Recommendations:

- Achieving and maintaining a healthy growth pattern, where weight is not in excess of height, is recommended during childhood and adolescence to reduce the risk of obesity-related complications, such as cardiovascular disease, type 2 diabetes, certain types of cancer, orthopedic issues, depression and low-self esteem.
- Using the Canadian Pediatric Endocrine Group (CPEG) gender-specific body mass index (BMI)- for-age percentile growth charts (2012), a healthy growth pattern for children and adolescents is defined as a BMI-for-age trend that falls between the 5th and 85th percentiles.
- Three key components to a pediatric weight management approach include: nutrition; physical activity in combination with decreased sedentary activity; and health change counselling with the parents/ caregivers and child or adolescent.
- A diet meeting the recommended number of servings from *Eating Well with Canada's Food Guide* and appropriate in energy is recommended for overall healthy growth and development.
- Incorporate at least three balanced meals per day, including breakfast and healthy snacks.
- High-fibre foods contribute to earlier satiety and more sustained feelings of fullness than low-fibre foods. Aim for the age-specific recommended number of servings of Vegetables and Fruit and whole Grain Products.
- For children older than 2 years of age, incorporate low fat Milk and Alternatives in order to meet nutritional requirements for calcium and vitamin D.
- At least 60 minutes of moderate to vigorous activity per day for children 5 – 17 years, and at least an accumulated 180 minutes of physical activity of any intensity for children 2 – 4 years is recommended. Encourage clients/families to work towards these recommendations if physical activity is low.

Health Benefits

A decrease or maintenance of weight in the overweight and obese pediatric population can result in reduced:[1]

- risk of obesity and its complications in adulthood.
- risk factors for type 2 diabetes and cardiovascular disease.
- blood pressure in hypertensive and pre-hypertensive individuals.
- blood glucose levels in individuals with diabetes and pre-diabetes.
- serum triglyceride, cholesterol and LDL cholesterol levels.
- risk for certain types of cancer.
- risk for non-alcoholic fatty liver disease.
- risk for breathing difficulties and obstructive sleep apnea.
- risk of menstrual abnormalities and polycystic ovarian syndrome.
- risk for depression, anxiety and eating disorders.
- risk for orthopedic disorders.
- occurrence of psychosocial problems (e.g. social discrimination, low self-esteem, depression) related to excess weight.

Key Questions

What is a healthy growth pattern for children and adolescents?

A healthy growth pattern for children and adolescents is defined as a BMI-for-age pattern that is >5th and <85th percentile using the CPEG (2012) growth charts.[2]

The recommended cut-off criteria for clients 2-19 years are as follows: ◊

Indicator	Percentile Cut-Off Point		Growth Concern for Health Professional Reference Only	Key Messages for Families
	2-5 years*	5-19 years		
BMI-for-age	>85	NA	Risk of overweight	**Weight may be ahead of height*** **
	>97	>85	Overweight	
	>99.9**	>97	Obese	
	NA	>99.9**	Severely Obese	

◊cut-offs are adapted from the WHO growth charts cut-off criteria[3]
*up to but not including 5 years of age
**The extreme outer percentile line (99.9) is not displayed on the CPEG growth charts.[4]However, the 99.9th percentile is still identified as a cut-off when using World Health Organization data[5] and may be useful in clinical settings.
***Plot height and weight to determine if percentiles are disproportionate prior to discussion with family.

What is the prevalence of overweight and obesity?

In 2004, 18% of children and adolescents in Canada aged 2 to 17 years were overweight, and 8% were obese. This is an increase from 12% and 3%, respectively, in 1978/79.[6]

What causes obesity?

Obesity is a multi-factorial condition determined by genetic and non-genetic factors. At least 250 obesity-associated genes have been identified. In most cases, environmental factors cause genetic predispositions to manifest.[7]

Non-genetic factors that may increase a client's risk of becoming overweight or obese include an unhealthy intake, limited physical activity and increased sedentary behaviour. However, the impact of these risk factors on the development of overweight is affected by the individual characteristics including age, gender, and susceptibility to weight gain and also by parenting styles, family characteristics, and community and societal influences. The family environment is believed to have the strongest impact on a child's development of dietary habits and lifestyle practices, with caregiver(s) and children both influencing each other.[8] Bear in mind that caregivers are not solely responsible for their child's weight status or increasing weights of children as many social and environmental factors have concurrently changed alongside the rising rate of obesity.[9]

The rapid rise in obesity rates over the past twenty years in genetically stable populations confirms the environment as the strongest factor leading to obesity. Thus, more research is needed to understand the complex interaction between our environment and obesity.[7]

How is risk for overweight and obesity determined?

It is recommended that a client's BMI be calculated and plotted on the appropriate gender specific growth chart.[1]

Although the client's BMI does not determine body fat or health risks it should be used as an initial screen with clinical judgment and information to understand the client's overall health and the most appropriate intervention.[2] It is important to note that a growth pattern over time is more important than one single measurement. One measurement only identifies the client's size at that point in time and does not provide enough information to assess overall growth.

To determine BMI-for-age percentile:

- Obtain a measured height (in centimetres).
- Obtain a measured weight (in kilograms).
- Calculate BMI using the formula: BMI = weight in kilograms/(height in meters squared).[10,11]
- Plot BMI-for-age on the gender-specific CPEG growth charts.

Should waist circumference be measured?

Waist circumference (WC) is a good predictor of adiposity and risk level for heart disease in children and adolescents.[1] Several studies have shown waist circumference to be a predictor of coronary artery disease risk factors and hyperinsulinemia in children and adolescents.[2,12,13,14] However, using waist circumference as a sole predictor or independent measure for obesity and/or obesity related co-morbidities is not recommended[10] because WC is highly age-, ethnic- and gender-dependent.[15,16] WC can be used together with height measurements to calculate a waist-to-height ratio(explained below). This ratio provides further information to assess cardiometabolic risk.[1]

To help improve accuracy and reduce error when taking WC measurements in clients, standards for WC measurement techniques have been developed.[17] Only recently was the development of WC percentiles for Canadian youth undertaken, though this was specifically for ages eleven to eighteen.[18] It is critical that pediatric reference ranges be used to ensure accuracy of care and messaging with families. WC is a sensitive measurement for clients, thus taking extra care to decrease anxiety, worry and embarrassment is strongly recommended.

Why Calculate Waist-to-Height Ratio?

Recently, weight-to-height ratios (WtHR) have been studied to help predict cardiometabolic risk in children and adolescents and have shown to be a good indicator for cardiometabolic risk.[19] A WtHR of 0.5, or keeping ones waist circumference to less than half of their height, was found to be a suitable global boundary value.[19] This means a child or adolescent whose WtHR is above 0.5 would be at greater cardiometabolic risk, thus indicating further cardiometabolic assessment by a physician.

To determine the waist-to-height ratio:[19]

- Obtain a measurement of height (in centimetres)
- Obtain waist circumference measurement (in centimetres)
- Calculate WtHR = waist circumference (cm)/ height (cm)

How often should a client be weighed and measured?

Caregivers, clients, and health professionals are cautioned against measuring anthropometrics excessively, as this can over-emphasize weight and height changes as the sole outcomes and minimize more important improvements in living a healthier lifestyle. Healthy lifestyle changes may precede weight changes and are stronger predictors for long term success.[10]

The American Medical Association recommends that health professionals monitor weight and height once a month during the treatment of childhood and adolescent obesity.[10] However, if the client is younger and does not attend appointments regularly with the caregiver, anthropometrics may be taken less frequently.

Being measured for weight can be embarrassing and anxiety-provoking, especially for clients who may be sensitive about their measurements. It is very important for health professionals to ask permission before taking anthropometrics and use sensitivity when measurements are taken and being discussed.[1,10]

How can you asses a client's or family's readiness to make behaviour change?

Health care professionals should assess a person's readiness, confidence, internality, and barriers to change behaviours prior to implementing a healthy lifestyle plan. It is important to reassess readiness for each behaviour/change and throughout the program to identify strategies that encourage progression through the stages of change.[1] Keep in mind that families and/or clients can be in different stages of change depending on the change they are implementing. *Prochaska's Trans- Theoretical Model* can be used to determine which stage of change the client and/or family is in. The model includes the following stages of change:[20]

Pre-contemplation: The caregiver(s) and/or child is unaware of the need to change or are not considering change and do not intend to change in the near future. Aim to highlight benefit of change and have the family consider change in a non-defensive manner.

Contemplation: The caregiver(s) and/or child are becoming more aware of the problem and are potentially exploring the costs and benefits of changing. Discover what the caregiver's and/or child's barriers and challenges are and help them explore these.

Preparation: The caregiver(s) and/or child have considered changing behaviours and are actively preparing for change within the month. Although behaviours have not yet changed, they are taking steps toward change. Interventions should be supportive and encouraging to foster acceptance of change.

Action: The caregiver(s) and/or child have begun to change their behaviours in the short term (up to 6 months since changes were made). Focus interventions on reinforcing the change, problem-solving and planning for barriers to continue change.

Maintenance: The caregiver(s) and/or child have changed their behaviours and maintained changes for more than 6 months. Target interventions at increasing or maintaining self-efficacy and developing strategies to cope with set-backs and relapses.

Recycling (learning from relapse): The caregiver(s) and/or child returns from any given stage to an earlier stage which provides an opportunity for learning through trial and error.

Termination (no relapse): The caregiver(s) and/or child have established lifestyle changes and no longer take part in previous behaviours.

In addition to stage of change, health professionals should help clients and/or families assess their current level of confidence in performing the specific behaviours. The following may be used:

- At the pre-contemplation/ contemplation stages of change it can be helpful to explore with the client and/or caregiver(s) the pros and cons to change. The cons can provide insight of potential barriers that may require further discussion before change can begin. NOTE: Working on barriers is change itself.
- Identify specific barriers to implementing and maintaining the healthy behaviour.
- Use this information to explore and assist with identifying solutions that the caregiver(s) and/or client can practice in these situations.

What is the best treatment for weight management in children and adolescents?

The best treatment for obesity in the pediatric population has not yet been defined; however, a treatment that addresses all modifiable factors is recommended. Increasing physical activity and promoting adequate daily intakes of vegetables, fruits and whole grains have been shown to decrease the risk of all diet-related chronic diseases (including overweight and obesity).[1,11,21] It is also important to take into consideration the mental health of each client and family when discussing and creating the best treatment plan.

Clinicians should be aware of clients who present with anxiety, depression, body dissatisfaction, flat affect and a lower quality of life.[10] NOTE: It is important to address any underlying contributors to eating and activity levels during pediatric weight management or prior to starting interventions.

What treatments should be provided in a primary care setting?

In a primary care setting, the first-line treatments for clients that are over the 85th BMI percentile for age are: a healthy balanced diet and regular physical activity.

The diet, physical activity and health change counselling components of this Nutrition Guideline provide appropriate first-line strategies for the management of pediatric overweight and obesity.

Outcomes of these primary interventions should be evaluated every 3 to 6 months.[10] On-going follow-up with health professionals specifically trained in pediatric weight management should focus on lifestyle changes and continue for at least three months.[1] Follow-up should include nutrition, physical activity and health change components.[1,7,10]

Targeting and reinforcing health changes in caregiver(s), as well as their children, is more effective than targeting children and adolescents alone. Positive parent-training techniques may be a beneficial adjunct to multi-component programs.[11,21]

What first-line lifestyle interventions can be provided in a primary care setting?

The following first-line interventions can be implemented for prevention or management in a primary care setting:[10]

Nutrition Interventions

- Increase awareness of hunger and satiety cues.
- Eat the minimum number of Vegetables and Fruit servings recommended in *Eating Well with Canada's Food Guide* for age and gender. If not meeting recommendations, target ways to include vegetables and fruit more often.
- Limit sugar-sweetened beverages.
- Have regular family meals including breakfast everyday at the table with the TV turned off[22]
- Limit eating out, especially at fast-food establishments.
- Education about appropriate meal patterns (i.e. 3 meals a day with 2-3 snacks).
- Education about portion sizes (see below).

Despite what intervention is first targeted, it is important to focus on overall healthy eating, rather than a caloric deficit.

Physical Activity Interventions[23]

Age	Activity Level	Time	Sedentary Time
2-4 years	Any intensity	180 min/day	Less than 1 hour / day
5-17 years	Moderate - vigorous	60 min/day	2 hours / day max

Taking small steps that build overtime to get a client or family closer to recommendations would be a more sustainable approach for lifestyle change. See questions below for more information on each of these nutrition and physical activity interventions.

What role does portion size play in weight management?

Guidance and education around the serving sizes outlined in *Eating Well with Canada's Food Guide* is important to ensure clients are meeting their daily nutrient needs for proper growth and development.[24] NOTE: It is important to explore a caregiver(s) and/or client's readiness and motivation prior to initiating an intervention or providing information.

A trial that compared two studies with a modified *Stoplight Diet for Children* found that an emphasis on increasing healthy foods over decreasing high energy foods has been associated with more effective improvements in weight status over a longer period of time. This was also linked with less parental restriction on their child's intake, a decreased emphasis on weight and no weight gain relapse.[25]

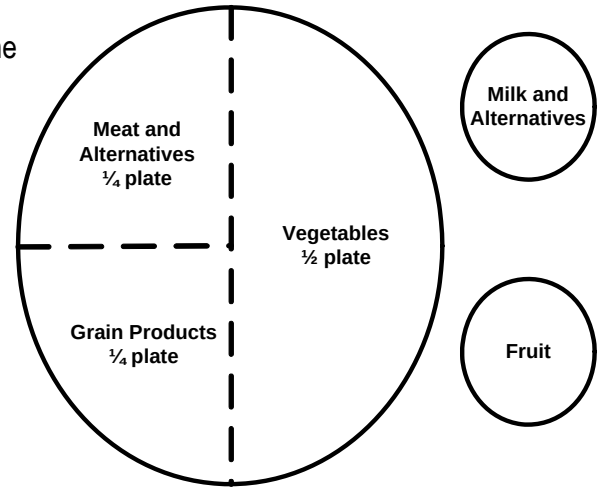
There is a general tendency for individuals to underestimate portion sizes; this can result in an energy intake above an individual's needs. This is partially influenced by the portion sizes served in the restaurant industry, which have become increasingly larger.

What does a healthy meal look like?

A healthy meal includes one food from at least three of the four food groups from *Eating Well with Canada's Food Guide*.

Some find it helpful to use the healthy plate model when planning their meals:

- Fill ½ of the plate with Vegetables
- Fill ¼ of the plate with Meat and Alternatives (e.g. lean meat, fish, tofu, eggs, nuts)
- Fill ¼ of the plate with Grain Products
- Have 1 serving of Milk and Alternatives (e.g. a cup of milk)
- Have fruit on the side



Regardless of weight, it is encouraged that all children and adolescents follow *Eating Well with Canada's Food Guide* to meet their minimum nutrition needs. *Eating Well with Canada's Food Guide* serving recommendations are:

Age (years)	Vegetables and Fruit	Grain Products	Milk and Alternatives	Meat and Alternatives
2 – 3	4	3	2	1
4 – 8	5	4	2	1
9 – 13	6	6	3 – 4	1 – 2
14 – 18 (female)	7	6	3 – 4	2
14 – 18 (male)	8	7	3 – 4	3

For reference of serving size definitions visit www.healthcanada.gc.ca/foodguide

The *Alberta Nutrition Guidelines for Children and Youth (ANGCY)*[14] can be used to guide healthier food choices. The ANGCY places foods in three categories, based on specific nutritional criteria. The three categories include Choose Most Often, Choose Sometimes and Choose Least Often.[14] The ANGCY can be accessed online at: http://www.healthyalberta.com/1141.htm.

Why limit sugar-sweetened beverages?

Beverages sweetened with added sugar, such as iced tea, pop and fruit drinks/punch, can contribute significantly to daily energy intake without providing nutrients. Encourage nutritive beverages such as water, milk and 100% fruit juice over sugar-sweetened beverages. Low-calorie or calorie-free beverages are not recommended for clients under 10 years of age as minimal research has been done regarding the safety of artificial sweeteners for clients of this age.[21,24]

Limit 100% fruit and vegetable juice consumption to ½ cup (125 mL) per day.[26] Clients who consume large amounts of juice per day may be at increased risk of becoming overweight.[21] Fruit and vegetable juices are lower in fibre than whole vegetables and fruits. Fibre is associated with higher levels of satiety thus, needing less food to feel full.[27] Therefore, clients are encouraged to choose whole vegetables and fruit instead of juice.

Why are regular family meals recommended?

Adolescents who eat more meals with their family tend to have an increased intake of fruits, vegetables, grains, and calcium-rich foods and reduced consumption of soft drinks.[28] These behaviours were shown to continue for 5 years, suggesting that family meals during adolescence may have a lasting positive influence on dietary quality and meal patterns in young adulthood.[29] Although the practice of regular family meals has not consistently been found to protect against obesity, it does seem to protect against disordered eating, particularly in adolescent girls.[1]

Therefore it is recommended that families:[21]

- Eat meals together regularly
- Include structured meals every day (i.e. breakfast, lunch and dinner).
- Encourage clients to eat breakfast.
- Include structured daily snacks (1 or 2 snacks per day) comprised of nutrient-rich foods. Limit energy-dense, lower-nutrient snack food choices

Many caregiver(s) feel badly about not having enough family meals, so it is important to address this topic in a sensitive and nonjudgmental manner.[30]

Why should families and/or clients limit meals eaten outside the home?

It is recommended that families limit meals consumed outside the home to less than twice week.[21] Children who eat more fast food also consume more total fat and sugar as well as less fibre, fruits, vegetables and milk products. These factors alongside larger portion sizes at restaurants may increase total energy intake.[1] Health professionals can help families and/or clients develop strategies to decrease reliance on meals eaten away from home.

What role does fibre play in weight management?

Fibre can play an important role in weight management because:[27]

- Foods high in fibre are associated with higher levels of satiety and, therefore, individuals may require less food to feel full.
- The body takes longer to digest high-fibre foods and, therefore, the feeling of fullness lasts longer than with lower fibre foods.

Families and/or clients are encouraged to include adequate daily amounts of dietary fibre from vegetables, fruit, whole grain products, and legumes.

Recommended fibre intakes are as follows:

Dietary Reference Intake (DRI) for Fibre[31]		
Age	**Boys**	**Girls**
1 – 3 years	19 grams per day	19 grams per day
4 – 8 years	25 grams per day	25 grams per day
9 – 13 years	31 grams per day	26 grams per day
14 – 18 years	38 grams per day	26 grams per day

What is the role of calcium and dairy products in pediatric weight management?

Some studies have suggested that regular, adequate intake of calcium, vitamin D and milk products may reduce risk for overweight in adults.[32,33,34] However, the role of these nutrients and foods in pediatric weight management has not been proven.

It is recommended all clients eat the appropriate number of *Eating Well with Canada Food Guide* servings per day of low fat Milk and Alternatives (2 servings for ages 2 to 8 years; 3 to 4 servings for ages 9 to 18 years).

There is evidence to suggest that clients in the overweight or obese categories are at-risk of vitamin D deficiency and require extra supplementation. However, there is no evidence that is conclusive enough to make a recommendation on the dosage for this population.[35,36,37]

Is there an appropriate total calorie level for weight loss?

As a first step, clients and their families should focus on basic lifestyle eating and activity habits rather than calorie restrictions.[10] Severe caloric restriction is not recommended in the pediatric population (refer to the section *What diets are not recommended?*).

If intervention beyond the scope of a primary care setting is required (Refer to section *What first-line lifestyle interventions can be provided in a primary care setting?*), a nutritionally balanced diet should be combined with other supportive interventions.[1] The optimal dietary plan should be developed by a qualified and experienced health professional (e.g. Registered Dietitian) together with the individual and family.[1]

What is safe weight maintenance or reduction?

Safe weight velocities according to BMI-for-age categories:[10,21]

Age (in years)	BMI Category	Safe Reduction and Growth Outcomes *(realistic individual weight reductions will vary based on family factors)*
2 – 5	85th to 96th %ile with no health risks	• Weight velocity maintenance (prevent worsening of overweight) • Maintain linear growth velocity
	85th to 96th %ile with health risks	• Weight maintenance or slowed weight gain (resulting in decreasing BMI) • Maintain linear growth velocity
	≥97th %ile	• Weight maintenance (in children with BMI >21, consider loss of up to 0.45 kg (1 lb) per month) • Maintain linear growth velocity
6 – 11	85th to 96th %ile with no health risks	• Weight velocity maintenance (prevent worsening of overweight) • Maintain linear growth velocity
	85th to 96th %ile with health risks	• Weight maintenance (prevent worsening of overweight) • Maintain linear growth velocity
	97th to 99.9th %ile	• Weight loss of up to 0.45 kg (1 lb) per month • Maintain linear growth velocity
	>99.9th %ile	• Weight loss of a maximum of 0.9 kg (2 lb) per week (3.6 kg (8 lb) per month) • Maintain linear growth velocity
12 – 18	85th to 96th %ile with no health risks	• Weight velocity maintenance; after linear growth is completed, weight maintenance • Maintain linear growth velocity
	85th to 96th %ile with health risks	• Weight maintenance or gradual weight loss (0.45 kg (1 lb) per month) • Maintain linear growth velocity
	97th to 99.9th %ile*	• Weight loss maximum 0.9 kg (2 lb) per week (3.6 kg (8 lb) per month) • Maintain linear growth velocity

Adapted from the Weight Goals and Intervention Stages, According to Age and BMI Categories
*The extreme outer percentile line (99.9) is not displayed on the CPEG growth charts. However, it is still identified as cut-off when using World Health Organization data (e.g. for 6-11 years of age, the 99.9th percentile is the cut-off may be associated with different growth outcomes) and may be useful in clinical settings.

What outcomes, other than weight, should be used to measure success?

Results from systematic reviews suggest monitoring for improvements in the following indicators:[38]

- Changed eating behaviour (e.g. slower pace of eating, improved food choices, improved meal planning and cooking habits, establishment of regular meal and snack times, more family meals, eating breakfast)
- Increased awareness of hunger and satiety cues.
- Increased capacity for self-regulation
- Increased participation and enjoyment in regular physical activity
- Improved exercise capacity and endurance
- Reduced time spent on sedentary activities
- Improved self-esteem, confidence and/or body-image
- Improved quality of life
- Improved family functioning
- Reduction in metabolic risk factors (e.g. serum cholesterol, insulin, glucose, blood pressure)

What diets are not recommended?

There are few studies looking at very low calorie diets (VLCD), protein-sparing modified fasts (PSMF) and low energy diets (LED) in pediatric obesity treatment. A small number of studies investigating these diets have demonstrated significant weight loss;[39,40] however, outcomes of post-treatment long-term follow-up beyond are not available. In addition, not enough is known about high protein diets and low glycemic index diets.

Until more research is available, VLCD, PSMF, LED, high protein and low glycemic index diets are not recommended. Focusing on healthy lifestyle changes is optimal.[1]

Are there any recommended herbal supplements, teas or over the counter diet pills for weight loss?

Weight maintenance and/or loss through healthy lifestyle changes is optimal. There are no recommended supplements for pediatric weight management.[21]

What is the risk of eating disorders in the context of treating pediatric overweight and obesity?

Current studies suggest low incidence of eating disorders when interventions are supervised and administered by trained health care providers.[1] However, it is important to refer to psychosocial support where needed.

The following recommendations for health care providers have been made for prevention of obesity and eating disorders in adolescents:[30]

- Encourage positive eating habits and physical activity that can be maintained for a longer period of time. Discuss with clients and caregiver(s) that dieting, and particularly unhealthy weight control behaviours, can be unsafe and may make weight management more difficult.

- Do not use body dissatisfaction as a motivator for change. Instead, help clients care for their bodies so that they will want to nurture them through healthy eating, physical activity, and positive self-talk.
- Encourage families to have regular, enjoyable meals together.
- Encourage families to talk less about weight and to encourage positive lifestyle changes.
- Encourage parents to be positive roles models in their behaviours and thoughts about their bodies.
- Recognize overweight clients may have experienced negative social consequences because of weight and address this issue with them and their families.

What is the recommended amount of physical activity for weight management?

An increase in daily physical activity is associated with decreasing relative BMI for girls (0.06 kg/m^2 less for every 1 hour increase in activity) and for boys (0.22 kg/m^2 less for every 1 hour increase in activity).[41]

Physical activity should be included along with dietary and behaviour counselling for reducing overweight.[11,42,43]

- Encourage clients to increase the amount of time spent being physically active.
- Encourage clients to decrease the time spent doing sedentary activities (e.g. television, video and computer games, internet) by 30 minutes per day.
- Physical activity should include a combination of moderate activity (such as brisk walking, skating and bike riding) and vigorous activity (such as running and playing soccer). This increase should be accumulated in periods of at least 5 to 10 minutes each.
- Clients aged 2 – 4 years should accumulate at least 180 minutes of physical activity at any intensity spread throughout the day, including a variety of activities in different environments and activities that develop movement skills.
- For health benefits, clients aged 5 – 17 years should accumulate at least 60 minutes of moderate to vigorous intensity physical activity daily. This includes vigorous activities at least 3 days per week, and activities that strengthen muscle and bone at least 3 days per week. More daily activity provides greater health benefits.[23]
- Promote physical activity opportunities that include team, individual, non-competitive and lifetime sports and recreational activities. Focus on fun.

Refer to the *Canadian Physical Activity and Canadian Sedentary Behaviour Guidelines,* available at: www.csep.ca/guidelines.

Steps per day can be measured by a pedometer. It has been suggested that the steps-per-day separating normal weight and overweight/obese children ages 6 to 12 years are as follows:

- 12,000 steps per day for girls
- 15,000 steps per day for boys

However, there are still no clearly defined number of steps per day recommended for weight management in children and adolescents.[44]

Why should sedentary activities be limited?

Increased time spent in sedentary activity (television, video games and computer use) and overall decreases in daily physical activity are contributing to the increased incidence of overweight and obesity.[42] Higher levels of inactivity are correlated with increased BMI in girls (0.05 kg/m^2 more for every 1 hour increase in screen time).[45]

Physical activity counselling should include strategies to reduce the amount of time doing sedentary activity. Children and adolescents aged 5 – 17 years should limit recreational time spent on TV, video, computer games and internet (sedentary activities) to no more than 2 hours per day. Children 2-4 years should be limited to less than 1 hour of screen time per day.[23] To help with this, televisions should be removed from children and adolescents' bedrooms and mealtimes.[10] Spending less time being sedentary can maintain a healthy body weight, improve self-confidence and fitness, help children do better in school, increase enjoyment with friends and enable more time to learn new skills.[23]

Refer to the *Canadian Physical Activity and Canadian Sedentary Behaviour guidelines,* available at: www.csep.ca/guidelines.

What is behaviour change counselling?

Behaviour change counselling is thought to be a cornerstone of weight management and includes a combination of strategies, including:[46]

- Family and self-monitoring – keeping a detailed record of specific behaviours such as daily food and activity records.
- Stimulus control – modifying the environment to enhance healthy behaviours such as limiting or decreasing the amount of lower-nutrient dense foods in the home.
- Problem-solving – helping families and/or clients to explore barriers to change, discuss solutions collaboratively, create goals to implement interventions and evaluate effectiveness of the intervention.
- Cognitive restructuring – recognizing and modifying thoughts and beliefs related to weight and behaviours.
- Social support – family, friends and health care practitioners play an important role in helping families maintain their motivation.
- Stress management – enjoyable activity or relaxation exercises can replace the need for less healthy coping mechanisms.
- Contingency management – a healthy, non-food related reward system.

Are medications or surgery appropriate to address pediatric weight management?[1]

In addition to lifestyle interventions, there may be some medication options appropriate for some adolescents with obesity. However, there is less evidence available for pharmaceutical treatments than for lifestyle interventions. Individuals should be referred to their physician for more information regarding these treatments. Pharmaceutical treatment for prepubescent children with obesity should only be considered within the context of a supervised clinical trial. Bariatric surgery may be appropriate for adolescents in exceptional cases only. Individuals should be referred to their physician for more information regarding this treatment.

What role does adequate sleep play in weight management?

Inadequate sleep or fatigue may be a barrier to eating breakfast, physical activity, and other healthy behaviours. Inadequate sleep is also a risk factor for obesity, especially in young clients.[47],[48]
Basic sleep hygiene principles include:[49]

- Consistent bed and wake time
- Quiet, dark and warm bedroom
- Adequate daytime exercise and reduced sedentary time
- Limited screen time
- Removal of electronics from the bedroom
- Reduction of caffeine intake, including no late afternoon or evening caffeine intake
- Limiting screen time directly before bed (e.g. turning off electronics 60 minutes prior to going to bed)

Where can I get more information about weight management recommendations?

Canadian Obesity Network: http://www.obesitynetwork.ca

Alberta Health Services' Pediatric Weight Management Resources:
http://www.albertahealthservices.ca/4769.asp

Alberta Health Services' Provincial Pediatric Weight Management Referral Form:
http://www.albertahealthservices.ca/8358.asp

Dietitians of Canada: www.dietitians.ca

Handouts

Refer to approved provincial Alberta Health Services pediatric weight management nutrition handouts to support patient education. For more information, contact Nutrition.Resources@albertahealthservices.ca

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