicomponent programs combining physical activity, nutrition education, and structural changes show modest short- and medium-term BMI reductions, particularly when parents are engaged and programs span at least one full school year. Effects beyond 15 months are consistently limited, underscoring the need for sustained systems-level strategies.

Social determinants and structural inequities shape obesity risk and outcomes. Poverty, racism, food insecurity, and limited access to safe physical activity spaces drive disparities that cannot be resolved by individual behavioral counseling alone. Policy interventions addressing SDoH, combined with weight-stigma reduction and equitable access to evidence-based treatment, are essential.

Major implementation gaps persist: IHBLT capacity is insufficient; newer pharmacotherapies remain inaccessible due to cost and coverage gaps; and surgical centers are geographically limited. Long-term outcome data for behavioral, pharmacological, and surgical interventions are sparse, particularly in diverse and underserved populations. Future research should adopt equity-focused frameworks, standardize outcome measurement, and generate prediction models to enable precision obesity management.

Pediatric obesity demands a chronic, multimodal, and equity-informed approach. The convergence of updated clinical guidelines, expanding pharmacotherapy options, and evolving implementation science creates an opportunity to meaningfully improve outcomes if access, reimbursement, and structural barriers are addressed in parallel.

Conflict of Interest Disclosure

The authors declare no conflicts of interest.

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