

# Managing obesity in childhood and adolescence

By helping young people and their families understand and put into practice positive lifestyle changes, clinicians can have a significant impact on childhood and adolescent obesity.

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The prevalence of obesity has increased dramatically in both adults and children and the condition is now recognised by the World Health Organization as a major epidemic.<sup>1,2</sup> Obesity can be considered both as a disease, with its own significant morbidity and mortality, and as a risk factor for other noncommunicable diseases, including type 2 diabetes and cardiovascular disease.

Overweight and obesity in childhood and adolescence are significant and increasingly prevalent conditions in Australia. Nationally representative surveys from 1995 and 1997 showed that 19 to 23% of children in Australia were overweight or obese.<sup>3,4</sup> Furthermore, the prevalence of combined overweight and obesity in children had almost doubled between 1985 and 1995, and that of obesity alone had more than tripled.<sup>3</sup> It is likely that these prevalence rates will continue to increase, given

the increased energy intake from high energy foods and drinks and that physical activity levels are continuing to decrease (due in part to the impact of television, internet and computer games).<sup>3</sup>

Obesity in childhood and adolescence is associated with a range of medical and psychosocial complications that can be present in childhood, or may develop in the medium to long term (Table 1).<sup>2,5</sup> Obesity in childhood is also a major risk factor for obesity in adulthood, with all its attendant complications. Therefore, effective management of established overweight and obesity is vital.

Family doctors are well placed to regularly monitor the weight status of children and adolescents and to develop appropriate management plans for those identified as being overweight or obese. The Australian NHMRC's *Clinical practice guidelines for the management of overweight and*

## IN SUMMARY

- Obesity is a chronic disorder of energy imbalance. Focus on both sides of the energy balance equation: energy in and energy out.
- Measure the child or adolescent's body mass index (BMI) and plot it on a BMI-for-age chart. Also measure and record waist circumference.
- Use a developmentally sensitive approach. With children, focus on the parents as agents of change; with adolescents, provide the opportunity for the adolescent and parents to attend therapy sessions separately.
- Long term behavioural change is required, involving an increase in incidental physical activity, a reduction in sedentary behaviour (including TV viewing and other forms of passive electronic entertainment) and a sustainable change to a lower energy intake.
- In prepubertal children, weight maintenance or reduction in the rate of weight gain are appropriate goals of therapy; after puberty, weight loss is generally appropriate.
- High risk eating patterns include skipping breakfast, excessive consumption of soft drinks, cordials and fruit juices, large portion sizes and frequent snacking.

*obesity in children and adolescents* provides information for clinicians on how to treat this problem, and a guide for GPs derived from this provides a practical eight-step summary.<sup>6</sup> The flowchart on page 48 list these steps.<sup>7</sup>

### Raising the issue of obesity

Obesity is an extremely sensitive issue for children and adolescents and their families, and needs to be handled accordingly. A child or adolescent is often aware of his or her weight problem but may find it difficult to ask for help. GPs should raise this issue in a sensitive manner with the parents of preadolescent children and with the adolescents themselves. Some families or young people will already be aware of the problem, and will be ready to make the necessary lifestyle changes. Others may need more time to consider the issues and decide whether they are ready to make lifestyle changes. In this situation, the family doctor can help educate the family and young person about the medical and psychosocial issues associated with obesity in childhood and adolescence and offer future support when there is a decision to seek help at a later time.

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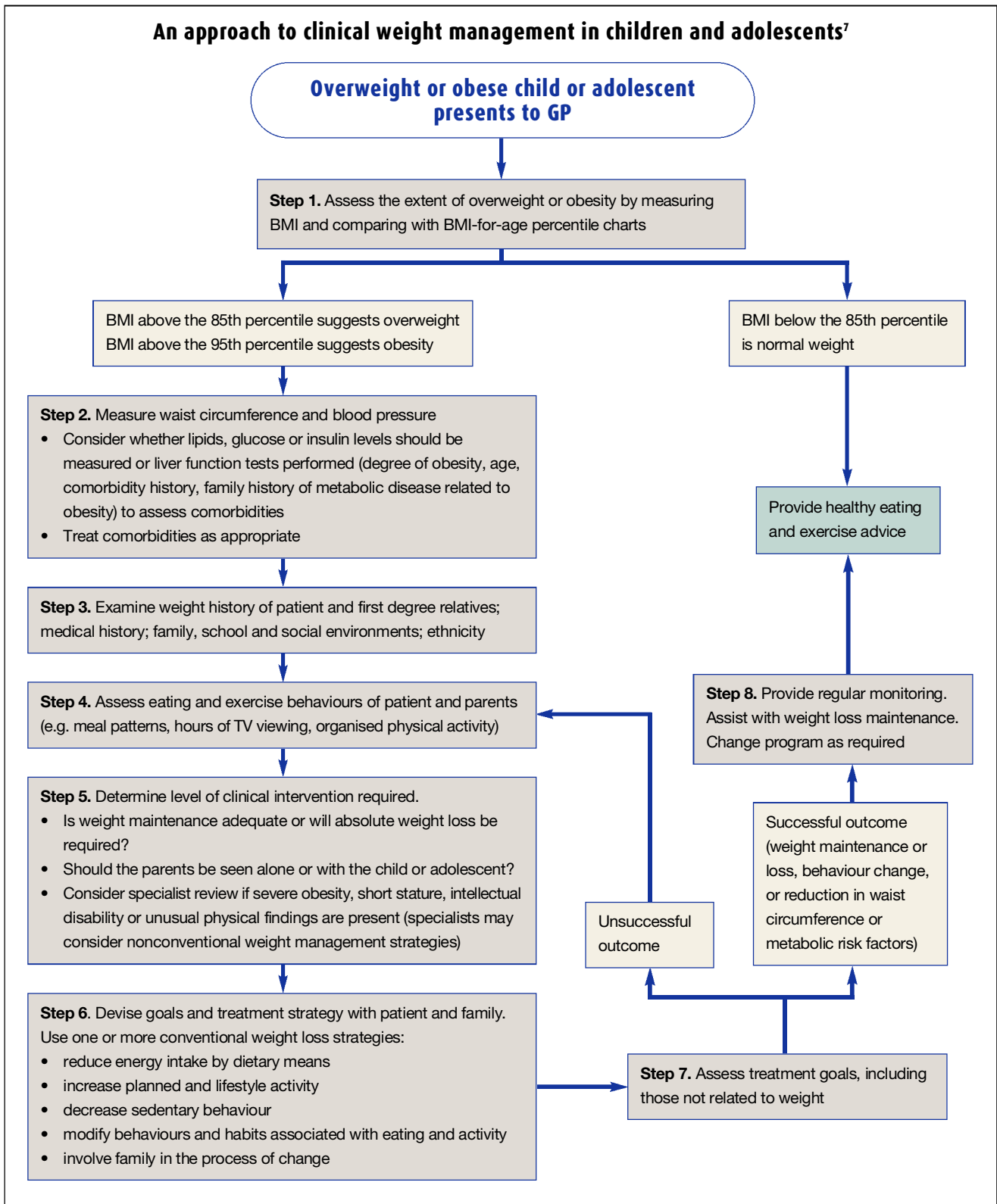
### Medical management of obesity

Obesity in children and adolescents is challenging to treat. A systematic review of the literature has shown that there are a limited number of randomised controlled trials, mostly conducted in

Figure. Increasing physical activity is important in weight management, and must be maintained in the long term.

**Table 1. Complications associated with obesity in childhood and adolescence**

System	Health problems
Psychosocial	Social isolation and discrimination, bullying, decreased self-esteem, body image disorder, bulimia Poorer social and economic 'success' and increased risk of bulimia and depression in adulthood
Respiratory	Obstructive sleep apnoea, asthma
Orthopaedic	Back pain, slipped femoral capital epiphyses, tibia vara, ankle sprains, flat feet
Gastrointestinal	Nonalcoholic fatty liver disease, gastro-oesophageal reflux and gastric emptying disturbances, gallstones
Genitourinary	Polycystic ovary disease, menstrual irregularities
Cardiovascular	Hypertension, adverse lipid profile (low HDL cholesterol, high triglycerides, high LDL cholesterol) Increased risk of hypertension, adverse lipid profile and coronary artery disease in adulthood
Endocrine and 'metabolic'	Hyperinsulinaemia, insulin resistance, glucose intolerance, impaired fasting glucose, type 2 diabetes Increased risk of type 2 diabetes mellitus and obesity in adulthood
Neurological	Pseudotumour cerebri
Skin	Acanthosis nigricans, striae, intertrigo



the USA, with small sample sizes and high attrition rates.<sup>8</sup> Strategies used to treat obesity in children and adolescents are based on behaviour modification using a developmentally appropriate approach with family support, and include long term dietary change, increased physical activity and decreased sedentary behaviour (Table 2).

### Clinical assessment

All obese children and adolescents should initially have a full history and physical examination performed. Detailed information should be sought on lifestyle, as well as the impact of obesity on the life of the young person and his or her family. A family history of obesity and disorders associated with insulin resistance (such as type 2 diabetes, hypertension, dyslipidaemia, premature heart disease and obstructive sleep apnoea) should be obtained. Of particular importance, there should be a detailed exploration of the factors influencing physical activity, sedentary behaviour and dietary intake. This history will help determine why and how energy imbalance has occurred.

Height and weight should be measured and body mass index (BMI) calculated and then plotted on a BMI-for-age chart (BMI = weight in [kilograms]/height [in metres]<sup>3</sup>).<sup>9</sup> The Centers for Disease Control BMI-for-age percentile charts are recommended for clinical use ([www.cdc.gov/growthcharts](http://www.cdc.gov/growthcharts)). Overweight is suggested by a BMI above the 85th percentile, and obesity by a BMI above the 95th percentile (no definitions exist for children under 2 years of age). Waist circumference can be used as a proxy for abdominal obesity and, even in childhood and adolescence, is strongly correlated with markers for comorbidities such as adverse lipid and glucose profiles and hypertension. No specific cut-off points for waist-circumference-for-age exist for categorising abdominal obesity in children and adolescents. BMI and waist circumference may be most useful

in the clinical assessment of individual patients, when serial measurements are used to monitor change over time.

Complications associated with obesity that should be sought on physical examination are outlined in Table 1. They include hypertension (use an appropriately sized cuff), acanthosis nigricans (which can be indicative of insulin resistance), striae, intertrigo, hepatomegaly (fatty liver) and an abnormal gait due to joint problems. Warning signs that may indicate causes such as hypothyroidism, hypercortisolism or Prader–Willi syndrome include short stature, developmental delay or the presence of dysmorphic features. Note that it is generally very easy to distinguish exogenous obesity associated with a familial predisposition and a high risk lifestyle from other, rare, causes of obesity. A history suggestive of sleep apnoea should be sought (for example, snoring, daytime somnolence, witnessed apnoeas and lack of refreshment after sleep), but this complication can be difficult to diagnose accurately on questioning.

The following approach to biochemical screening in obese patients is recommended in the abovementioned NHMRC guide for GPs:<sup>7</sup>

- fasting lipid profile – consider in obese adolescents and children, especially those with a family history of cardiovascular disease
- fasting insulin and glucose – consider in obese adolescents and children, especially those with a family history of type 2 diabetes, those with acanthosis nigricans or those from certain high risk ethnic backgrounds (that is, from the Indian subcontinent or Mediterranean and Middle Eastern regions, or Aboriginal and Torres Strait Islanders, Maoris and Pacific Islanders)
- liver function tests – consider in patients with greater degrees of obesity, followed by a hepatic ultrasound if transaminases are elevated

### Table 2. Behavioural management of obesity in childhood and adolescence

- Clarification of treatment outcomes
- Family involvement
- Developmentally appropriate approach
  - preadolescent children: focus on parents
  - adolescents: separate sessions for the young person
- Long term dietary change
  - reduce energy intake
  - choose lower fat foods
  - reduce intake of high sugar foods and drinks
  - avoid severe dietary restriction
- Increase in physical activity
  - increase incidental activity
  - choose active transport options (e.g. walking, cycling)
  - participate in more physical lifestyle activities
  - participate in more organised activities
- Decrease in sedentary behaviour
  - decrease use of television, computer and other electronic entertainment
  - use alternatives to motorised transport

- other endocrinology tests are not recommended unless there is other evidence of endocrine disease or short stature.

### Defining treatment outcomes

When treating an overweight or obese child or adolescent the goals of therapy should be clarified at the outset (Table 3). Markers of a successful outcome of therapy may include improvements in morbidity (for example, sleep apnoea, hypertension, insulin resistance, dyslipidaemia), psychosocial functioning, healthy lifestyle behaviours, aerobic

continued

capacity and family functioning.

Depending on the stage of the child's development, a decrease in the rate of weight gain or weight stabilisation over time, as opposed to weight loss, may be a suitable goal. This is dependent on each individual case, as children who are severely obese will be able to lose weight safely. For adolescents who have finished their pubertal growth spurt, weight loss is recommended. A decrease in waist circumference ('waist loss') is a measure of improvement in abdominal obesity.

**Focus of therapy**

Weight management therapy should be family-based and developmentally appropriate for the patient. Involving the parents is necessary with both preadolescents and adolescents.

Each family and adolescent requires

thorough education regarding the nature of obesity management, along with help in understanding that 'quick fix' options such as extreme diets or strict exercise programs are not effective. Emphasise that the key to long term weight management is a reduced energy intake coupled with increased amounts of both structured and incidental physical activity.

It is suggested that the family focus on making small, sustainable changes in behaviour. Offering large amounts of information can be overwhelming and can make it difficult for them to concentrate on any one area of change. Examples of small changes that can be suggested include limiting the number of hours of television the child or adolescent watches each day and only purchasing low fat dairy products for the household.

**Preadolescence versus adolescence**

There is good evidence to show that obesity management in preadolescent children is more effective when only parents are involved in therapeutic sessions.<sup>10</sup> Parents are usually in a powerful position to effect change. In most cases they are the adults who purchase the food for the household, are able to facilitate an environment that is conducive to change, can support children by acknowledging and encouraging positive behaviours, and are generally the primary role models for all health-related behaviours. For situations in which grandparents or other family members are the child's primary caregivers, they, in addition to the parents, need to be targeted.

A slightly different approach is needed for managing adolescent obesity. There is little evidence available to show the most effective management strategy for overweight and obese adolescents. The few controlled studies available on the management of adolescent obesity suggest that it may be most effectively managed when the patient and his or her parents have the opportunity to attend some therapy sessions separately.

**Strategies**

**Dietary change**

It is important that the whole family adopts any changes to food-related behaviours. Targeting only the obese child or adolescent within a family can draw unnecessary attention to the individual's weight problem. It may also place an impossible burden on a young individual who has no control over the wider family food and physical activity environment.

Some of the 'high risk' food-related behaviours associated with excess weight gain in children and adolescents can be identified by the family doctor during routine consultations (Table 4). Some recommendations that can be made to families to promote more positive food related behaviour are listed in the upper box on page 53.

It should be noted that rigorous 'dieting' has been identified as a trigger factor for the development of an eating disorder in some predisposed individuals. For this reason, strict dietary restriction should not be used with a paediatric population. Moderate caloric restriction, coupled with increased energy

**Table 3. Defining weight management outcomes**

**Improvement in complications or behaviour**

- Resolution of medical complications (e.g. sleep apnoea, hypertension, insulin resistance, glucose intolerance, dyslipidaemia)
- Improvement in self-esteem and psychosocial functioning
- Increase in healthy lifestyle behaviours (e.g. related to eating, physical activity)
- Increase in level of fitness or aerobic capacity
- Improvement in family functioning

**Improvement in measures of body fatness**

- Slowing in rate of weight gain, weight maintenance or weight loss, depending on developmental stage and degree of obesity
- Decrease in waist circumference

**Table 4. High risk eating behaviours**

- Unstructured meal and mid-meal times
- Skipping breakfast
- Excessive consumption of fruit juice, cordial or soft drink
- 'Grazing' (i.e. frequent snacking) during the after-school period
- Consumption of high fat, high glycaemic index snack foods (e.g. processed muesli bars, biscuits, potato chips and cakes)
- Large portion sizes
- Frequent consumption of takeaway foods
- Presence of high fat food in the household (e.g. chocolate and chips)

expenditure, is the standard weight management protocol.

### Increasing physical activity

Making changes to a family's physical activity habits can be just as important as making dietary changes. The pervasiveness of computers, videos, DVDs, pay television and hand-held computer equipment is no doubt related to the recent dramatic increases in sedentary behaviour and hence the increasing rates of child and adolescent obesity.

Individuals usually require a mix of structured activity (such as swimming lessons, soccer, netball or tennis) and unstructured or incidental activity (such as household chores, walking to the shops or school and unstructured play) for weight control. Parents may overestimate the amount of time their children spend engaged in structured and incidental activities and underestimate the amount of time they spend in sedentary activities such as playing the computer and watching television.

Obese children may find group-based activities intimidating because their skills and performance levels may be below that of their leaner peers. Additionally, some may be embarrassed by the prospect of wearing sports clothes or swimsuits in public. In these cases, families can be encouraged to incorporate more activity into their everyday lifestyles. For all children and adolescents, incidental activity can be readily increased by choosing active transport options (such as walking, cycling and using public transport) over the routine use of the family car for local trips. Some ideas for increasing physical activity are shown in the lower box on this page.

### Decreasing sedentary behaviour

As previously mentioned, reducing the amount of sedentary behaviour a child or adolescent is engaged in can be just as important as increasing structured and incidental activities. Ideally, less than two

## Strategies for encouraging positive food-related behaviour

- Advise parents that children over the age of 2 years can consume reduced fat dairy products (see [www.nhmrc.gov.au/publications/synopses/dietsyn.htm](http://www.nhmrc.gov.au/publications/synopses/dietsyn.htm)).
- Encourage parents to read food labels and purchase only healthy food choices that contain less than 10 g of fat per 100 g of food.
- Encourage children, adolescents and their families to eat breakfast every day. Some quick and easy breakfast options include liquid meal breakfast drinks (found in the cereal aisle in the supermarket), Milo made with low fat milk, fruit and yoghurt.
- Encourage water as the main drink. Low fat milk is a nutritious beverage option, although not more than 600 mL of milk should be consumed each day. Allow fruit juice, cordial and soft drinks on special occasions only.
- Encourage the choice of low glycaemic index cereal foods where possible. Examples include grainy bread, wholegrain breakfast cereal, stone and temperate fruit, low fat dairy foods and pasta. For more information on the glycaemic index see <http://www.glycemicindex.com/>
- Promote set meal and mid-meal times to stop 'grazing' eating patterns that can often lead to overeating.
- Encourage the eating of food at the table only, not in front of the television or while standing in the kitchen.
- Recommend that takeaway foods are consumed, at most, once per week.

## Ideas for increasing planned and incidental physical activity

- Walk to and from school or at least park the car further away from the school.
- Plan a regular, active family outing once a week, such as a bushwalk, trip to the beach, bike ride or roller blading session.
- Park the car further away from the shops when running errands.
- Involve the children in 'fun' family chores such as washing the car or mowing the lawn.
- Set up a basketball hoop in the garden.
- Supply inexpensive activity-promoting equipment such as balls, skipping ropes or frisbees.
- Promote the use of stairs and escalators, rather than lifts.
- Identify possible friends for children to play with.
- Locate parks and cycleways in the local neighbourhood where children can play safely.
- Set a good example by engaging in regular activity such as taking walks after dinner or shooting basketball hoops on the weekend.
- Encourage walking within the family: purchase a pedometer so individuals can count how many steps they take (it is recommended that adults take 10,000 steps per day and children, 7500 steps).
- Involve children in the daily household activities by encouraging them to have regular active jobs such as walking the dog, vacuuming the house, washing the car and sweeping up leaves.



### Strategies for reducing television and computer use

- Ask children and adolescents to plan in advance the television programs they would like to watch.
- Remove televisions from children's bedrooms.
- Have specific television and non-television times in the household.
- Specifically target the afternoon period for a decrease in sedentary behaviour (e.g. tape afternoon television programs to watch in the evening).
- Turn off the television when meals are served.
- Store remote controls in a drawer.

hours a day should be spent in passive electronic entertainment such as television, video games and computer games. Some strategies to help families reduce the amount of television and computer games watched and played each day are shown in the box on this page.

### Referral and follow up

There is a severe shortage of services for the management of child and adolescent obesity in the community, and family doctors are often the only primary service providers available to families with obese children. Where services are available, GPs may refer families or young people to paediatric dietitians, physiotherapists, exercise scientists or consultant psychologists. Such health professionals may link with family doctors to develop resource materials on management strategies that can be given to patients. For GPs working

in remote areas, tertiary hospitals may have resource materials available for parents and adolescents on their websites.

Many overweight and obese children or adolescents can be managed in general practice. However, those patients with very severe obesity, significant metabolic complications of obesity or growth failure or other signs of endocrine or genetic disease will need referral to a paediatrician or specialist clinic for specific management. It is important to be aware that some obese children and adolescents and their families will present with significant psychosocial disturbance. These cases warrant referral to a specialist child and adolescent psychiatric service.

Regular follow up with a health professional is helpful in supporting families and young people making long term lifestyle changes. There is little evidence to guide decisions regarding the frequency

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of follow up, and the time between follow up appointments is up to the individual practitioner and patient. Families who are already motivated may need only one or two initial appointments to receive information and put it into practice; in these cases, follow up every six months may be a reasonable goal. For families who find making changes more difficult, several frequent visits in the initial period may be required to raise motivation and discuss progress.

### **Nonconventional weight management strategies**

Behavioural weight management is the preferred treatment for most obese children and adolescents. Very-low-calorie diets, drug therapy and bariatric surgery are not currently recommended for these age groups because there is insufficient evidence from randomised controlled

trials for the safety and efficacy of these treatments for paediatric obesity. Such therapies should only be considered when behaviour management has failed, there are significant obesity-associated complications and the child is thought to have reached full adult height. If non-conventional therapies are used, they should be done in the context of a behavioural weight management program, in a tertiary centre under the supervision of a specialist.<sup>6</sup>

### **Conclusion**

Child and adolescent obesity is a significant and rapidly escalating problem in Australia. Family doctors are in a key position to assess and manage obesity in this age group, as outlined in the NHMRC clinical practice guidelines.<sup>6,7</sup> Obesity associated complications should be sought on history and physical exami-

nation, and may require specific therapy. BMI should be plotted on a BMI-for-age chart, and waist circumference recorded. Long term behavioural change is the cornerstone of effective management. This involves clarification of treatment outcomes, a family-focused and developmentally sensitive approach, dietary change to a sustainable lower energy intake, a decrease in sedentary behaviours and an increase in physical activity (especially incidental activity). Severe obesity may require the use of less conventional therapies. Other health professionals, where available, may be useful in helping patients and their families achieve significant lifestyle change. MT

*A list of references is available on request to the editorial office.*

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**DECLARATION OF INTEREST:** None.



# Managing obesity in childhood and adolescence

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