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Counseling and Behavior Change in Pediatric Obesity

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Abstract

To effectively intervene with overweight and obese youth, it is imperative that primary care providers and behavioral interventionists work in concert to help families implement healthy behaviors across socioenvironmental domains (i.e., family/home, peer, community). As health care providers are often the first line of intervention for families, one critical component to implementing the socioenvironmental approach is to infuse intervention strategies into the primary care setting. In this paper, we review current office-based counseling practices and provide evidence-based recommendations for addressing weight status and strategies for encouraging behavior change with children and families, primarily by increasing social support. By providing such collaborative, targeted efforts, consistent health messages and support will be delivered across children's everyday contexts, thereby helping youth to achieve successful implementation of eating and activity behaviors and sustainable weight loss outcomes.

Keywords

pediatric obesity; socioenvironmental; office-based approaches; health care professionals; lifestyle interventions

The obesity epidemic has reached epic proportions in the United States (US).^{1,2} Approximately 70% of US adults³ and 32% of children are overweight or obese.¹ For children and adolescents, the Center for Disease Control and Prevention defines *overweight* as a body mass index (BMI: weight in kilograms divided by height in meters squared) between the 85th and 95th percentiles and *obesity* as a BMI at or above the 95th percentile for sex and age.⁴ The BMI scores and specified percentile distributions are easy and feasible

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to obtain and serve as indirect measures of body fat.⁵ Overweight and obesity are associated with chronic health conditions, heightened psychological distress, increased medical costs, and reduced quality of life.^{6–10} In fact, as children get heavier, their risk for health problems, such as metabolic syndrome and cardiovascular disease, directly increases, as well.^{6,11} Early intervention is essential, as elevated childhood height and BMI are robust predictors of young adult BMI,¹² and findings show that children with a BMI above the 85th percentile are more likely to continue to gain weight and to become overweight or obese in adolescence than normal weight children.¹³ While many assume that children will simply grow out of their overweight or obese status, the reality is that childhood overweight and obesity are critical risk factors for overweight and obesity in adulthood,¹⁴ and risk of developing obesity later in life increases with child age and BMI.^{13,14} The tendency for overweight or obesity to track across the lifespan starts as young as 9 months and necessitates early intervention, as pediatric overweight and obesity do not spontaneously resolve with age.^{15,16} List 1 provides key reasons why childhood is an ideal point of intervention;¹⁶ in fact, even small weight loss reductions are sufficient for overweight and obese children to satisfy criteria for normal weight.¹⁷

The US Preventive Task Force recommends that overweight and obese children receive specialty treatment of moderate-to-high intensity that includes counseling and other interventions to target diet and physical activity; in addition, parents are expected to play a pivotal role in treatment.¹⁸ A collaborative effort between primary care providers (PCPs) and behavioral interventionists is necessitated to provide consistent health messaging and support for successful weight loss and prevention of excess weight gain. Finally, social support is the ultimate driver of sustainable behavior change; it is imperative to promote social facilitation within interventions for pediatric obesity.

The purpose of this paper is to 1) discuss current practices and limitations for weight loss intervention in health care settings; 2) describe family-based behavioral interventions and outcome predictors; 3) review successful behavior change strategies for weight loss maintenance and the components of family-based behavioral interventions applied within a socioenvironmental approach; and 4) discuss recommendations for how to best utilize the office environment as a critical point for obesity prevention and treatment across socioenvironmental domains.

Overview of office-based counseling approaches: Current Practices

Extending pediatric obesity interventions into common practice relies on identification of settings in which effective programs can be integrated. The health care office environment is ripe for intervention deployment, as PCPs routinely meet with children and families, can screen for obesity and heightened weight status, and are often the first line of care. In 2003, the American Academy of Pediatrics (AAP) published expert guidelines for the screening and monitoring of pediatric obesity.¹⁹ This report encourages PCPs to track BMI percentile and promote healthy eating and activity behaviors. In 2007, the guidelines were updated with more intensive recommendations for obesity treatment and prevention.⁵

A significant proportion of PCPs report being unaware of these guidelines²⁰ or do not report regular implementation.²¹ Some providers are able to incorporate the recommendations into practice,²¹ especially following training,²² although it is unclear whether PCPs sustain these behaviors in the long term.²³ Among PCPs who used current criteria for identifying overweight or obese children, many reported concerns that they lacked adequate skills to address the problem,²⁴ their counseling was ineffective, or adequate treatment strategies do not exist.^{21,25–27} One study found that nearly all PCPs used visual assessment to determine children's obesity status, but only half actually computed BMI percentile.^{21,26} Results from

a separate survey revealed that the majority (71%) of PCPs engaged in discussions with families about increasing overweight or obese children's healthy behaviors, but few (19%) provided families with the necessary tools to implement the changes, although only a limited number of providers followed up with families about their behavior changes.²⁴ Finally, in studies that report on children's weight change outcome as a result of brief provider counseling, findings generally point to nonsignificant reductions in BMI.²⁸⁻³¹

However, despite a lack of weight change, some PCP interventions have led to increased healthy behaviors (e.g., improved nutrition and physical activity patterns).^{32,33} In sum, there is promise that PCPs are able to successfully incorporate behavior change principles into practice; given that effective intervention methods have been established but not implemented into routine care, there is a need for a more targeted, intensive approach that unifies families, providers, and behavioral interventionists.²²

Understanding motivation in parents

Identifying families in need of intervention, connecting them with appropriate services, and checking on their progress represent central roles of PCPs. To maximize the integration of care across settings, it is ideal for PCPs to engage parents in conversations to assess their motivation and to evaluate their current needs and resources.

Given their crucial role in child weight loss success, it is important to address parents' confidence in their ability to do well in a weight loss intervention.^{34,35} *Gaining an understanding of parent motivation may be particularly relevant for PCPs, as some rate "lack of parental involvement" as a common barrier to pediatric obesity treatment.*²⁴ A recent study assessed three components of motivation: readiness (to change a specific behavior), importance (of making the change), and confidence (in their ability to make the change).³⁴ Parental confidence was the strongest predictor of treatment completion and child weight loss. Braet and colleagues showed that parents' motivation at baseline predicted treatment completion.³⁵ Additionally, an intervention designed to increase and maintain motivation for continued weight loss behaviors was efficacious.³⁶ Thus, it may be useful to assess and increase parents' motivating factors to optimize their likelihood of completing treatment and losing weight; motivational interviewing skills (e.g., reflective listening and a non-judgmental stance) can be used to help individuals assess the benefits and drawbacks to a decision and make a positive choice towards behavior change.

Specifically, providers can talk with parents to learn what is reinforcing to them about losing weight and their ability to implement the intervention strategies.³⁷ Questions such as, "What concerns do you have about your family's ability to implement healthy behaviors in the home?" can help parents to articulate their motivation and readiness for participation in a weight loss intervention.⁵ Second, providers are encouraged to help parents to map out a network of support by identifying individuals in their social circle, as well as peers and caretakers in their children's social circle, who will support or possibly hinder their weight loss efforts. Capitalizing on supportive resources will be helpful to families in the long term. Finally, it is important to discuss potential barriers to treatment success with parents (e.g., busy schedules, lack of motivation, previous weight loss failures). This dialogue will identify strategies to increase and maintain families' motivation throughout the intervention.

Predictors of sustainable behavior change for pediatric obesity

Once providers identify families in need of intervention, it is imperative to choose effective intervention strategies, as well as to consider specific factors that predict outcome.

Family-based behavioral lifestyle interventions

Lifestyle interventions are active treatments that modify overweight and obese children's daily practices (e.g., improved dietary intake and physical activity); by capitalizing on daily living, behavior changes are better sustained over time.³⁸ A lifestyle intervention utilizes an organic strategy in which behavioral goals are tracked and made progressively more comprehensive, and families learn to problem-solve barriers. Providers can encourage patients to meet with a specialist and participate in a behavioral weight loss program that emphasizes weekly monitoring, skill-building, goal-setting, and evaluating progress over time. Such a comprehensive approach is in contrast to an education-only intervention condition, in which information is presented to families to help them make changes. Numerous randomized controlled trials (RCTs) and meta-analyses have shown that active lifestyle interventions are superior to no-treatment control or education-only conditions³⁹ (Table 1). A recent meta-analysis found that lifestyle interventions yield an average decrease in percent overweight of 8.9%, compared to education-only controls that yield an average increase of 2.7% at follow-up.³⁹

Family-based behavioral weight loss treatments (FBTs) are lifestyle interventions that are typically regarded as the first line of treatment for childhood overweight and obesity due to their empirically-demonstrated efficacy⁴⁰⁻⁴⁶ and relative safety, compared to pharmacotherapy or bariatric surgery.⁴¹ Recent work indicates that children receiving a multi-component FBT demonstrated significant decreases in percent overweight and improvements in related comorbidities, whereas those receiving usual care did not exhibit changes in percent overweight.⁴⁷ Furthermore, positive outcomes of FBT are not limited to changes in child weight; this approach produces significant reductions in blood pressure and cholesterol levels,⁴⁸ as well as psychosocial health benefits.⁴⁹⁻⁵¹

The importance of parental involvement

The rationale for parental involvement in treatment is two-fold. Parental obesity has been identified as a significant risk factor for childhood obesity,⁵² with one study reporting that children with obese parents are at a two- to three-fold increased risk for being obese themselves in adulthood.¹⁴ This concordance of parent-child weight status, likely due to shared genetic and environmental factors, suggests a strong parental influence on the weight status of their offspring and could have a powerful positive impact in FBTs. Secondly, FBTs recognize that the children's weight-related behaviors are developed and maintained within the context of the family;⁵³ therefore, lifestyle interventions aim to capitalize on the influence parents can employ over the weight-related behaviors of their young children and the structure of the family environment.^{54,55}

Parents or caregivers are necessary partners in pediatric weight loss^{55,56} due to their role as key agents of change and the impact of parent behavior change on child weight outcomes. Parents are conceptualized in a "helper" or "facilitator" role and taught to encourage children to exercise and make healthy choices, as well as to modify the shared home environment.⁵⁴ Parental involvement is supported by behavioral economics theory, which suggests that individuals will choose behaviors that are less effortful and highly reinforcing. Therefore, inducing child behavior change is contingent upon parents providing healthful, reinforcing alternatives while limiting access to less healthy options. Social cognitive theory⁵⁷ also provides a strong argument for parental inclusion in treatment, as it posits that modeling is a potent contributor to intervention success because children learn through observing their parents' behaviors. In addition, the benefits of parents and children modeling healthier behaviors in the shared home environment may generalize to at-risk siblings.⁴² Overall, harnessing parental influence has the potential to improve the weight status of the entire family by creating an environment that supports healthy lifestyles. In summary, the

most effective interventions for pediatric obesity incorporate multiple components and hinge upon parental involvement.

In addition to utilizing the evidence-based approaches shown to elicit successful weight loss in youth, it is important for providers to be mindful of key factors that predict sustainable behavior change and address them accordingly (see Table 2).

Early Treatment Response for Children

Sustainable behavior change is associated with early treatment response; specifically, recent work highlights that children who lose weight by week eight of a weight loss intervention have the greatest likelihood of sustained success.⁵⁸ It is important for providers to encourage weight loss early in the intervention to maximize the potential for long-term success.

Treatment Response for Parents

Children whose parents respond to treatment are more likely to perform well in a weight loss intervention.⁵⁹ Parents and caregivers play a pivotal role in treatment success,⁶⁰ in that they serve as role models and are most often in charge of household decisions; they have the greatest capacity to implement treatment strategies and provide stimulus control.⁶¹ Thus, providers will ideally encourage parents and caregivers to actively engage in their own healthy behavior changes along with their children to ensure that children are receiving optimal support for healthful eating and activity.

Social Functioning

Heightened social problems (e.g., loneliness, jealousy, susceptibility to teasing) predict greater weight regain after FBT.⁶² In addition, children with higher levels of social problems evidence poorer weight loss maintenance.⁶³ Youth who experience social problems or rejection may be more likely to use food as a coping mechanism⁶⁴ and less likely to engage in physical activity.⁶⁵ Obese children are less likely to join teams and physical activities and are more likely to experience concerns about physical competence⁶⁵ and be perceived as less athletic than non-obese peers.⁶⁶ Identifying children with social problems will allow providers to effectively tailor treatment goals, as well as help families to develop social support for sustainable behavior change.⁶³

Built environment

Specific aspects of the built environment are associated with increased rates of obesity, including limited accessibility to parks and open spaces and increased accessibility to fast food restaurants.^{67,68} Recent research suggests that the built environment impacts children's weight loss success in FBTs; access to parks and open spaces predicted greater weight loss success at two-year follow-up, whereas reduced access to parks and greater access to supermarkets and convenience stores predicted poorer outcome⁶⁹. Thus, it is important for providers to consider the built environment when identifying intervention goals and determining how to best capitalize on available resources.

Appetitive Traits

When examining predictors that enhance sustainability, it is equally important to consider factors that increase vulnerability to weight gain and therefore may be barriers to weight loss. Appetitive traits, such as poor satiety responsiveness,⁷⁰⁻⁷² high food reinforcement,⁷³ binge or loss of control eating,^{74,75} and impulsivity,⁷⁶ are heritable factors associated with increased energy intake, excess weight gain, and obesity risk among youth and adults.^{24,77-86} The presence of these traits may hinder treatment response, and as a result, addressing these weight-related liabilities through early detection and targeted intervention

is critical. The primary mechanism for addressing these traits is training parents to help their children by shifting the environment and teaching them critical skills related to eating. Overall, PCPs should encourage parents of children who have difficulties in these domains to help their children to 1) regulate their portion sizes; 2) delay gratification for food (e.g., limit access to unhealthy foods to decrease temptation); 3) differentiate between hunger and emotional states; and 4) seek alternate activities other than eating if they are not hungry. Using stimulus control will enhance children's potential for success, as well.

In sum, encouraging early treatment response and parent response, inquiring about social functioning and associated problems, capitalizing on resources in the built environment, and identifying and targeting appetitive traits will maximize treatment success and the long-term sustainability of these results. The presence of any of these factors indicates vulnerability for continued weight gain and need for higher intensity treatment; providers are encouraged to increase the frequency of visits for families who present with these identified factors.

Behavioral modification techniques that work across the socioenvironmental contexts

Intervening within a socioenvironmental framework

Interventions that utilize a socioenvironmental approach are efficacious for weight loss because they extend the focus of behavior change beyond the individual to encompass the home, peer, and community contexts.⁸⁷⁻⁸⁹ Interventions are most potent when embedded within the contexts of parents and children's lives (i.e., where they live, learn, play), and when they devote sufficient time to the mastery and practice of strategies for implementing healthful behaviors.⁹⁰ Given the ease with which old behavior patterns are cued, interventions need to be intensive enough and facilitate repeated practice across contexts so that newly-learned patterns become ingrained and entrenched.

Unhealthy eating and activity patterns have increased, and rapid changes in our diet over the past 200 years have led to significant increases in consumption of highly-processed foods and refined grains, sugars, and fats.⁹¹ Messages encouraging unhealthy choices are ubiquitous in our culture, such that children are barraged with obesogenic cues. Children repeatedly see billboards for fast food, walk near desserts for lunch in the cafeteria, and receive packaged sweets and juice after sports games. Promotion of physical activity has decreased: excluding gym class from the curriculum is a common response to budget cuts and the convenience of handheld video game devices gives way to increased sedentary activity. Given the myriad environmental prompts, weight loss is an uphill battle; individuals may be able to lose weight, but they often have difficulty sustaining these effects.⁹² Thus, the cross-contextual approach of the socioenvironmental model optimizes treatment success because it addresses eating and activity cues and behaviors across contexts and brings the family and social network together to support individuals as they make healthy behavior changes. For example, parents aiming to increase the availability and range of healthy meal options would first be prompted to have a conversation with their children and family members about offering healthy meal options at home. Parents would then be encouraged to talk with friends about serving healthy meal options during get-togethers with their children or themselves. In addition, parents would be advised to advocate with co-workers so that healthy meal options are offered in office settings and with school teachers so that healthy meal options are served in the classroom. Finally, parents would be encouraged to solicit support from organizers of community events (e.g., Girl/Boy Scout troop leader, person responsible for food after a community-based run) to offer healthy food options. This example of comprehensive support across levels demonstrates how families may maximize opportunities for increasing healthy default options. As families become

more adept at implementing these strategies, they become increasingly empowered to extend their healthy behaviors into new situations.

In a standard behavioral weight loss intervention, the treatment emphasis and responsibility for behavior change are placed solely on the individual. The socioenvironmental model increases the duration and extends the scope of standard behavioral weight loss treatment by focusing on practicing skills and infusing support across contexts. This framework encourages behavior change via continued practice of newly-learned behaviors throughout a variety of settings. In standard behavioral weight loss intervention, individuals are encouraged to increase their daily physical activity (e.g., go for a run); the socioenvironmental approach builds on this by promoting that individuals engage in physical activities such as joining sports teams at school, doing physical activity fitness classes with friends, and training for community-based runs (e.g., 5-kilometer events) with their family. Beyond relying on individual willpower and self-regulatory skills, utilizing the socioenvironmental framework promotes an increased awareness of environmental cues and advocacy for making sustainable healthful changes. For instance, parents will be able to recognize that their usual drive home contains many fast food restaurants that prompt their children to ask for snacks and will be able to select an alternate route to avoid the prompts altogether. Recent evidence supports this approach as a strategy to achieve sustainable weight loss in children and adults.^{63,87,88,93} Given that weight regain is common following standard treatment,^{92,94,95} efforts to reverse the obesity epidemic hinge on incorporating these targets into weight loss interventions.

In the first assessment of the socioenvironmental model delivered in a family-based format, Wilfley and colleagues found that this approach, based on social facilitation of healthy behaviors, was associated with sustained weight loss compared to a behavioral weight loss intervention and control condition.⁶³ More recently, biosimulation modeling revealed that an intervention with a socioenvironmental framework of increased duration (e.g., 1 year) will likely yield better weight loss maintenance over the long term.⁹³

The application of the socioenvironmental intervention in clinical settings will provide necessary encouragement of healthful behaviors so that children receive more integrated messages and support for weight loss.⁹⁶ Given their role in treating children and discussing health-related targets with families, providers can work in concert with public health and community initiatives to educate, support, and follow up with families about behavior change implementation. The breadth of the obesity epidemic warrants that individuals across the health care profession actively engage in interventions to combat this problem.

Applying the socioenvironmental approach

Several behavioral modification techniques are effective in promoting healthy weight control within each context across the socioenvironmental domains (i.e., family/home, peer, and community). List 2 provides recommendations from the AAP regarding PCP behaviors to implement within the primary care setting, as well as specific energy balance behaviors for PCPs to recommend to families.⁵ As health care offices infuse these changes in routine clinical practice, it is recommended that an evaluation system becomes established to measure how effectively providers are incorporating these changes.

Figure 1 depicts specific health behaviors across the socioenvironmental domains that PCPs can help families to implement. Although these strategies focus on pediatric approaches, they are applicable across the age spectrum. As families begin to infuse these changes across their everyday contexts, providers should remind parents and children that progress may be gradual. Supportive, yet persistent, monitoring and praise will help families continue to stay on track with their behavior change goals.

Family/Home Context

The socioenvironmental approach encourages families to implement behaviors and solicit social support in each relevant context. Table 3 provides a detailed list of specific behaviors providers can discuss with parents to facilitate sustainable weight loss. Within the family/home context, it is critical for families to monitor their eating and activity behaviors. Full monitoring, or the use of food and exercise diaries to document energy consumption (i.e., caloric intake) and energy expenditure (i.e., 10-minute bouts of activity), is helpful for identifying current behaviors and determining areas for improvement. Awareness is crucial for behavior change; for instance, full monitoring will reveal sources of excess energy intake or misconceptions about the healthfulness of the foods consumed, thereby allowing clinicians and families the opportunity to alter these behaviors.

Weight loss is achieved during a state of negative energy balance, or when energy expenditure is greater than energy consumption. As described in List 1, healthy eating behaviors, such as increased fruit and vegetable consumption and decreased portion sizes, as well as improved activity patterns are key components of effective weight control interventions.⁹⁷ Given that providers have limited time in session to distill information to families, easy-to-explain tools are helpful, particularly for children. For example, the Traffic Light Plan (TLP)⁴⁹ is a user-friendly guide that codes foods and activities into RED, YELLOW, or GREEN categories. The TLP encourages children and families to limit RED foods, which are low-nutrient, energy-dense foods high in fat and/or sugar, and RED activities, which are sedentary behaviors that do not burn calories (e.g., “screen” time leisure activities, such as watching television, playing videogames, talking/texting on the phone, or using the computer). Furthermore, the TLP promotes the replacement of RED foods and activities with GREEN foods, which are healthful, nutrient-dense foods low in fat and calories, and GREEN activities, which are moderate-to-intense physical activities).

Another critical monitoring skill to promote within the *family/home* context is regular weighing (e.g., at the same time each week) to keep track of the families’ weight trajectory. Weight measurements provide important, objective data regarding their recent behaviors. Families can also get into the habit of having conversations about connecting behaviors to weight change, which is an important, evaluative skill.

To help children achieve a negative energy balance, parenting behaviors are crucial. It is recommended that providers work with parents to routinely implement the following strategies:

1. **Modeling:** Parents demonstrate how to make healthy choices and thus serve as models to their children, family members, friends, and community members.
2. **Stimulus Control:** It is necessary for parents to remove prompts for unhealthy foods and activity equipment (e.g., removing chips and cookies from the home or from within easy reach for children, keeping videogame equipment on a high shelf in the closet) and increase the availability of prompts for healthy foods and activity (e.g., placing fruits in a basket on the kitchen counter, keeping sneakers by the door) in the home.
3. **Limit-Setting.** Parents can set house rules to target reduction of specific behaviors, such as amount of unhealthy foods consumed or time spent watching television. This structure helps families to establish healthy patterns around eating (e.g., planning for and eating breakfast, lunch, dinner, and 1–2 snacks every day), activity (e.g., incorporating a daily walk after dinner), and sleep (e.g., setting “electronic curfews,” the time by which all electronics must be turned off, and bedtimes).

Clinical skills also include helping parents to problem-solve barriers to behavior implementation and identify plans for high-risk situations (e.g., an upcoming birthday party that will only serve unhealthy foods). In addition, it is important to recommend to parents that they establish a “no tolerance” policy for teasing and an open environment for healthful discussions about body image, as these represent common issues for overweight or obese youth.^{8,66,98–101}

Inherent within behavior modification strategies is the identification of goals. Providers can help families accomplish their goals consistently by encouraging them to establish a system of reinforcement. Use of a behavioral rewards system is effective for reinforcing weight loss and attainment of healthy behaviors.¹⁰² However, it is important to ensure that reinforcement patterns encourage healthy behaviors, as this is not always the case. For instance, when parents reward children with dessert or only spend time with them while watching television, they are reinforcing unhealthy choices. Instead, explaining to parents that they should reward children with alternate, non-food reinforcers (e.g., activities they like to do or social events, such as going swimming, instead of candy or television shows) will promote the implementation of healthful behaviors. Praise is also a powerful reinforcer for positive behaviors. Thus, PCPs are encouraged to remind families to use reinforcement techniques to replace unhealthy behaviors with healthier options, which will ultimately help them to establish sustainable changes.

Peer Context

The peer context provides unique opportunities for intervention, given that friends are important sources of social support, both as models of healthy eating and sources of alternate reinforcement. Studies demonstrate that overweight and obese children are more likely to make healthy eating choices when they are with peers who make healthy choices.^{103–105} In addition, spending time with friends is a viable alternative to other types of reinforcers, including eating unhealthy foods.¹⁰⁶ To reduce the amount of food children eat and provide an alternate reinforcer, providers should encourage parents to schedule active, healthy get-togethers with their children’s peers, capitalizing on friendships with peers who already do healthy behaviors. Clinicians can also help families to develop advocacy plans for peers, such as only serving healthy options at events and asking friends to make healthy foods, as well. As is critical within the family/home context, providers should recommend to parents that they promote a healthy environment with friends in terms of teasing (e.g., establish a “no tolerance” policy for teasing).

Community Context

Within the community context, families should be encouraged to utilize available resources and advocate for improved healthful options. For instance, clinicians can help families to become aware of neighborhood facilities and services, such as through the local community center, that promote healthy behaviors. Joining a physical activity-oriented team or club offers multiple benefits, including increased time spent being physically active, identification of a network of peers who engage in physical activity that is of interest to the child, and development of an alternate reinforcer to eating or sedentary behavior. Families should be encouraged to avoid unhealthy restaurants (e.g., fast food) or other venues in which it is difficult to make healthy choices. As families become more skilled in implementing these changes, they should also be encouraged to advocate for healthful changes in the local community regarding eating (e.g., serving skim milk at school or low-fat deli sandwiches at work) and activity (e.g., vigorous intensity games during gym class or access to stairs in addition to elevators). By developing support for healthy options throughout the community, families optimize their local resources and are better able to maintain healthy weight control habits.

Using the office environment and resources to promote obesity prevention

In effective lifestyle interventions, parents and children work with a behavioral specialist and attend regular treatment sessions, with options for phone sessions and email check-ins interspersed throughout the intervention. Families participate in group (45 minutes) and individual (30 minutes) sessions during each appointment; this format provides families with peer support through the group setting and a tailored intervention via the individual sessions. To optimize support in the home, additional family members are encouraged to attend as well.

Though these effective interventions have been established, recommended practices have not been implemented into routine practice. Thus, it is critical to extend beyond traditional settings and have providers work in concert with behavioral interventionists to provide integrated care and reinforce messaging across contexts. For instance, providers are in a prime position to identify at-risk families and make referrals for specialized weight loss intervention. Providers can then follow up with families once every three months to regularly track children's health outcomes. Finally, providers can support the behavioral interventionists in establishing a unified treatment program for families by facilitating parents' use of community resources and encouraging children's development of positive social ties. Such collaborative effort is necessary to most effectively promote healthy behaviors, address families' weight trajectories, and eliminate obesity.

Optimally, office policies and practices will ensure that staff members are equipped to confront weight-related problems. It is important for staff to be educated in behavior change principles so that they gain an understanding of how to help families to implement healthy strategies in their homes and communities. Office-based trainings can include the importance of early intervention, with instruction on how to appropriately and effectively intervene with parents and children and provide referrals.²³ In addition, it is advantageous for staff to be educated in diversity awareness, as cultural differences may impact families' values regarding weight status, body ideals, and parenting behaviors, and socioeconomic barriers (e.g., family finances and spending practices; access to community resources) may affect the intervention strategies that families are willing or able to implement. Ideally, providers will learn families' stances on these issues to tailor their recommendations appropriately. Ongoing training and supervision in stigma awareness and reduction may be of benefit, as well.

Concerted efforts to 1) reduce providers' skepticism regarding the efficacy of weight loss interventions; and 2) increase reimbursement for the provision of obesity-related services, will increase the likelihood that providers will engage families in weight loss interventions.²³ Offering CME training opportunities, making accessible medical journals (e.g., *Pediatrics*), and increasing access to medically-relevant websites (e.g., AAP, CDC) are useful avenues for increasing providers' knowledge of AAP recommendations.²¹

When addressing weight-related problems with families, it is imperative for staff to remain empathetic and utilize reflective listening. Ideally, staff will be trained to engage in open discussion with families about making healthy eating and activity changes, particularly as discomfort surrounding these conversations is a reported barrier for providers to address this issue.²³ These conversations typically focus on understanding a family's health behaviors, as well as their social network, with the goal of identifying sources of support for making healthy changes. Skills clinicians will teach to families include: how to engage in healthy eating; meal planning; and self-monitoring; and the tools for implementing these changes across the socioenvironmental contexts.

As mentioned above, the regularity of doctor's appointments places PCPs in an ideal position to track and monitor children's progress over time. Structuring appointments to allow time to calculate children's BMI, review their weight trajectory, and discuss families' progress in implementing healthy strategies will optimize intervention. Routine assessment of metabolic profiles and tracking risk for obesity-related health consequences is also imperative; this recommendation is in line with the AAP guidelines for addressing pediatric obesity.^{5,19} It is crucial for staff to engage families about their weight goals and help families to problem-solve potential barriers. Discussing ways to maintain social support or seek avenues for developing healthy social ties is encouraged, as well. Overall, it is important that sessions focus on increasing families' skills for at-home implementation of behavior change strategies.

Finally, it is recommended for obesity prevention that providers calculate BMI and address weight status with all families. Providers are encouraged to talk with parents of children who are normal weight to confirm whether they are currently engaging in healthy eating and activity behaviors; PCPs can promote the implementation or maintenance of these practices as needed and address any areas of concern to prevent the development of obesity. Noting family histories of overweight or obesity, obesity-related health problems, or gestational diabetes mellitus will help providers to screen for children at elevated risk for obesity. By using a universal approach, providers encourage healthy eating and activity practices and reduce risk for excessive weight gain among all families.

Promoting healthy lifestyles does not need to be limited to conversations between health professionals and patients; the office environment itself provides substantial opportunities to promote healthy lifestyle behaviors by making healthy resources and relevant prompts accessible and visible. First, offices can promote healthy lifestyle activities, such as emphasizing the use of stairs, increasing office walkability, and making breastfeeding rooms accessible. Second, healthy eating can be encouraged by removing vending machines, providing water fountains, and enforcing healthy standards for office meals (e.g., healthy staff lunches). Third, prompts for healthy local events and resources, such as farmers markets and community events for running, walking, or biking, can be made available in waiting rooms and hallways. It would be ideal for take-home materials with strategies for implementing behavior change to be made accessible. Finally, staff can set a positive example by modeling healthy behaviors (e.g., by not making unhealthy food visible, drinking water, walking during lunch breaks). In doing so, families receive consistent, healthful messaging that extends beyond the appointment session, in that the office environment models the infusion of healthy prompts across contexts.

Conclusions and future directions

The pressing pediatric obesity epidemic warrants immediate attention and a collective effort across health care professionals. This paper provides an overview of current PCP counseling practices, evidence-based recommendations for addressing pediatric obesity and eliciting behavior change, and encouragement to providers to implement these strategies in the primary care setting to help children lose weight and prevent excess weight gain.

By intervening early, providers are in a prime position to help families instill healthy habits. The earlier the intervention, the more potent providers can be: for instance, it is less likely that children become obese if parents never get into the habit of giving soda to their children.

Importantly, awareness of the discussed strategies represents only the first step. Implementing these changes *with every family, at every visit*, is critical for curbing the widespread problem of pediatric obesity. Researchers and clinicians must establish ongoing,

open communication about the adoption of behavioral interventions and methods for training health professionals in these strategies. Future work is required to determine the optimal way to connect community resources to health care settings, including the use of social media and online forums for intervention. Building collaborative partnerships provides consistent health messaging and establishes greater referral services, thereby enhancing opportunities for families to embed healthy behaviors across all areas of their lives. Researching models and utilizing stakeholder (e.g., PCP) input on how best to disseminate this work lays necessary groundwork for widespread implementation. Through the employment of behavior change strategies into everyday clinical practice, providers will be in prime position to affect sustainable weight loss outcomes and promote healthier youth.

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Provide within the manuscript a brief summary of important points and objectives for recall:

- Family-based behavioral lifestyle interventions utilizing a socioenvironmental approach produce sustainable weight loss
- Ideally, providers will be actively engaged in tracking children's body mass index trajectory and addressing obesity with families
- By employing the socioenvironmental approach, providers can ensure that children receive consistent health messaging and encourage families to implement healthy eating and activity behaviours across contexts

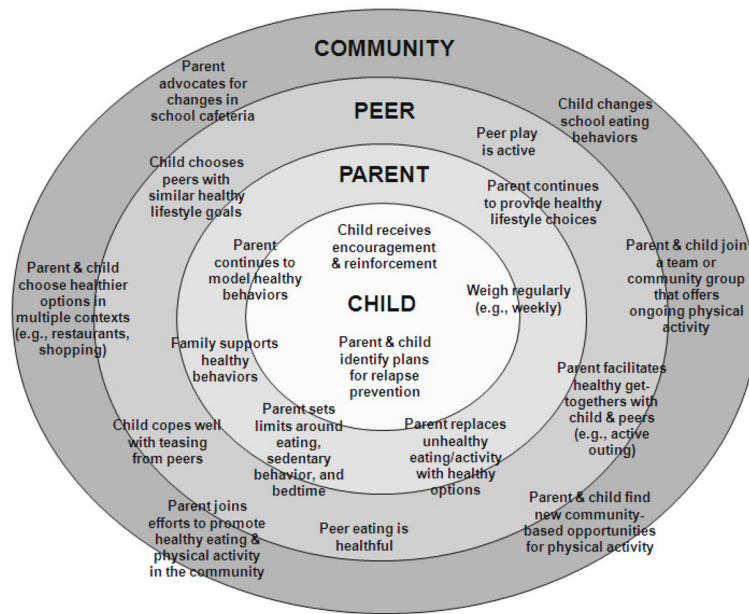


Figure 1. Socioenvironmental model and recommendations for providers to make across domains.

Table 1

Recent reviews and meta-analyses of pediatric weight loss studies

Author	Type of Review and Number of Studies	Target Population	Conclusions
American Dietetic Association (2006)	Review of 29 RCTs and 15 other types of studies	Overweight children (ages 2 through 12) and adolescents (ages 13 through 18)	Positive effects for multi-component, family-based programs especially for children ages 5 through 12
Latzer et al. (2008)	Review of 80 articles	Overweight children and adolescents (ages 2 to 19)	Behavioral modification strategies have a modest, short-term efficacy; family and parents improve treatment outcome
McGovern, et al. (2008)	Meta-analysis of 61 randomized trials	Overweight children and adolescents (ages 2 to 18)	Small to moderate treatment effects of combined lifestyle interventions on BMI
Snethen et al. (2006)	Meta-analysis of 7 interventions	Overweight children (ages 6 to 16 with an overall mean age not older than 12)	Multi-component lifestyle interventions that include parental involvement can be effective in assisting children to lose weight
Tsiros et al. (2008)	Review of 34 RCTs	Overweight or obese adolescents (ages 12 to 19)	Lifestyle interventions with behavior/ cognitive- behavioral components are promising particularly for long-term maintenance
Wilfley et al. (2007)	Meta-analysis of 14 RCTs	Overweight youth (ages 19 or younger)	Lifestyle interventions produce significant changes in weight status in the short-term with encouraging results for the persistence of effects

Table 2

Specific predictors of sustainable behavior change.

Predictor	Intervention Target
Children's Early Treatment Response	<ul style="list-style-type: none"> • Encourage early weight loss (i.e., by week 8 of the intervention)
Parents' Treatment Response	<ul style="list-style-type: none"> • Promote parental behavior changes and weight loss • Discuss strategies for restructuring the home environment to maximize healthful options
Social Functioning	<ul style="list-style-type: none"> • Evaluate social skills and identify target areas (e.g., making friends, coping with teasing) • Encourage parents to set up healthy, active get-togethers with peers and facilitate their children's social skill development
Built Environment	<ul style="list-style-type: none"> • Identify specific aspects of the built environment that may promote (e.g., parks, open spaces) or hinder (e.g., fast food restaurants) weight loss success • Determine how to capitalize on available resources or develop plans to increase access to healthful resources
Poor Satiety Responsiveness	<ul style="list-style-type: none"> • Encourage parents to replace unhealthy food/activity with healthy options • Discuss how to increase awareness of hunger/satiety cues • Promote meal regularity and healthy meal patterns
High Food Reinforcement	<ul style="list-style-type: none"> • Discuss the importance of eating only when hungry • Identify alternative sources of reinforcement • Encourage parents to limit access to unhealthy foods
Binge or Loss of Control Eating	<ul style="list-style-type: none"> • Encourage parents to regulate eating patterns • Facilitate improvement of emotion regulation skills and body esteem • Identify ways to enhance supportive interpersonal relationships as alternatives to food
Impulsivity	<ul style="list-style-type: none"> • Discuss how to improve self-control and planning skills • Use stimulus control: maximize access to healthy foods and minimize access to unhealthy foods and sedentary behaviors

Table 3

Parental involvement in family-based behavioral interventions

Supporting Healthy Eating Behaviors	Supporting Physical and Lifestyle Activity	Supporting Healthful Behavior Change
<p><u>Increase low-energy density foods</u></p> <ul style="list-style-type: none"> Plan for healthy meals Shop for nutritious foods (fruits, vegetables, “good” fats, high fiber) Prepare healthy meals Serve fruits and vegetables at meals and for snacks <p><u>Decrease high-energy density foods</u></p> <ul style="list-style-type: none"> Limit high-energy density foods in the home Limit access to fast food restaurants Limit eating away from the kitchen and dining room Replace sugar-sweetened beverages with water or serve low-fat milk products at home <p><u>Improve meal patterns</u></p> <ul style="list-style-type: none"> Establish the routine of 3 meals and 1–2 planned healthy snacks/day Serve healthy portion sizes Involve child in preparing meals Cook traditionally unhealthy foods in a healthier way (e.g., baking instead of frying) 	<p><u>Increase physical activity</u></p> <ul style="list-style-type: none"> Make a weekly activity schedule Provide equipment and clothing for exercise Set up active play dates with child’s peer group Join a local community recreation center Use local parks and playgrounds <p><u>Increase lifestyle activity</u></p> <ul style="list-style-type: none"> Plan fun activities for the family Model for and encourage children to take the stairs instead of escalators or elevators Walk instead of drive with family, when possible <p><u>Decrease time spent in sedentary behaviors</u></p> <ul style="list-style-type: none"> Limit child’s TV and computer time to 2 hours/day 	<p><u>Use behavior modification strategies</u></p> <ul style="list-style-type: none"> Set goals for weight and behavioral change targets Create a family-based rewards system Engage in self-monitoring and logging Use stimulus control strategies in the shared home environment <p><u>Target changes in the parent</u></p> <ul style="list-style-type: none"> Focus on weight loss in parents Model healthful behaviors for child <p><u>Provide support for child</u></p> <ul style="list-style-type: none"> Hold family meetings Review self-monitoring logs Praise healthy behaviors Encourage healthy behaviors, and minimize attention to unhealthy behaviors Explain the family-based behavioral intervention to family and friends Solicit support from family and friends to maximize prompts for healthy eating and activity across contexts