

# The Role of Optimal Healing Environments in the Management of Childhood Obesity

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## ABSTRACT

The prevalence of childhood and adolescent obesity has increased steadily over the past three decades such that obesity is now a major worldwide pediatric health risk factor. Pediatric obesity is associated with significant health problems, and is an important early risk factor for adult morbidity and mortality. This paper focuses on the role and components of optimal healing environments (OHEs) that may be useful in the management of childhood obesity: healing intention, healing relationships, health promotion and disease prevention, and healing spaces. Diet, physical activity, and behavior modification strategies used in the treatment of childhood obesity are also reviewed.

## INTRODUCTION

The prevalence of childhood and adolescent obesity has increased steadily over the past three decades such that obesity is now a major pediatric health risk factor, not only in the United States but worldwide.<sup>1,2</sup> Key venues for implementing childhood obesity interventions include the home, school and primary care settings. Educating parents on eating and lifestyle modification significantly reduces the prevalence of obesity in their children.<sup>3</sup> Holding classroom lessons on nutrition and physical activity improves indices of fitness and body fat levels.<sup>4</sup> The delivery of programs through primary care has received little formal assessment, and its potential role seems to be undervalued and underused.<sup>5</sup> Although all three settings may be part of an optimal healing environment (OHE), we have chosen to focus on the role of the health care provider, working with patients and their families, to prevent and treat childhood obesity.

Health care providers, in conjunction with their patients (and other family members), form the therapeutic alliance. This alliance is an important component of healing in health care settings<sup>6</sup> and falls under the category of healing relationships as defined by the Samueli Institute.<sup>7</sup> In an OHE, healing relationships may occur in nonclinical social supportive interactions and/or the therapeutic alliance. With re-

spect to childhood obesity, social supportive interactions may include family members, friends, support groups (clubs, camps, both for children and parents), school and after-school environments (including recreational activities), religious institutions, and the community at large. The therapeutic alliance includes the doctor and nurse–patient/family relationship.

We hypothesize that the therapeutic alliance can play an important role in prevention, treatment, and management of childhood obesity. The American Academy of Pediatrics strongly advocates support for development and testing of primary prevention strategies for the primary care setting, and investment of substantial resources for development of effective treatment approaches.<sup>8</sup> Although there is a paucity of published research in this area, we believe that navigating through these relatively uncharted waters may lead to innovative approaches to managing this serious issue.

## ASSESSMENT OF OBESITY

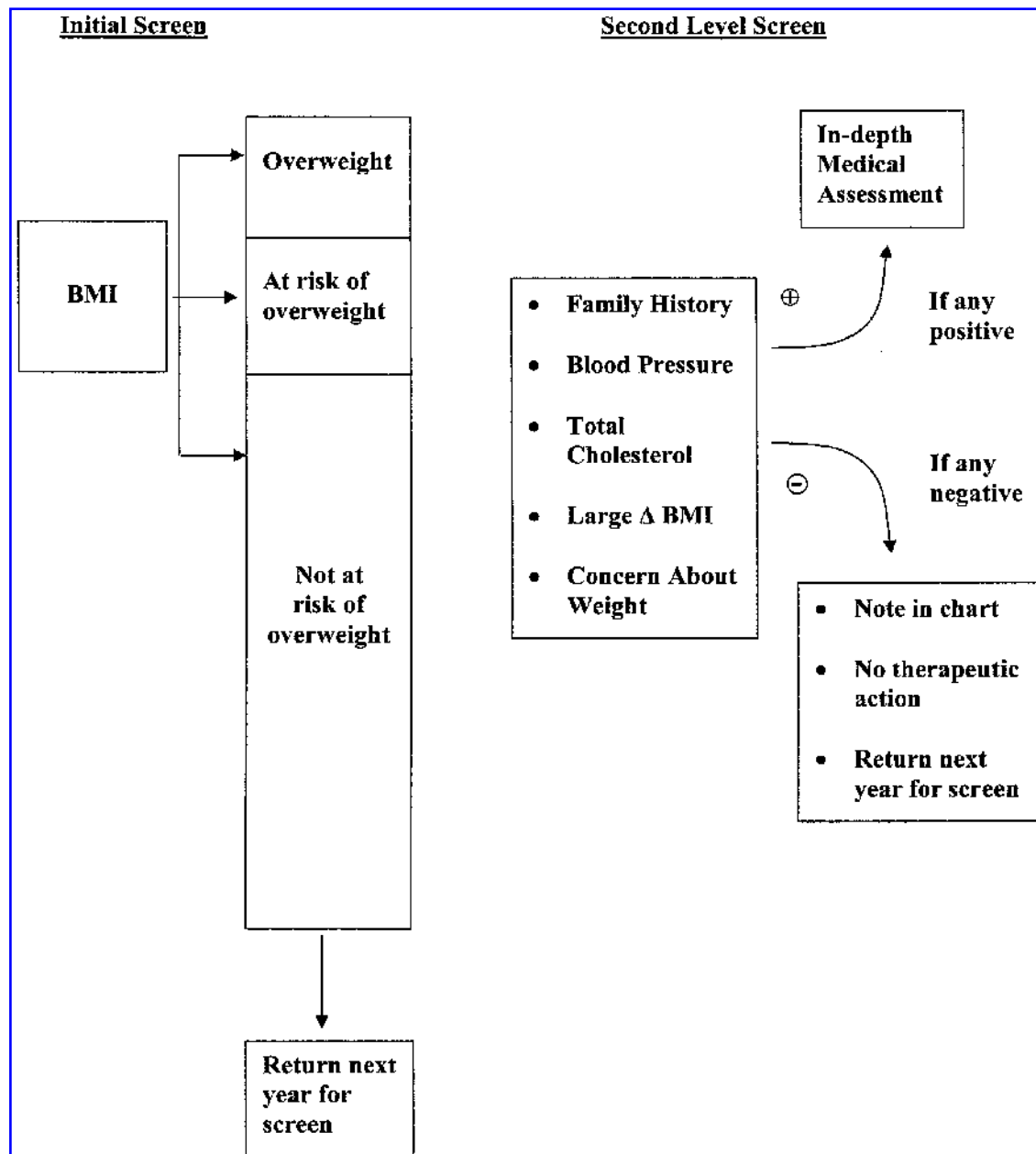
Body–mass index (BMI) is the ratio of weight in kilograms to the square of height in meters ( $\text{kg}/\text{m}^2$ ). BMI is widely used to define overweight and obesity, because it correlates well with measures of body fatness and is derived

from commonly available data, weight, and height.<sup>9</sup> The pediatric growth charts for the U.S. population, which include BMI for age and gender, are readily available ([www.cdc.gov/growthcharts](http://www.cdc.gov/growthcharts)), and allow longitudinal tracking of BMI.<sup>10</sup>

In children, BMI between the 85th and 89.9th percentile for age and gender is considered at risk of overweight, and BMI at or about the 95th percentile is considered overweight or obese.<sup>11,12</sup> There is no category for obesity that avoids stigma. Until more definitive recommendations are established, the American Academy of Pediatrics Committee on Nutrition recommends that children and adolescents with BMI greater than or equal to the 95th percentile for age and

gender should undergo in-depth medical assessment and treatment unless some contraindication is found (see Fig. 1).<sup>13</sup> This percentile is used because it not only identifies children with a significant likelihood of adult obesity,<sup>14,15</sup> but in older adolescents, it is associated with elevated blood pressure and lipid profiles that increase the risk of obesity-related disease and mortality.<sup>16,17</sup>

A child whose BMI falls between the 85th and the 95th percentile for age and gender should be evaluated carefully, with attention to secondary complications of obesity such as hypertension and dyslipidemias. Evaluation and treatment should also be prompted by a recent large increase in BMI.<sup>13</sup>



**FIG. 1.** Guidelines for overweight in adolescent preventive services: recommendations from an expert committee. Reproduced with permission from Heinz and Dietz.<sup>11</sup> BMI, body-mass index.

## SCOPE OF THE PROBLEM

The prevalence of obesity among children and adolescents has been increasing steadily since the mid-1960s. Between the 1960s and 1988–1994, prevalence among 6-through 11-year-old children increased from 4% to 11%. During this same time period, prevalence among 12- through 19-year-olds increased from 5% to 11%.<sup>18</sup> Currently, 15.3% of 6- through 11-year olds, and 15.5% of 12- through 19-year olds meet the criteria for obesity.<sup>19</sup>

Recent data suggest that overweight and obesity is more common among specific population subgroups, including African Americans and Hispanics. For example, prevalence of overweight for non-Hispanic black children 6–11 years of age is 19.5%; for Mexican Americans, it is 23.7%. In contrast, 11.8% of non-Hispanic white children in this age range are overweight.<sup>20</sup> The prevalence of overweight among males was not significantly different than among females, although among Mexican American adolescents a nonsignificant trend toward an increase in males was seen.<sup>19</sup> These race/ethnic trend disparities remained large and statistically significant after controlling for family income and other confounding variables. In fact, keeping adolescents in their same environment and changing only family income and parental education had a limited effect on the disparities in overweight prevalence.<sup>21</sup> It may be that cultural attitudes about body weight and food are more important than socioeconomic status (SES). This appears to be the case in Caucasians as well.

The literature on ethnicity and body size in children is inconsistent. A study of 219 Mexican children (6- to 12-years old) from affluent families indicated that children are more likely to be obese if they are boys, from small households with few or no other children, and more permissive, less authoritarian parents.<sup>22</sup> The value placed on children, especially sons, in smaller middle-class Hispanic families can result in indulgent feeding because food treats are a cultural index of parental caring, and parents value child fatness as a sign of health. Interestingly, these obese Mexican children had no greater social or psychologic problems than their nonobese peers.<sup>22</sup> African American females, as contrasted with white females, have been reported to have an aesthetic preference and physical tolerance for increased adiposity,<sup>23</sup> and less dissatisfaction with body weight.<sup>24</sup> Black adolescent girls were much more likely than white girls to be satisfied with their body size, to describe themselves as thinner than other girls, and to say they were not overweight.<sup>25</sup> In contrast, in a study of 969 third-grade northern California public school children where overweight concerns and body dissatisfaction were highly prevalent among girls and boys across ethnicity and SES, young Latina and African American girls manifest equivalent or higher levels of disordered eating attitudes and behaviors than white and Asian American girls.<sup>26</sup> Finally, a study of more than 1200 Asian, Hispanic, black, and white men and women indicated eth-

nicity, independent of age, education, and body weight, does not influence preference for female and male shapes or tolerance for obesity.<sup>27</sup> In light of these discrepancies, future research in the cross-cultural aspects of body dissatisfaction, overweight, and obesity is warranted.

## HEALTH IMPLICATIONS OF CHILDHOOD OBESITY

Pediatric obesity is associated with significant health problems and is an important early risk factor for adult morbidity and mortality.<sup>28–30</sup> Medical problems are common in obese children and adolescents, and affect the cardiovascular system (hypercholesterolemia and dyslipidemia, hypertension)<sup>31–35</sup> and endocrine system (hyperinsulinemia, insulin resistance, impaired glucose tolerance, type 2 diabetes, menstrual irregularities, early sexual maturation).<sup>36–39</sup> Cook et al.<sup>40</sup> recently reported that a metabolic syndrome phenotype might exist in perhaps 4% of the U.S. adolescent population and almost 30% of overweight adolescents. These children may be at higher risk for the metabolic syndrome in adulthood and the subsequent risks for type 2 diabetes and premature coronary artery disease.<sup>40</sup> Other important complications and associations include pulmonary (asthma, obstructive sleep apnea syndrome, Pickwickian syndrome, sleep-related breathing disorders),<sup>41–47</sup> orthopedic (*genu varum*, slipped capital femoral epiphysis, lower bone mass),<sup>48–50</sup> and gastrointestinal/hepatic complications (nonalcoholic steatohepatitis, cholecystitis).<sup>51,52</sup> (See Barlow and Dietz<sup>13</sup> for a complete list and approximate prevalence of obesity-associated conditions in children.)

There is a strong link between obesity during childhood and adolescence and obesity in adults. Whitaker et al.<sup>53</sup> showed that the odds of being obese as an adult were 1.3 for obesity at ages 1–2 years and increased to 17.5 for obesity at ages 15–17 compared to not being obese at these ages. Kvaavik et al.<sup>54</sup> concluded that tracking of BMI from adolescence into adulthood was substantial. In fact, it has been estimated that the risk of adult obesity is 20% at age 4, but rises to approximately 80% by adolescence.<sup>14</sup> Numerous comorbidities seen in obese adolescents will likely persist into adulthood.<sup>28</sup>

When physicians talk to and care for children who are overweight, sensitivity and compassion are paramount. In many obese children and adolescents, a widespread consequence of obesity is psychologic.<sup>30</sup> Obese children may already be suffering from depression, low self-esteem,<sup>55–57</sup> and social marginalization.<sup>58</sup> A modest association between depressive symptoms and BMI was found for overweight girls (but not boys) in third grade, explained by an excess of overweight concerns in these children.<sup>59</sup> Despite increased prevalence of obesity, stigmatization of obese children has gotten worse, and obese children suffer greater rejection than in the past. Fifth- and sixth-grade children

ranked a picture of an obese child lower than that of a child holding crutches with a brace on one leg, a child sitting in a wheelchair with a blanket covering both legs, a child with no left hand, and one with a facial disfigurement.<sup>60</sup> This may explain the lower self-esteem and greater shame, humiliation, and teasing experienced by an overweight child, compared to their nonobese peers.<sup>61,62</sup> Consequences of stigma persist into early adolescence and adulthood.<sup>60</sup> Schwimmer and colleagues<sup>63</sup> reported that even in the absence of comorbid disease, obese children and adolescents (ages 5–18 years) have lower health related quality of life (QOL) (which assesses physical, emotional, social, and school functioning) than children and adolescents who are healthy, and similar QOL as those diagnosed as having cancer. Friedlander et al.<sup>64</sup> reported similar findings in children 8–11 years of age. A practitioner who understands the psychologic significance of a child's or adolescent's obesity will be able to focus concerns on health, not self-worth, or to refer for counseling if necessary.<sup>65</sup>

### BASIC ELEMENTS OF AN OHE IN CHILDHOOD OBESITY

Components of an OHE most readily incorporated into the management of childhood obesity include healing intention, healing relationships, health promotion and disease prevention, and healing spaces. Each of these is discussed below.

#### *Healing intention*

Healing intentionality is the effort by one or more persons to improve the health status of another person (or oneself) through conscious, purposeful actions.<sup>7</sup> In the treatment of childhood obesity, pediatricians, members of the health care team, and children are all involved in this process. Importantly, parents must be willing to be part of the treatment as well,<sup>66</sup> and be supported in their efforts.

The decision to attempt weight loss treatment should take into account the patient's readiness to make necessary lifestyle changes, because patient motivation is critical to the success of an obesity treatment program. Motivational readiness can be determined by understanding stages of change.<sup>67,68</sup>

In the precontemplation stage, patients have no intention to change. If a parent brings a child to the doctor for a routine physical, immunization, or medical problem (e.g., sore throat), he or she is not likely to be thinking about their child's body weight. But that does not mean the physician should lose this opportunity to discuss body weight with patient and parent (see Healing relationships section for more information on physician and patient communication about weight). At this stage, the goal for patients (and their family members) is to begin thinking about changing behavior.

The physician may engage the child (and family members) in contemplating change. When the child is in the room, the provider has a captive audience and an opportunity to educate the child and parent and motivate further action. Parents in denial about their child's weight will not make the extra effort to bring the child back unless they are aware of the importance of follow-up. At the very least, clinicians should gather objective data, including blood pressure, height, and weight. The child's BMI should always be calculated and plotted (Daniel Delgado, M.D., personal communication, June 2003).

The contemplation stage is characterized by an intention or willingness to change. During this stage, barriers as well as benefits of change must be assessed. In adults, one barrier may be the patient's belief that losing weight and exercising is stressful, difficult, painful, or even hopeless, as evidenced by the high relapse rate among dieters. There are few data regarding these perceptions in children. One study reported a family-based approach resulted in a higher percentage of weight reduction and better maintenance of weight loss compared to a child-centered approach.<sup>66</sup> Success was attributed to a lower level of resistance to change by children because weight-loss-related decisions were not theirs. In the control group, although children were encouraged to seek their parents' help if needed, any change in weight was a result of their own efforts (e.g., self-control and exercise). Many of these children claimed they felt stressed and frustrated when they failed to achieve or maintain weight loss.

In an OHE, empathy, validation, praise, and encouragement on the part of the physician is particularly necessary during the contemplation stage.<sup>69</sup> The way in which clinicians discuss body weight with patients (and their family members) may affect receptivity to counseling.<sup>70</sup> Clinicians should communicate with a nonjudgmental attitude that "distinguishes between the weight problem and the patient with the weight problem."<sup>71</sup> A new contract between physicians and patients, proposed by Downey and Stern<sup>72</sup> (see box entitled Proposed Contract Between Physician and Patient) provides a model that can be used in clinical practice, and supports many aspects of the healing relationship including trust, credibility, honesty, expectation, courtesy, respect and communication. This is a model for approaching adult obesity that should be modified for children and adolescents (see Healing relationships section for further discussion).

Patients reach the preparation stage when they are ready to make a specific change. At this point, a program individually suited to their needs will be devised and other health care professionals will join the treatment team (see Health promotion and disease prevention section for further discussion). As the patient's determination to change increases, he or she may experiment with small but inconsistent changes. For example, a child may watch fewer hours of television once per week as he or she attempts to decrease

### Proposed Contract Between Physician and Patient

I, your doctor, am concerned about the growing problem of obesity among my patients. I am more concerned that many of you find it difficult to talk to me about your weight. You might feel this way. Therefore, I promise: (1) to keep up to date on the latest scientific and medical understanding of causes and treatments of obesity; (2) to work with my office staff to make sure everyone is comfortable and respected in my office; (3) to commit to work with you on your weight issues, if any, and if you want to; (4) to research community resources that might be helpful to you; (5) to make appropriate referrals if you need greater expertise than those I can provide; and (6) to work with you to obtain insurance coverage and to help with discrimination you face because of your weight.

I, the patient, agree: (1) that my weight is an important part of my health; (2) to provide you with a history of my family's weight, my weight, and my efforts to lose weight; (3) to work with you on a plan for weight loss or weight maintenance, and improving my fitness; and (4) agree that, if you do your homework, I will work as hard as I can to follow your recommendations.

Reprinted with permission from Downey and Stern.<sup>72</sup>

physical inactivity. At this stage, physicians or other members of the health care team should encourage patients to address the barriers to changing this behavior on a more regular basis (e.g., watching fewer hours of television every day).

Patients reach the action stage when they perform a behavior regularly for 6 months. Any such action taken by patients should be praised because it demonstrates the desire for lifestyle change. The health care team should continue to ask about successes and difficulties and be generous with praise and admiration. The final stage of maintenance is reached when changes are sustained. It is not uncommon, however, for patients to find themselves moving through stages of change several times before change becomes truly established. By identifying a patient's position in the change process, physicians can intervene as necessary and help patients move along these stages of change.<sup>69</sup>

### *Healing relationships*

Healing relationships, previously defined as "the quality and characteristics of interactions between healer and healee that facilitate healing"<sup>77</sup> occur in nonclinical social supportive interactions and/or the therapeutic alliance (the doctor

and nurse-patient/family relationship). Although there is published research regarding the therapeutic alliance as it pertains to treating adult obesity, there are few published data with respect to this relationship in treating pediatric obesity. Nevertheless, this component of an OHE is critical, and should be emphasized in research design.

The first step in developing a therapeutic alliance is for physicians to take a more active role in the identification and treatment of their overweight or obese patient, including those who are at risk for overweight and obesity.<sup>8</sup> Adult patients who were counseled by a physician and told specifically to lose weight were significantly more likely to report attempts at weight loss compared to those who were not.<sup>73</sup> Achieving and maintaining weight loss in adults is more likely to be successful when there is a physician-patient partnership that provides the support and motivation for the patient's effort to initiate and maintain a healthy body weight.<sup>69</sup> We hypothesize a similar result is likely in the pediatric population.

Weight counseling patterns of U.S. pediatricians are inconsistent. Miller et al.<sup>74</sup> reported that pediatricians frequently referred mildly underweight children but not moderately obese and overweight children for nutritional work-ups. Many physicians are reluctant to initiate treatment in overweight children with no associated medical conditions.<sup>65</sup> In a survey of physicians regarding their attitudes and practices related to the treatment of pediatric obesity in a primary care setting in which 27.7% of adolescents and 23% of children were assessed as overweight, the frequency with which physicians addressed weight issues in both groups increased incrementally with the patient's level of overweight.<sup>75</sup> In a recent study of pediatricians, approximately 50% reportedly always counseled about maintaining a healthy weight. Those who always counseled were more likely to be women and to spend more time with patients during well-care visits.<sup>76</sup>

When addressing obesity, 25% of physicians think they are not at all or only slightly competent, while 20% report feeling not at all or only slight comfortable.<sup>75</sup> In some clinical cases, providers feel uncomfortable bringing up the issue, and in other cases, they do not want to make the patients feel uncomfortable. This issue is compounded by discussion with overweight parents about their overweight children.<sup>77</sup> Physicians may have similar prejudices that society holds,<sup>78-80</sup> and often "blame the obese patient" for being obese, thinking the solution to obesity is a simple one, "eat less and exercise more." These findings suggest physicians would benefit from additional training and education regarding safe and efficacious intervention strategies for pediatric obesity, to effectively integrate discussion of weight issues into the primary care setting. A survey of pediatricians, pediatric nurse practitioners, and dietitians indicated high interest in additional training in the use of behavioral management strategies, guidance in parenting techniques, and addressing family conflicts.<sup>81</sup> With no training in obe-

sity counseling, physicians discussed weight with 42%–47% of their patients. With training, this number increased to 89%.<sup>82</sup>

Other cited barriers to physician involvement include lack of reimbursement (see Research setting section for further discussion), lack of parent involvement, lack of patient motivation and compliance, lack of support services, time available for counseling and pessimism about treatment outcomes.<sup>81,83,84</sup> Among those who do address dietary issues with their patients, the time spent discussing weight management has been reported to be 5 minutes or less.<sup>84</sup> Interestingly, pediatricians report similar barriers to prevention and treatment of type 2 diabetes.<sup>85</sup>

Even when physicians are interested in taking an active role in this area, they need to consider how to broach the topic of overweight and obesity in their patients, and act with sensitivity and compassion.<sup>69</sup> Obesity is one of the few conditions still actively discriminated against by the public and health care providers. Historically, the public has used the words obese and fat in a pejorative manner<sup>86</sup> as in “you fat. . . .” Numerous studies show that obese individuals, whether children or adults, are subjected to pervasive prejudice and discrimination.<sup>87–90</sup> Health care professionals themselves seem to share society’s negative attitudes toward obesity, often stereotyping them as “weak-willed, ugly, and awkward”<sup>79</sup> and “lacking in self-control and lazy.”<sup>80</sup> More than 50% of physicians viewed obese adults as awkward, unattractive, ugly, and noncompliant.<sup>78</sup> Despite these views, obese women, when asked about their physicians’ weight management attitudes and practices, did not report being treated disrespectfully or routinely alienated by physicians making critical or offensive remarks about weight.<sup>91</sup> It is unknown whether pediatricians have a similar attitude toward obese children, or, if these children (or their parents) feel disrespected by pediatricians when discussing weight.

Wadden and Didie<sup>92</sup> surveyed obese men and women to determine terms that obese individuals find undesirable or desirable for their doctors to use to describe excess weight. “Fatness” and “obesity” were rated as undesirable to very undesirable descriptors for doctors to use in discussing body weight. Physicians’ use of such terms could abruptly halt a needed discussion of an important topic. By contrast, the descriptors weight, excess weight, and BMI were rated neutral to desirable. Of these three, weight was the most desirable term, probably because it is nonjudgmental and easily understood. Thus, it is essential to determine what terms are most acceptable to overweight and obese children and their parents so that when pediatricians initiate conversations about body weight, all are receptive to the discussion.

This may be particularly true for parents who have different perceptions about obesity than do health care professionals. An anonymous questionnaire was distributed during well-care visits involving children 4–8 years of age at a pediatric faculty practice. Of 83 parents surveyed, 23% had

overweight children. These parents did not differ from other parents in their level of concern about excess weight as a health risk or in their knowledge of healthy eating behaviors. But the two groups of parents did differ in the accuracy of their perceptions about their children’s weight. Only 10.5% of parents of overweight children perceived their child’s weight accurately compared to 59.4% of other parents. Parents of overweight children invariably underestimated their children’s weight.<sup>93</sup> Considering the key role of parents in treatment outcomes<sup>3</sup> it would be important to understand underlying bases for parental attitudes regarding their child’s body weight, especially in sociocultural contexts. Without this understanding, communication between health care providers and parents may be ineffective.

Third, physicians need to develop trust with their patients. Research conducted in Canada over 20 years found the more trust-based and patient-centered an encounter between physician and patient, the better the outcome for the patient.<sup>94</sup> Therefore, Canada’s physician education program emphasizes building a trusting physician–patient relationship. A confrontational approach is far more likely to result in hurt feelings than weight loss.<sup>92</sup> According to Johnson<sup>86</sup>: “Practitioners who insist they are breaking through patient’s denial by calling them obese should realize what they are more probably breaking is the patient’s trust and desire to return for further care.” Trust must also be developed between practitioners and family members. Studies of preadolescent children have demonstrated improved long-term outcome when a parent participates in the treatment program.<sup>3,95</sup> A survey of pediatricians, pediatric nurse practitioners, and registered dietitians indicated that nearly all respondents involved a parent or the entire household in the treatment of preschool and school-aged children.<sup>65</sup> The Expert Committee of the American Academy of Pediatrics recommends practitioners engage the entire household in the eating and activity changes to create a healthy environment.<sup>13</sup>

Finally, personal characteristics of practitioners, such as their own body-weight status, eating habits, and exercise habits might affect their approach to the management of obesity. These characteristics might also influence their effectiveness in counseling and serving as role models for children and adolescents with obesity problems and their parents.<sup>96</sup> This subject needs further study.

A key aspect of research describing OHEs for the management and treatment of childhood obesity is not so much the provision of appropriate training materials to health care providers, but rather, figuring out the best way to present these materials to children and their parents via the therapeutic alliance.

### *Health promotion and disease prevention*

The primary goal of childhood obesity interventions is regulation of body weight and fat with adequate nutrition

for growth and development.<sup>97</sup> For long-term weight maintenance, old eating and exercise behaviors must be replaced with new, healthier behaviors, thereby allowing healthier behaviors to persist throughout development and into adulthood.<sup>97</sup> Comprehensive lifestyle changes, including diet modification, exercise (physical activity), and behavior modification are an integral part of any intervention program aimed at weight control in children.<sup>97</sup>

The American Academy of Pediatrics recommends the following general approach to therapy (Table 1).<sup>13</sup>

The literature on treatment of pediatric overweight has already been extensively reviewed,<sup>97,98</sup> and concludes that Epstein's four long-term family based studies provide the basis for much of our current understanding of treating pediatric obesity. His target group (children ages 6–12 years) is similar to our proposed study group (children 8–12 years of age) and his program integrates diet, physical activity, and behavior modification strategies.

*Diet.* Dietary goals for patients and their families are well-balanced, healthy meals and a healthy approach to eating.<sup>13</sup> Because parents can control access to, and model behaviors involving, food purchasing, preparation, and consumption, particularly among young children, the involvement of the family in dietary modification is important. Key findings from the 10-year follow-up treatment of 143 families showed that the program was significantly improved when the intervention was aimed at the parents as well as the child.<sup>3</sup> Other research supports parents as the exclusive agents of change in the treatment of childhood obesity. Furthermore, family-based approaches provide the additional benefits of improving parental diet and physical activity patterns and reducing parental obesity.<sup>66</sup>

Different approaches to healthy eating have been proposed. One approach is following the Food Guide Pyramid for Young Children (see [www.usda.gov/fcs/cnpp.htm](http://www.usda.gov/fcs/cnpp.htm)). Another is the Stoplight Diet.<sup>99</sup> The latter has been used in research and clinical settings for the treatment of childhood obesity.<sup>3</sup> It encourages consumption of low-calorie “green” foods and moderate calorie “yellow” foods over high-calorie “red foods.” No foods are forbidden. Recently, a reduced-

glycemic load diet was reported to be a promising alternative to a conventional diet in obese adolescents, but there are no current data to support the use of this diet in children.<sup>100</sup> Ultimately, the best dietary approach is one that the patient and their family members will follow with a high level of compliance.

*Physical activity.* National health objectives for the year 2010 include increasing levels of physical activity and reducing sedentary behavior among children and adolescents.<sup>101</sup> To provide a baseline assessment of physical activity levels among children ages 9–13, the Centers for Disease Control and Prevention (CDC) conducted the Youth Media Campaign Longitudinal Survey (YMCLS). Data from this survey of children and their parents indicate that 61.5% of children in this age range do not participate in any organized physical activity during nonschool hours and 22.6% do not engage in any free-time physical activity. Fewer children reported involvement in organized sports (38.5%) than in free-time physical activity (77.4%) during the 7 days preceding the survey. Non-Hispanic black and Hispanic children were significantly less likely than white children to report involvement in organized activities, as were children with parents who had lower incomes and education levels. Barriers to participation in physical activities, regardless of the child's age and gender include concerns about transportation, opportunities in their area, and expense. Overall, parents with lower incomes and education levels reported more barriers.<sup>102</sup>

Physical activity is essential to long-term maintenance of weight control in children, and interventions aimed at either increasing physical activity or decreasing physical inactivity (sedentary behaviors) are useful in treating pediatric obesity.<sup>103</sup> The majority of exercise programs have focused on aerobic exercise. However, there has been very little research on the best way to implement aerobic exercise programs to maximize weight loss and adherence. Several other important issues needing study include: Can resistance training be used safely in a pediatric population to maximize the development of lean body mass and increase total energy expenditure? Is it better to focus on one activity or is cross

TABLE 1. AMERICAN ACADEMY OF PEDIATRICS GENERAL APPROACH TO THERAPY

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- Intervention should begin early.
  - The family must be ready for change.
  - Clinicians should educate families about medical complications of obesity.
  - Clinicians should involve the family and all caregivers in the treatment program.
  - Treatment programs should institute permanent changes, not short-term diets or exercise programs aimed at rapid weight loss.
  - As part of the treatment program, a family should learn to monitor eating and activity.
  - The treatment program should help the family make small, gradual changes.
  - Clinicians should encourage and empathize and not criticize.
  - A variety of experienced professionals can accomplish many aspects of a weight management program.
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From Barlow and Dietz.<sup>13</sup> Reproduced with permission.

training better? And, is the combination of aerobic and resistance training better than aerobic exercise alone? The structure of the program may also be important for developing active lifestyles in treating obesity. Data from several trials incorporating moderate to intense aerobic exercise suggest that school-based exercise interventions may be a promising approach to treating childhood obesity.<sup>104</sup> In addition, the family is important to structure and support activity, as parent activity level is a strong predictor of child activity.<sup>105</sup>

In the health care setting, interventions focused on increasing physical activity should be delivered in a nurturing, nonintimidating environment. Obese children respond differently physiologically and emotionally to exercise than do normal-weight children, and experience negative consequences to participation in activities considered appropriate for normal-weight children.<sup>106</sup> In clinical settings, specialized exercise programs that include specific recommendations for obese children have been shown to enhance safety, efficacy, and compliance during treatment.<sup>106</sup> Optimal results may be achieved by combining programs to reduce sedentary behaviors with those that increase physical activity,<sup>103</sup> such as walking or biking to school instead of riding.

An OHE for the treatment of childhood obesity should examine and modify, as necessary, the home environment as it pertains to physical activity. Some children spend more time in front of the television and playing video games than doing any other activity other than sleeping.<sup>107</sup> Watching television often decreases the amount of time spent performing physical activities, and is also associated with increased food consumption either during viewing or as a result of food advertisements.<sup>107,108</sup> In a study of sixth- and seventh-grade students, time spent watching television along with the number of soft drinks consumed were significantly associated with obesity. Latinos spent more time watching television and consumed more soft drinks than did non-Hispanic whites or Asian students.<sup>109</sup> Children who watched 4 or more hours of television per day had significantly greater BMI, compared to those watching less than 2 hours per day.<sup>110</sup> Furthermore, having a television in the bedroom has been reported to be a strong predictor of being overweight, even in preschool-aged children.<sup>111</sup>

The American Academy of Pediatrics has recommended limitation of television to 1 or 2 hours per day.<sup>112</sup> The results of a randomized trial to decrease television viewing for school-aged children has provided the strongest evidence to support the role of limiting television in prevention of obesity. In this study, decreasing “media use” without specifically promoting more active behaviors in the intervention group resulted in a significantly lower increase in BMI at the 1-year follow-up, compared to the control group.<sup>107</sup> Additional support for the importance of decreasing television viewing comes from controlled investigations that demonstrated that obese children who were reinforced for

decreasing sedentary activity (and following an energy-restricted diet) had significantly greater weight loss than those who were reinforced for increasing physical activity.<sup>97</sup>

*Behavior modification strategies.* Behavior modification strategies that have been used in the treatment of childhood obesity include self-monitoring of activity and eating, use of praise and contracts with nonfood and nonmonetary rewards, stimulus control to make the home environment more conducive to a healthy lifestyle, role-modeling of healthy behaviors by parents, and avoidance of overregulation of children’s food consumption.<sup>97</sup>

Children are widely exposed to television advertisements for ready to eat sugared cereals to “Happy Meals” from McDonald’s. Even though children do not drive themselves to fast-food restaurants or to grocery stores, they often influence adult food purchasing behavior. The question, “Who is the boss?” is often answered “I am” by a young child who has manipulated their tired or stressed parent into purchasing ready-to-eat foods, easily accessibly on supermarket shelves or near the checkout stand, that may be high in fat and sugar. Furthermore, parental efforts to limit children’s intake of sweet snacks and drinks are being undermined by their child’s access to money.<sup>113</sup>

Because parents institute the changes needed for successful treatment, they need support and guidance in basic parenting skills.<sup>13</sup> The American Academy of Pediatrics<sup>13</sup> recommends the following parenting skills in the management of eating and activity behaviors: (1) find reasons to praise the child’s behavior; (2) never use food as a reward; (3) parents can ask for “rewards” for children in exchange for the changes in their own behavior; (4) establish daily meal and snack times; (5) determine what food is offered and when but allow the child to decide whether to eat; (6) offer only healthy options; (7) remove temptations; (8) be a role model; and (9) be consistent.

Although progress has been made in the treatment of childhood obesity, most pediatric obesity interventions are marked by small changes in relative weight or adiposity and substantial relapse.<sup>97</sup> It is premature to assume there are efficacious standardized treatments. Research is needed to improve treatment outcome and maintenance of treatment effects. Obesity is a chronic disease, and chronic diseases require long-term treatment. For childhood obesity treatments to be effective long-term, explicit change on the part of the patient, family members, and health care practitioners is necessary. In addition, changes in the school and after-school environment, community, and even state and local government (e.g., legislation) may be necessary,

Currently there are many programs being conducted throughout all sectors of American society to reverse the rapidly increasing prevalence of overweight and inactivity among children and adolescents. “Shaping America’s

Youth” is a nationwide initiative to identify and centralize this information (see: [www.shapingamericasyouth.com](http://www.shapingamericasyouth.com)). Ultimately, information on local and regional programs that may be outside the healthcare system may be helpful to primary care physicians working with obese patients.

### Healing spaces

Brownell and Horgen<sup>114</sup> have coined the term “toxic environment” to illustrate what most U.S. adults and children experience almost every waking hour of every day of every year, namely an abundance of food, and very little reason to move our bodies. The food is available 24 hours per day, accessible in restaurants, machines, and stores as never before, sold in places previously unrelated to eating (e.g., gas stations, drugstores), inexpensive, promoted heavily and sometimes deceptively, and designed to taste really good and keep people coming back for more.”<sup>114</sup> Between 56% and 85% of children in school consume at least one soft drink daily, with the highest amount consumed by adolescents males.<sup>115</sup> On a typical day, 30% of children and adolescents ages 4–19 years old consume fast food.<sup>116</sup>

The second half of the energy equation, physical activity, has also been affected adversely. According to Brownell and Horgan:<sup>114</sup> “Few children walk or bike to school, and often have little physical education. Computers, video games, and televisions keep children inside and inactive, and parents are reluctant to let children roam free to play.” Each of these potentially healing spaces—home, school, and community environments—contributes to childhood obesity, and each of these eventually must play a role if the problem of childhood obesity is to be solved.

The physical environment that exists in the health care professionals’ office also should be addressed. The space should communicate support to patients and their family members. As such, it should be accommodating, accessible and comfortable to overweight and obese patients. Although this may be less of an issue for obese children compared to obese adults, stairs, doorways, hallways, restrooms, and waiting room chairs should be evaluated for their suitability to meet the needs of the large patient. In addition, specialized equipment (e.g., blood-pressure cuffs, private scales, large gowns, tape measures, step stools) is necessary to consider when looking at components of optimal healing spaces.<sup>117</sup>

There is no research to direct recommendations regarding nature, light, fresh air, color, aroma, music, fine arts, and architecture with respect to healing spaces and the management of childhood obesity. A bowl of fresh fruit, rather than a bowl of candy, to welcome patients enforces the message of healthful eating. Rewards of stickers, pencils or toys may be given to patients instead of the usual “sweet treat.” The environment should be “child-friendly” and promote comfort and caring, rather than anxiety or distress.

## FUNDAMENTAL DESIGN OF RESEARCH: HYPOTHESIS, STUDY GROUP, OUTCOME MEASURES

### Hypothesis

Despite the growing prevalence of childhood obesity, there are few, if any, successful models of OHE for these children. We have chosen to focus on the therapeutic alliance, and hypothesize that creating an OHE for patients and their family members through the therapeutic alliance will allow health care providers to initiate treatment, which ultimately results in a beneficial outcome. Using a managed care setting, pediatricians will be randomly assigned to two groups. The treatment group will receive all necessary materials and training to facilitate the development of a therapeutic alliance. The control group will conduct “business as usual.”

### Selection criteria

The study group will include children between 8 and 12 years of age who meet the CDC criteria for overweight or obese (BMI at or above the 95th percentile for age and gender) or “at risk” for overweight (BMI between 85th and 95th percentile). Table 2 provides a preliminary quick assessment of overweight in children, in the absence of a set of CDC growth charts.<sup>118</sup>

In addition to age and BMI, criteria for study inclusion may include a positive family history of obesity, increased blood pressure, increased total cholesterol levels, a large change in BMI, or concern about weight. An in-depth medical assessment of all children will be conducted. These criteria are based on the American Academy of Pediatric Expert Committee Recommendations (Fig. 1).<sup>13</sup>

### Exclusion factors

Identifiable exogenous causes of obesity are rare.<sup>13</sup> However, children with organic causes of obesity, such as Prader-Willi syndrome, Turner syndrome, Cushing’s syndrome, or

TABLE 2. ASSESSMENT OF OVERWEIGHT IN CHILDREN

Age	Child is overweight if his/her BMI is at or above:	
	Boys	Girls
8	20.0	20.6
9	21	21.6
10	22	22.9
11	23.1	24.0
12	24.2	25.2

BMI, body-mass index.  
From Moore.<sup>118</sup>

hypothyroidism will be excluded. Children with clinical depression or an eating disorder identified by the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition-revised (*DSM-IV-R*) will also be excluded.

### Research setting

Conducting the study in a managed care environment (e.g. Kaiser Permanente) will facilitate a concerted effort being made to develop an OHE. A managed care environment includes the primary care pediatrician and other health care providers (e.g., nurses, dietitians, exercise trainers, behavior therapists, and psychologists) who work together with the patient/family. A multidisciplinary treatment program provides the most flexible, individualized, and effective strategy.<sup>119,120</sup> Even if a pediatrician in private practice had access to other health care providers, obtaining their services is impossible for many patients because they lack insurance coverage.<sup>121</sup> One study found that only 11% of pediatrician-ordered treatments for obesity were reimbursed.<sup>122</sup> The lack of reimbursement for treating obese patients is the leading barrier to providing care, even when health care providers acknowledge their leading role for overweight and obesity prevention and treatment efforts.<sup>77</sup> Lack of reimbursement would not be a problem in the health management organization (HMO) setting.

However, possible barriers to the managed care approach include whether or not and to what extent HMOs cover the treatment of obesity. Care varies from state to state and from health plan to health plan. In California, the basic language is that health plans provide all basic, medically necessary health services.<sup>123</sup> But it is not clear what constitutes medically necessary service for an overweight or obese child, or even one at risk for overweight or obesity. Beyond surgery for morbid obesity, HMOs benefit packages are relatively silent on obesity management.<sup>123</sup>

### Outcome measures

Behavioral, medical, and weight goals as described by the American Academy of Pediatrics, Committee on Nutrition will serve as major outcome measures.<sup>13</sup> In summary, the primary behavioral goal of a program to manage uncomplicated obesity is healthy eating and activity, not achievement of ideal body weight. The medical goal is aimed at children with secondary complications of obesity. It includes the improvement or resolution of the complication such as abnormal blood pressure or lipid profile. With respect to weight, the first step is maintenance of baseline weight, followed by prolonged weight maintenance that allows a gradual decline in BMI as the child grows in height. For children older than 7 years with BMIs between the 85th and 95th percentile and no secondary complications of obesity, prolonged weight maintenance is an appropriate goal. However, weight loss is recommended if a child in this age and BMI range has a

non-acute secondary complication of obesity, or a BMI at the 95th percentile or above. An appropriate weight goal for all obese children is a BMI below the 85th percentile although such a goal should be secondary to the primary goal of health eating and activity.

In the context of an OHE, it is important to determine what effect, if any, the therapeutic alliance has on the treatment of childhood obesity, and the achievement of the goals described above. It is important to determine what aspects of the therapeutic alliance are beneficial, and what aspects are potentially detrimental to the outcome. What tools are needed to help physicians feel more comfortable in assessing and treating children (and their family members) who are overweight or obese? Can these tools be standardized and serve as a template for others? The answers to these questions will help further the management of childhood obesity in the context of an OHE.

## SUMMARY

The prevention, treatment, and long-term management of childhood obesity are serious challenges facing health care professionals. Considering the high risk that an obese adolescent will become an obese adult and the high personal and societal cost of obesity, it is incumbent to examine creative solutions to this serious public health crisis. Designing an OHE for managing childhood obesity may provide some hope for children and their parents who are at risk for, or already suffering from overweight and obesity.

Although beyond the scope of this paper, it is these authors' belief that the solution to the obesity crisis will take a concerted effort not only on the part of individuals and their family members, but schools, health care professionals, communities, local, state, and federal governments and regulatory agencies, professional and scientific organizations, the food industry and the media. There is not a simple solution to this complex problem, but if we can work to send a person to Mars, perhaps we can solve the problem of obesity here on earth.

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