

## Dieting in adolescence



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### INTRODUCTION

Concern with weight and shape is extremely common during the adolescent years. In addition to being exposed to the very real health risks of obesity and poor nutrition, teenagers are being exposed to the unrealistically thin beauty ideal that is portrayed in the media (1). Unfortunately, this overemphasis on the importance of being thin is internalized by youth who equate thinness with beauty, success and health. Through media exposure, teenagers are also exposed to a number of ways to lose weight and achieve this thin ideal. The sources of information available on health and nutrition are often dubious and unreliable, motivated less by scientific evidence than by fad trends and financial incentives. The net result is that many teenagers feel the cultural pressure to be thinner than is required for good health, and may try to achieve this goal through poor and sometimes dangerous nutritional choices.

Recent Canadian data demonstrate that nearly one-half of Ontario teenagers (12 to 18 years) attending public school feel unhappy about their weight (2). Even among preadolescents, a significant number of children have a desire to be thinner (3-5). It is not surprising, therefore, that strategies aimed at changing one's weight and shape are also extremely prevalent. Canadian cross-sectional data suggest that more than one in five teenage girls are 'on a diet' at any given time (2). American (5-10), Australian (11-13) and British (14) data also suggest similar high rates of attempted weight loss among adolescents. A recent review (15) of adolescent dieting indicated that 41% to 66% of teenage girls and 20% to 31% of teenage boys have attempted weight loss at some time in the past.

### DEFINITION OF DIETING

Teenagers' reasons for dieting are varied, but body image dissatisfaction and a desire to be thinner is the motivating factor behind the majority (16). Attempts to lose weight can be associated with different behavioural changes such as alterations in eating habits and/or exercise frequency. Dieting is a poorly defined behaviour that undoubtedly has various meanings to patients and professionals alike, but to most, it suggests an intentional, often temporary, change in eating to achieve weight loss (3,17,18). Comparing studies of dieting status and degrees of dieting are problematic due

to variations in definitions; however, there is consistency in defining self-induced emesis, laxative use and diet pill use as unhealthy or extreme dieting (13,18-20). In many studies (8,10,13), chronic dieting (more than 10 diets in a year), fad dieting, fasting and skipping meals are also classified as unhealthy strategies. Many authors (8,21) refer to the use of these behaviours to achieve weight loss as disordered eating if the behaviours are not sufficiently severe to warrant a diagnosis of an eating disorder.

The spectrum of behaviours captured by dieting represents a range from healthy to unhealthy. The choices made by a teen on a diet may be consistent with recommendations for healthy living, such as increasing fruit, vegetable and whole grain intake, moderate reductions in fat intake, and increased exercise (7). However, a significant percentage of teenagers, girls in particular, engage in unhealthy behaviours to control weight. Recent Canadian data reported that 8.2% of Ontario girls aged 12 to 18 years and 4% of British Columbian girls reported self-induced vomiting as a weight control strategy (2,4). Several large cross-sectional studies have investigated the frequency of specific weight control practices (7-9,13,18,20,22). Fasting, skipping meals and using crash diets are frequent (22% to 46%). Self-induced emesis has been found to occur in 5% to 12% of adolescent girls. Laxative and diuretic use is less frequent (1% to 4%), as is diet pill use (3% to 10%). Smoking cigarettes to control weight is reported by 12% to 18% of adolescent girls.

### RISK FACTORS FOR DIETING

Determinants of dieting in teenagers are broad, therefore, identifying which teenagers are most at risk of dieting and health-compromising weight loss strategies is challenging (Table 1). In general, dieting and disordered eating behaviours in teenagers increase in frequency with age and are more prevalent among girls (8,10). Although there are some variations in socioeconomic status and ethnic groups, it is clear that no group is immune from body dissatisfaction and weight loss behaviours (8,10,23). Not surprisingly, girls who consider themselves overweight and are dissatisfied with their bodies are more likely to diet (2,3,6,20,24) and are also more likely to engage in unhealthy weight loss behaviours (20,21). As the degree of overweight increases,

**TABLE 1**  
**Correlates of dieting and unhealthy weight control behaviours in teenagers**

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Individual factors
<ul style="list-style-type: none"> <li>• Female</li> <li>• Overweight and obesity</li> <li>• Body image dissatisfaction and distortion</li> <li>• Low self-esteem</li> <li>• Low sense of control over life</li> <li>• Psychiatric symptoms: depression and anxiety</li> <li>• Vegetarianism</li> <li>• Early puberty</li> </ul>
Family factors
<ul style="list-style-type: none"> <li>• Low family connectedness</li> <li>• Absence of positive adult role models</li> <li>• Parental dieting</li> <li>• Parental endorsement or encouragement to diet</li> <li>• Parental criticism of child's weight</li> </ul>
Environmental factors
<ul style="list-style-type: none"> <li>• Weight-related teasing</li> <li>• Poor involvement in school</li> <li>• Peer group endorsement of dieting</li> <li>• Involvement in weight-related sports</li> </ul>
Other factors
<ul style="list-style-type: none"> <li>• Certain chronic illnesses, especially diabetes</li> <li>• Presence of other risk behaviors: smoking, substance use, unprotected sex</li> </ul>

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so does the risk of dieting and disordered eating (11,20,25). However, despite this association, it is important to recognize the high prevalence of dieting among normal and even underweight teenagers (4,7,11,20). In one cross-sectional American study (20), 36% of normal weight girls were dieting, compared with 50% of overweight girls and 55% of obese girls. Distortion of body image is common among adolescents who frequently 'feel fat' even at a normal weight (13,26). It is clear that the perception of being overweight is a factor in a teenager's decision to attempt weight loss, regardless of whether they are actually overweight. The majority of Canadian teenagers are at a normal weight (27), and many dieting teenagers seen in a clinical setting are, in fact, in a healthy weight range.

There are many individual factors that distinguish dieters from nondieters. In several large cross-sectional studies (4,8,28-31), self-esteem was found to be a strong factor differentiating teenagers who engage in unhealthy weight control practices from those who do not, even when controlled for body mass index (BMI). These same studies report that other positive attributes, such as having a sense of control over one's life, family connectedness, having positive adult role models and positive involvement in school, protect youth from unhealthy dieting. Not surprisingly,

studies (32-36) have also shown that parental criticism of a child's weight, pressure to diet and parental role modeling of dieting are associated with increased dieting rates and increase risk of extreme dieting behaviours.

Body dissatisfaction and unhealthy weight loss practices have been found to be more common in teenagers affected by a chronic illness (diabetes, asthma, attention deficit disorder and epilepsy) (37,38). Teenagers who experience significant psychiatric symptoms, particularly depression and anxiety, are more likely to engage in extreme dieting practices (11,39). A history of weight-related teasing is also predictive of body dissatisfaction, weight loss attempts and eating disturbance (24,40). Peer group influence also has an impact because girls whose friends value thinness and engage in unhealthy weight loss strategies are also themselves more likely to engage in unhealthy weight control strategies (16,41,42). Vegetarianism in adolescence is associated with some positive nutritional choices, such as increased fruit, vegetable and fibre intake; however, girls who are vegetarians are more likely to report dieting and certain disordered eating behaviours, such as self-induced emesis and laxative use. For some teenagers, vegetarianism may occur along with unhealthy eating behaviours (22,43). Other identified risk factors include involvement in weight-related sports, such as dance and gymnastics (44), and early puberty (45).

Studies (4,18,31,46) have demonstrated that teenagers who engage in other risk activities, including substance use, unprotected sex and illegal activity, are also more likely to engage in health-compromising weight loss strategies. A prospective study (47) also found that adolescent girls who are concerned about their weight or who are dieting are more likely to initiate smoking. This evidence suggests that disordered eating in teenagers clusters with other health-compromising behaviours.

### CONSEQUENCES OF DIETING

Although adolescent dieters may make some positive choices, changes are often temporary and we must consider possible physiological and psychological adverse effects of dieting, particularly, in light of the evidence that dieting is unlikely to be effective at achieving sustained weight loss. The majority of teenagers who diet do so without any apparent sequelae, but they may be putting themselves at risk of consequences with little chance of tangible benefit. Unfortunately, few studies have addressed possible negative consequences because most dieting in teenagers is done in an unstructured way and decisions on how to go about losing weight are haphazard and often short-lived. Several reviews (48,49) of the consequences of dieting have been undertaken, but unfortunately, the conclusions pertain to dieting adults, in whom rapid physical and psychological change is not occurring.

#### Physical consequences

Dieting is associated with potential negative physical health consequences. Nutritional deficiencies, particularly

of iron and calcium, can also pose short- and long-term risks. In growing children and teenagers, even a marginal reduction in energy intake can be associated with growth deceleration (50-52). Disordered eating, even in the absence of substantial weight loss, has been found to be associated with menstrual irregularity, including secondary amenorrhea in several cross-sectional studies (53-56). The long-term risk of osteopenia and osteoporosis in dieting girls, even in the absence of amenorrhea, is of considerable concern as well (54,57). The medical complications of any purging behaviour, such as self-induced emesis, laxative use or diuretic use, are well-established, as are the risks associated with stimulant weight loss medications.

### Psychological consequences

The short- and long-term psychological effects of dieting and food restriction on adolescents is largely unknown. Studies (58) in adults suggest that chronic dieting is associated with a variety of symptoms including food preoccupation, distractibility, irritability, fatigue and a tendency to overeat, even binge eat. While it is not known if these effects are also true for children and youth, these symptoms could have serious implications on the immature adolescent who is undergoing rapid social and psychological development. Many lifestyle habits are established during the adolescent years and alterations in the eating habits of children and adolescents could have lifelong implications for dysfunctional eating.

It is recognized that teenagers with lower self-esteem are more likely to diet, often in an attempt to feel better about themselves if weight loss is successful. The process of dieting may make the situation worse and have a further negative impact on the young person's self-esteem because, during childhood and adolescence, self-esteem is, in part, defined by successes and failures. One study (59) examined the self-esteem of children before and after participation in a structured weight loss program and concluded that a decline in self-esteem and perception occurred. An adolescent study (60) found that self-esteem was negatively impacted by participation in a 12-week multidisciplinary weight loss program for obese teenagers. These studies were small and it is not possible to draw conclusions, but we should consider the negative impact of dieting, particularly unsuccessful dieting, on a young person's self-esteem. There are no data available on the impact of self-directed dieting on the self-esteem of youth.

One of the most worrisome issues to be considered is the relationship between dieting, disordered eating and eating disorders. Teenage dieting is the usual antecedent to anorexia and bulimia nervosa. In prospective studies (12,14), dieting has been associated with a fivefold to 18-fold increased risk of developing an eating disorder. However, it is unclear whether dieting causes, triggers or represents the first stage (prodrome) to the illness. The relationship between dieting and binge eating is also controversial. The National Task Force on the Prevention and Treatment of Obesity concluded in 2000 that in overweight and obese adults, dieting was not

associated with eating disorder symptoms including binge eating (61). The review (61) focused mainly on adults in structured weight loss programs and did not address the widespread use of self-directed dieting or the impact of dieting on children and adolescents. Several other studies (10,46,62) have documented the risk of binge eating among dieting teenagers and a review (58) of the psychological consequences of food deprivation in adults concluded that deprivation resulted in a tendency to overeat and even binge eating.

Finally, there is mounting concern that dieting in preadolescents and adolescents may have the paradoxical effect of resulting in excess weight gain over time (60,63). In a recent large-scale study (63) involving over 15,000 children (nine to 14 years old) followed over a three-year period, it was observed that dieters gained significantly more weight than matched nondieters. The authors concluded that self-directed dieting in this age group was not only ineffective, but may promote weight gain.

## SUMMARY AND RECOMMENDATIONS TO CLINICIANS

Weight dissatisfaction is frequent for teenagers in North America. Behaviours to control weight are very common and exist on a spectrum from healthy to potentially dangerous. The most important risk factors for unhealthy weight control behaviours are dissatisfaction with weight, obesity and low self-esteem. Teenagers who engage in unhealthy dieting are at risk for other health-compromising behaviours, including substance use, smoking and unprotected sex. Most dieting in teenagers is not associated with negative consequences but we must consider the physical and psychological sequelae, including eating disorders, binge eating and low self-esteem. Teenagers who diet are at risk of excess weight gain over time.

The Canadian Paediatric Society's recommendations are as follows:

- For normal and overweight teenagers, encourage eating according to the Canada Food Guide (64). Discourage fad diets, fasting, skipping meals and dietary supplements to achieve weight loss. Advise teenagers to be wary of any weight loss scheme that tries to sell them anything, such as pills, vitamin shots or meal replacements.
- For normal and overweight teenagers, encourage age-appropriate physical activity in accordance with healthy active living guidelines (65). Teach teenagers that there are a variety of reasons to exercise, not just to control weight.
- Given the high prevalence of dieting behaviours in adolescent girls, screening should be included as part of routine health care. This screening can easily be incorporated into the frequently used adolescent Home, Education, Activities, Drugs, Dieting, Safety, Sexuality, Suicide/depression (HEADSSS) interview (66).

- Teenagers who are concerned about weight or shape should be educated about the difference between 'healthy weight' and 'cosmetically desirable weight'. For teenagers, these may be very different, because many teenagers want to be thinner than is required for good health. Teenagers should be encouraged to accept a realistic weight for themselves. Calculating BMI and comparing it with BMI percentile curves is the most reliable way to assess whether a teen is in a healthy weight range (67).
- Clinicians should be aware that many weight loss attempts in teenagers are not required or justified on the basis of improved health and may reflect other issues in the adolescent's life, such as low self-esteem, being teased about weight, family pressure to achieve a certain ideal or a serious psychiatric illness such as an eating disorder. For many dieting teenagers, the behaviour is not really about their weight.
- For teenagers engaging in more severe weight loss practices, screening for eating disorders should be done promptly and early referral made for assessment (68,69).
- Educate dieting teenagers about the health risks of self-induced vomiting, laxative and diuretic use, diet pills and crash diets.
- There is a paucity of data on effective interventions for obese adolescents; however, assessment and intervention should be undertaken in accordance with evidence-based and best practice guidelines (70-72). There is no evidence that commercial weight loss programs are safe or effective for children or teenagers. Where available, referral to a multidisciplinary paediatric obesity program may be beneficial.

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## REFERENCES

- Morris AM, Katzman DK. The impact of the media on eating disorders in children and adolescents. *Paediatr Child Health* 2003;8:287-9.
- Jones JM, Bennett S, Olmsted MP, Lawson ML, Rodin G. Disordered eating attitudes and behaviours in teenaged girls: A school-based study. *CMAJ* 2001;165:547-52.
- Schur EA, Sanders M, Steiner H. Body dissatisfaction and dieting in young children. *Int J Eat Disord* 2000;27:74-82.
- McCreary Centre Society. *Mirror Images: Weight Issues among BC youth. Adolescent Health Survey II Fact Sheet* 1998. <[www.mcs.bc.ca/pdf/weight.pdf](http://www.mcs.bc.ca/pdf/weight.pdf)> (Version current at August 4, 2004).
- Maloney MJ, McGuire J, Daniels SR, Specker B. Dieting behavior and eating attitudes in children. *Pediatrics* 1989;84:482-9. Erratum in: 1999;85:814.
- Middleman AB, Vazquez I, Durant RH. Eating patterns, physical activity and attempts to change weight among adolescents. *J Adolesc Health* 1998;22:37-42.
- Neumark-Sztainer D, Story M, Hannan PJ, Perry CL, Irving LM. Weight-related concerns and behaviors among overweight and non-overweight adolescents: Implications for preventing weight-related disorders *Arch Pediatr Adolesc Med* 2002;156:171-8.
- Croll J, Neumark-Sztainer D, Story M, Ireland M. Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: Relationship to gender and ethnicity. *J Adolesc Health* 2002;31:166-75.
- Krowchuk DP, Kreiter SR, Woods CR, Sinal SH, DuRant RH. Problem dieting behaviors among young adolescents. *Arch Pediatr Adolesc Med* 1998;152:884-8.
- Story M, Rosenwinkel K, Himes JH, Resnick M, Harris LJ, Blum RW. Demographic and risk factors associated with chronic dieting in adolescents. *Am J Dis Child* 1991;145:994-8.
- Patton GC, Carlin JB, Shao Q, et al. Adolescent dieting: Healthy weight control or borderline eating disorder? *J Child Psychol Psychiatry* 1997;38:299-306.
- Patton GC, Selzer R, Coffey C, Carlin JB, Wolfe R. Onset of adolescent eating disorders: Population based cohort study over 3 years. *BMJ* 1999;318:765-8.
- Grigg M, Bowman J, Redman S. Disordered eating and unhealthy weight reduction practices among adolescent females. *Prev Med* 1996;25:748-56.
- Patton GC, Johnson-Sabine E, Wood K, Mann AH, Wakeling A. Abnormal eating attitudes in London school girls – a prospective epidemiological study: Outcome at twelve month follow-up. *Psychol Med* 1990;20:383-94.
- Daee A, Robinson P, Lawson M, Turpin JA, Gregory B, Tobias JD. Psychologic and physiologic effects of dieting in adolescents. *South Med J* 2002;95:1032-41.
- Wertheim EH, Paxton SJ, Schutz HK, Muir SL. Why do adolescent girls watch their weight? An interview study examining sociocultural pressures to be thin. *J Psychosom Res* 1997;42:345-55.
- Neumark-Sztainer D, Jeffery RW, French SA. Self-reported dieting: How should we ask? What does it mean? Associations between dieting and reported energy intake. *Int J Eat Disord* 1997;22:437-49.
- Neumark-Sztainer D, Story M, Dixon LB, Murray DM. Adolescents engaging in unhealthy weight control behaviours: Are they at risk for other health-compromising behaviors? *Am J Public Health* 1998;88:952-5.
- Neumark-Sztainer D, Story M, French SA. Covariations of unhealthy weight loss behaviors and other high-risk behaviors among adolescents. *Arch Pediatr Adolesc Med* 1996;150:304-8.
- Boutelle K, Neumark-Sztainer D, Story M, Resnick M. Weight control behaviors among obese, overweight, and non-overweight adolescents. *J Pediatr Psychol* 2002;27:531-40.
- Neumark-Sztainer D, Story M, Falkner NH, Beuhring T, Resnick MD. Sociodemographic and personal characteristics of adolescents engaged in weight loss and weight/muscle gain behaviors: Who is doing what? *Prev Med* 1999;28:40-50.
- Neumark-Sztainer D, Story M, Resnick MD, Blum RW. Lessons learned about adolescent nutrition from the Minnesota Adolescent Health Survey. *J Am Diet Assoc* 1998;98:1449-56.
- French SA, Story M, Neumark-Sztainer D, Downes B, Resnick M, Blum R. Ethnic differences in psychosocial and health behaviour correlates of dieting, purging and binge eating in a population-based sample of adolescent females. *Int J Eat Disord* 1997;22:315-22.
- Van den Berg P, Wertheim EH, Thompson JK, Paxton SJ. Development of body image, eating disturbance and general psychological functioning in adolescent females: A replication using covariance structure modeling in an Australian sample. *Int J Eat Disord* 2002;32:46-51.
- Barker M, Robinson S, Wilman C, Barker DJ. Behaviour, body composition and diet in adolescent girls. *Appetite* 2000;35:161-70.
- Gruber AJ, Pope HG Jr, Lalonde JK, Hudson JI. Why do young women diet? The roles of body fat, body perception, and body ideal. *J Clin Psychiatry* 2001;62:609-11.
- Tremblay MS, Willms JD. Secular trends in the body mass index of Canadian children. *CMAJ* 2000;163:1429-33. Erratum in: 2001;164:970.
- Pesa J. Psychosocial factors associated with dieting behaviours among female adolescents. *J Sch Health* 1999;69:196-201.
- French SA, Leffert N, Story M, Neumark-Sztainer D, Hannan P, Benson PL. Adolescent binge/purge and weight loss behaviors: Associations with developmental assets. *J Adolesc Health* 2001;28:211-21.
- Hill AJ, Pallin V. Dieting awareness and low self-worth: Related issues in 8-year-old girls. *Int J Eat Disord* 1998;24:405-13.
- Fisher M, Schneider M, Pegler C, Napolitano B. Eating attitudes, health-risk behaviours, self-esteem, and anxiety among adolescent females in a suburban high school. *J Adolesc Health* 1991;12:377-84.
- Paxton SJ, Wertheim EH, Pilawski A, Durkin S, Holt T. Evaluations of dieting prevention messages by adolescent girls. *Prev Med* 2002;35:474-91.
- Dixon R, Adair V, O'Connor S. Parental influences on the dieting beliefs and behaviors of adolescent females in New Zealand. *J Adolesc Health* 1996;19:303-7.

34. Byely L, Archibald AB, Graber J, Brooks-Gunn J. A prospective study of familial and social influences on girls' body image and dieting. *Int J Eat Disord* 2000;28:155-64.
35. Baker CW, Whisman MA, Brownell KD. Studying intergenerational transmission of eating attitudes and behaviors: Methodological and conceptual questions. *Health Psychology* 2000;19:376-81.
36. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25:263-71.
37. Neumark-Sztainer D, Story M, Falkner NH, Beuhring T, Resnick MD. Disordered eating among adolescents with chronic illness and disability: The role of family and other social factors. *Arch Pediatr Adol Med* 1998;152:871-8.
38. Neumark-Sztainer D, Story M, Resnick MD, Garwick A, Blum RW. Body dissatisfaction and unhealthy weight-control practices among adolescents with and without chronic illness: A population-based study. *Arch Pediatr Adolesc Med* 1995;149:1330-5.
39. Johnson JG, Cohen P, Korler L, Kasen S, Brook JS. Psychiatric disorders associated with risk for the development of eating disorders during adolescence and early adulthood. *J Consult Clin Psychol* 2002;70:1119-38.
40. Neumark-Sztainer D, Falkner N, Story M, Perry C, Hannan PJ, Mulert S. Weight-teasing among adolescents: Correlations with weight status and disordered eating behaviors. *Int J Obes Relat Metab Disord* 2002;26:123-31.
41. Dunkley TL, Wertheim EH, Paxton SJ. Examination of a model of multiple sociocultural influences on adolescent girls' body dissatisfaction and dietary restraint. *Adolescence* 2001;36:265-79.
42. Paxton SJ, Schutz HK, Wertheim EH, Muir SL. Friendship clique and peer influences on body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. *J Abnorm Psychol* 1999;108:255-66.
43. Gilbody SM, Kirk SF, Hill AJ. Vegetarianism in young women: Another means of weight control? *Int J Eat Disord* 2000;26:87-90.
44. Sherwood NE, Neumark-Sztainer D, Story M, Beuhring T, Resnick MD. Weight-related sports involvement in girls: Who is at risk for disordered eating? *Am J Health Promo* 2002;16:341-4, ii.
45. Koff E, Rierdan J. Advanced pubertal development and eating disturbance in early adolescent girls. *J Adolesc Health* 1993;14:433-9.
46. French SA, Story M, Downes B, Resnick MD, Blum RW. Frequent dieting among adolescents: Psychosocial and health behavior correlates. *Am J Public Health* 1995;85:695-701.
47. French SA, Perry CL, Leon GR, Fulkerson JA. Weight concerns, dieting behavior, and smoking initiation among adolescents: A prospective study. *Am J Public Health* 1994;84:1818-20.
48. French SA, Jeffery RW. Consequences of dieting to lose weight: Effects on physical and mental health. *Health Psychol* 1994;13:195-212.
49. Howard CE, Porzelius LK. The role of dieting in binge eating disorder: Etiology and treatment implications. *Clin Psychol Rev* 1999;19:25-44.
50. Lifshitz F, Moses N, Cervantes C, Ginsberg L. Nutritional dwarfing in adolescents. *Semin Adolesc Med* 1987;3:255-66.
51. Pugliese M, Lifshitz F, Grad G, Fort P, Marks-Katz M. Fear of obesity. A cause of short stature and delayed puberty. *N Engl J Med* 1983;309:513-8.
52. Dietz WH Jr, Hartung R. Changes in height velocity of obese preadolescents during weight reduction. *Am J Dis Child* 1985;139:705-7.
53. Selzer R, Caust J, Hibbert M, Bowes G, Patton G. The association between secondary amenorrhea and common eating disordered weight control practices in an adolescent population. *J Adolesc Health* 1996;19:56-61.
54. Kriepe RE, Forbes GB. Osteoporosis: A new morbidity for dieting female adolescence? *Pediatrics* 1990;86:478-80.
55. Johnson J, Whitaker AH. Adolescent smoking, weight changes, and binge-purge behavior: Associations with secondary amenorrhea. *Am J Public Health* 1992;82:47-54.
56. Kriepe RE, Strauss J, Hodgman CH, Ryan RM. Menstrual cycle abnormalities and subclinical eating disorders: A preliminary report. *Psychosom Med* 1989;51:81-6.
57. Turner JM, Bulsara MK, McDermott BM, Byrne GC, Prince RL, Forbes DA. Predictors of low bone density in young adolescent females with anorexia nervosa and other dieting disorders. *Int J Eat Disord* 2001;30:245-51.
58. Polivy J. Psychological consequences of food restriction. *J Am Diet Assoc* 1996;96:589-92.
59. Cameron JW. Self-esteem changes in children enrolled in weight management programs. *Issues Compr Pediatr Nurs* 1999;22:75-85.
60. Stice E, Cameron RP, Killen JD, Hayward C, Taylor CB. Naturalistic weight-reduction efforts prospectively predict growth in relative weight and onset of obesity among female adolescents. *J Consult Clin Psychol* 1999;67:967-74.
61. National Task Force on the Prevention and Treatment of Obesity. Dieting and the development of eating disorders in overweight and obese adults. *Arch Intern Med* 2000;160:2581-9.
62. Neumark-Sztainer D, Butler R, Palti H. Dieting and binge eating: Which dieters are at risk? *J Am Diet Assoc* 1995;95:586-9.
63. Field AE, Austin SB, Taylor CB, et al. Relation between dieting and weight change among preadolescents and adolescents. *Pediatrics* 2003;112:900-6.
64. Canada's Food Guide to Healthy Eating. <[www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/food\\_guide\\_rainbow\\_e.html](http://www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/food_guide_rainbow_e.html)> (Version current at August 4, 2004).
65. Canadian Paediatric Society, Healthy Active Living Committee. Healthy active living for children and youth. *Paediatr Child Health* 2002;7:339-45.
66. Sacks D, Westwood M. An approach to interviewing adolescents. *Paediatr Child Health* 2003;8: 554-6.
67. Canadian Paediatric Society, Nutrition Committee. Use of growth charts for assessing and monitoring growth in Canadian infants and children: Executive Summary. *Paediatr Child Health* 2004;9:171-3.
68. Westwood M, Baltzer F. Eating disorders and the practicing physician. *Paediatr Child Health* 2002;7:313-4.
69. Canadian Paediatric Society Adolescent Medicine Committee. Eating disorders in adolescents: Principles of diagnosis and treatment. *Paediatr Child Health* 1998;3:189-92.
70. Barlow SE, Dietz WH. Obesity evaluation and treatment: Expert committee recommendations. *Pediatrics* 1998;102:e29.
71. Berall GB. Obesity: A crisis of growing proportions. *Paediatr Child Health* 2002;7:325-8.
72. Brown WM, Sibille K, Phelps L, McFarlane KJ. Obesity in children and adolescents. *Clin Fam Practice* 2002;3:603-21.

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**Principal author:** Dr Sheri Findlay, McMaster's Children's Hospital – Hamilton HSC, Hamilton, Ontario

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The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate.