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# Adolescent overweight and obesity

## How best to manage in the general practice setting

### BACKGROUND

The prevalence of overweight and obesity continues to increase in adolescents. Community level management is necessary as specialist services are limited.

### OBJECTIVE

This article outlines a management plan for the overweight adolescent in general practice, using a chronic care approach and follows the National Health and Medical Research Council *Clinical practice guidelines for the management of overweight and obesity in children and adolescents*.

### DISCUSSION

Overweight and obesity will not resolve spontaneously at puberty, and active intervention is required both to improve current health and wellbeing and to reduce the risks of premature morbidity and mortality in adult life. Modest, cumulative changes to lifestyle together with modest weight loss goals to reduce the risk of weight rebound are important. Any intervention has to take account of the rapid cognitive and behavioural changes of adolescence.

**The prevalence of overweight and obesity among children and adolescents in Australia is around 25%, making overweight one of the most common chronic disorders of adolescence.<sup>1</sup> Therefore, one in 4 adolescents seen in general practice is likely to be overweight. Adolescence is one of the critical life periods for the development of obesity.<sup>2</sup> In females in particular, gonadal hormone change results in an increase in percentage body fat and this increase can be exaggerated in those teens who enter puberty already overweight. In males, increasing testosterone levels drive a change to both greater percentage lean mass and lower body fat, but will not overcome obesity if lifestyle factors are adverse. Obese adolescents have a greater than 80% risk of becoming obese adults.<sup>3</sup> The belief that overweight will remit spontaneously at puberty is unfounded. Current and longer term physical and psychosocial morbidity in adolescents make effective management of overweight and obesity during adolescence a high priority.<sup>1</sup>**

### Presentation

Presentation can be a direct request for help with losing weight, but more likely it will be because of a morbidity secondary to overweight or a health issue unrelated to overweight. There are limited public health management services for overweight adolescents and hospital based clinics tend to see only the more severe degrees of overweight. Commercial weight loss programs are limited by cost or by the 'nonadolescent friendly' atmosphere. Adolescents rate easy access, a 'one stop' service, staff friendliness and confidentiality as necessary components of a health service,<sup>4</sup> placing general practitioners in an excellent position to help patients with weight loss. Comorbidities related to overweight will present in adolescence (*Table 1*) and it is important to view weight loss as an integral part of therapy. Chronic illness and disability, which affect at least one in 10 adolescents, can be associated with overweight as a result of therapy or the effect of illness on lifestyle.

## Raising the issue of overweight without losing your patient

The young person is no doubt aware of their situation and may be relieved to talk about it in a nonjudgmental atmosphere. Motivational interviewing techniques form the basis of the approach, although evidence in obesity management is limited.<sup>5</sup> These techniques are based on the premise that behaviour is altered by motivation rather than by information. In weight management, engagement might be along the following lines when raising the subject:

- use feeling well and being fit as engagement language
- make the conversation relevant to what is concerning the patient (eg. improving the chances of playing in team sport, clearing the skin, feeling more in control and less tired)
- make time to obtain an adequate assessment of their personal situation – adolescents are generally very happy to talk about themselves and valuable management insights will be gained
- avoid the desire to use the argument about future health issues – parents are likely to be worried about these but not the adolescent.

The approach of engaging the adolescent around what is important for them and setting goals that are theirs is vital in management and retention in management. There is no evidence that a healthy weight management approach in adolescents will induce an eating disorder. Many overweight adolescents (females and males) have disordered eating patterns<sup>6</sup> including bingeing, meal skipping and continuous evening grazing (which results in absent morning hunger and breakfast skipping).

## Assessment

### History

A full weight history cannot be obtained in one standard consultation and as the management goal is to keep seeing the young person, the history can be extended over time. Important knowledge to be gained from the first interview is around lifestyle, so that at the end of the interview some management interventions can be put in place. The first intervention could include keeping a food and activity diary and many adolescents will at least do this, particularly if a creative computer diary is suggested.

Select history items from the following: small screen hours (television, video, computer; sedentary behaviours), soft drink and fruit juice intake, reduced meal frequency (particularly breakfast skipping), reduced sleeping hours, and low levels of moderate to

**Table 1. Complications of overweight in adolescents**

### Medical

#### Endocrine

- early pubertal onset in females
- polycystic ovaries
- type 2 diabetes (and acanthosis nigricans) in high risk populations

#### Orthopaedic

- genu valgus, pes planus and excessive pronation
- slipped capital epiphysis
- tibia vara (Blounts disease)

#### Gastrointestinal

- hepatic steatosis
- gastro-oesophageal reflux
- cholelithiasis (may be exacerbated by very low energy diets)

#### Cardiovascular

- hypertension
- adverse lipid profile
- endothelial dysfunction

#### Respiratory

- sleep disordered breathing including obstructive sleep apnoea
- asthma (higher prevalence rates in overweight)
- right heart failure in extremes of overweight

#### Neurological

- benign intracranial hypertension

#### Other

- excess sweating, heat rash and intertrigo
- breathlessness and tiredness
- cutaneous striae
- musculoskeletal pain and discomfort
- pseudogynaecomastia in males

### Psychosocial

- depression
- poor self worth
- teasing and bullying
- disordered eating

vigorous physical activity which are all associated with overweight.<sup>7-11</sup> Takeaway food use and choice, source of school lunch, second helpings, and portion size compared to other family members will help address the total kilocalorie intake, which will need reduction. A family history (overweight, type 2 diabetes, dyslipidaemia, early heart disease and hypertension) will guide the intensity of investigation and it is likely that this information will already be available.

If the presence of depression or other psychosocial distress is suspected then these issues should be addressed first. Weight management requires significant psychological energy and the presence of depression

will sabotage a weight management program. As rapport and trust are established, more history can be obtained around sensitive issues such as family support, disordered eating and bullying.

### Physical examination

The 'eyeball' test will not identify all cases of overweight. Because body mass index (BMI) increases with chronological age, the calculated absolute BMI needs to be converted to a percentile for those aged 18 years or less. If the BMI is in the adult overweight/obese range then the adolescent is clearly overweight/obese. Following National Health and Medical Research Council (NHMRC) guidelines >85<sup>th</sup> BMI percentile is overweight and >95<sup>th</sup> BMI percentile is obese (see *Resource*).<sup>12</sup> A waist measure is useful to monitor progress. Adolescents, especially overweight adolescents, are very sensitive about their body and should not be expected to undress for the initial physical examination. When dealing with adolescents it pays to perfect the technique of physical examination by moving clothing around. Measure blood pressure using a wide cuff if necessary, assess mobility and flexibility as they move in the office, check for acanthosis nigricans on neck and in axillae, inspect oropharynx for small size, large tonsils and crowding as these increase the risk of sleep apnoea, look for acne and facial hirsutism in females, and inspect bare feet standing (excess pronation may require podiatry review to see if orthotics might improve walking and exercise comfort). Pubertal status can be assessed by

self report using Tanner line drawings on growth charts and is important for making decisions about weight loss goals.

### Investigations

Generally, the greater the overweight or the stronger the family history, the lower the threshold for laboratory investigation. The reason for investigation is to identify metabolic risk factors, therefore fasting glucose, lipid profile and liver function tests should be requested. A fasting insulin is commonly raised in overweight but has limited predictive value. Metabolic markers improve with successful weight management and are a powerful motivating tool. If polycystic ovaries are suspected, testosterone, sex hormone binding globulin (SHBG) and free androgen index should be measured. Thyroid function is usually assessed because of patient/parent anxiety about underactive thyroid and abnormal metabolism, but the prevalence of abnormality will be no greater than in normal weight adolescents. If resting metabolic rate were to be measured by indirect calorimetry it would be high, not low, as it is directly proportional to body weight.

### How to feel confident about excluding secondary causes of overweight and obesity

If the adolescent is of normal intelligence, has no dysmorphic features and has normal height growth then a secondary cause for overweight is unlikely. Endocrine disorders associated with overweight, including Cushing syndrome, impair height growth. Overnutrition in healthy children and adolescents promotes height growth as well as weight gain. Most genetic syndromes of obesity, such as Prader Willi and Bardet Biedl, have early onset obesity and other associated physical and behavioural abnormalities. If such features are present, referral to a paediatrician or genetic service is indicated, as well as isolated extreme early onset obesity. A defect in the central melanocortin 4 receptor is the most common single obesity gene abnormality that has been identified to date.<sup>13</sup> At present there is no therapy available but the potential for targeted therapy is there.

### Treatment

The evidence base for treatment of overweight in adolescents is limited. In the past 20 years there have been only 12 published randomised controlled trials of obesity management among adolescents, of which three were pharmacological studies.<sup>12,14,15</sup> Almost all were performed in a tertiary care setting with intensive intervention resources, with small numbers and limited

**Table 2. Ten practical tips to help the adolescent get started with weight management**

1. Eat breakfast every day
2. Take lunch from home rather than buying from the school canteen
3. Drink water or low fat milk and avoid sugary soft drinks and fruit juice
4. Choose take away food carefully – go for lower fat options such as sandwiches and grilled meats. Avoid hot chips and other fried foods and anything with lots of cheese
5. Go for two fruit and five vegetable serves per day. Experiment with vegetables to find ones that are acceptable
6. Reduce small screen use by 25% – the adolescent to decide how they will do this
7. Walk part of the way to school and back and plan two walks on the weekend
8. Ask the adolescent what physical activity they might enjoy and negotiate with the family around this
9. Encourage activity with friends rather than internet contact
10. Encourage parents to reduce nagging about weight – they need to provide a good weight loss environment and model healthy behaviours, but the adolescent makes the choices

long term follow up. In clinical practice, the NHMRC guidelines suggest using a combination of the standard behavioural interventions: dietary modification, reduction in sedentary behaviours and an increase in physical activity and behaviour modification<sup>12</sup> (Table 2). In practice this involves a reduction in total intake, which should be performed gradually so that hunger does not become extreme. Low fat and low glycaemic index carbohydrates should be chosen, only water and low fat milk used for drinks and labels for pre-packaged food read carefully. The *Australian guide to healthy eating* gives a clear outline of age related requirements.<sup>16</sup> A referral to a dietician for formal assessment and advice is recommended so that general practice dietary management strategies can be strengthened and reinforced.

Small screen use needs to be reduced. The recommendation is 2 hours or less, but start with a 25% reduction initially. Lifestyle activity such as walking to and from school or the shops, helping with household activities and outdoor leisure, must be increased. The Australian Government *Physical activity recommendations for children and young people* are that:

- young people should participate in at least 60 minutes (and up to several hours) of moderate to vigorous intensity physical activity every day, and
- young people should not spend more than 2 hours per day using electronic media for entertainment, particularly during daylight hours.<sup>17</sup>

Once confidence with being physically active is achieved, more formal physical activities can be added. Adolescents will generally not exercise by themselves and any activity that is fun and involves peers is more likely to be maintained. Overweight adolescents are extremely self conscious about their body and should not be forced into activities such as swimming or gym classes where they may feel exposed and vulnerable. Exercise without dietary modification will generally not be successful. A review by an exercise physiologist is invaluable in determining exercise capacity and type. In primary school children, parents are the primary agents of environmental change for weight management. With adolescents, parents need to be involved and supportive but with the evolving independence of the adolescent acknowledged in any treatment plan. The adolescent should have time with the health professional by themselves and confidentiality should be addressed at the first visit.

### The role of more intensive therapies

Very low energy diets involve partial and or full meal replacement. While rapid weight loss occurs there

#### Case study 1

An adolescent female, 16 years of age, is brought to see you by her mother because of 9 months amenorrhoea. Her periods were initially regular after menarche but then became lighter and further apart. In the past year she has had acne and some increase in facial hair. You notice some acanthosis nigricans on her neck and in her axillae. She has a BMI of 30 (between the 95<sup>th</sup> and 97<sup>th</sup> percentile for age and gender) and has experienced significant (20 kg) weight gain with puberty. Her mother had gestational diabetes and two grandparents have type 2 diabetes.

Practice point: polycystic ovaries can present in adolescence. An oral glucose tolerance test (OGTT) with glucose and insulin and fasting lipids would be indicated given her long term risks of early cardiovascular disease and type 2 diabetes. If insulin levels are high, metformin may be the treatment of choice to improve insulin sensitivity, reduce ovarian insulin stimulated androgen production and induce her menstrual cycle. Be careful when using the oral contraceptive pill (OCP) as a menstrual regulator as it may increase body weight in susceptible females. Spironolactone may help hirsutism if physical means are inadequate.

#### Case study 2

An adolescent male, 17 years of age, comes to see you because of a sore throat and you diagnose a viral infection. You notice enlarged tonsils, a short thick neck and a very small oropharynx. He has a BMI of 28 (between the 90<sup>th</sup> and 95<sup>th</sup> percentile) and a waist circumference of 112 cm. You notice that he has gained 10 kg since giving up football with a knee injury 18 months ago and that much of this weight gain is abdominal.

Practice point: sporting injuries are more common in the overweight, so exercise programs need to be low impact. It would be a good time to explore exercise options as the goal is to maintain activity habits into adulthood. He should be asked about symptoms of obstructive sleep apnoea, as it may adversely affect school performance as well as increasing medical morbidity. His abdominal adiposity places him at risk for an adverse metabolic profile. The challenge is to raise the issue of weight in a context where it is not the presenting concern.

is no evidence that there is a sustained weight or health benefit.<sup>18</sup> Full use could be justified in the older adolescent who has completed height growth where rapid weight loss is required medically or surgically. Partial use (eg. two meal replacements) in the older adolescent is useful to demonstrate that weight loss is possible if calories are restricted.

None of the three currently available anti-obesity agents are on the Pharmaceutical Benefits Scheme (PBS) and none has been shown to be effective independent of lifestyle change. Prescriber information for sibutramine states that it is 'contraindicated in children <18 years of age due to insufficient data'. Short term use could be considered in the older adolescent where hunger

is a major issue.<sup>19</sup> Like sibutramine, there are limited data for orlistat, which is recommended to be used with precaution. Most adolescents will not take it when they have a fatty meal.<sup>20</sup> Phentermine has a potential for abuse and should not be used in adolescents. There is limited data on bariatric surgery in adolescents,<sup>21</sup> with a randomised controlled trial on lap banding currently in progress in Victoria. Surgery could be considered in the older adolescent with significant medical comorbidity and who is able to provide informed co-consent with a parent or guardian. This approach, as with other intensive therapies, should be undertaken in consultation with specialist weight management services with experience in adolescent health.

### Realistic goal setting

Sensational media stories about weight loss create unrealistic expectations for both adolescents and their families. Weight maintenance is the first treatment goal. If there is significant height growth potential, weight maintenance is all that might be required to achieve a healthy weight. The growth spurt is a late pubertal event for males but an early one for females. An overweight 13 year old postmenarchal female has completed most of her height growth and will need to lose weight to achieve a healthy body weight. An overweight 13 year old male will generally not have his growth spurt until 14–15 years of age and height growth plus weight maintenance might be all that is needed to achieve a healthy weight. A consistent weight loss of 1–2 kg/month is an excellent weight loss result in the adolescent.

### Continuing engagement

To date, the only cure for overweight is bariatric surgery. Lifestyle change remains the key management component. However, most weight loss studies show that short term weight loss is rarely maintained as a result of physiological drives and the difficulty of maintaining healthy eating and activity habits (relapse). Adult studies have shown that sustained weight loss and relapse management are best achieved by an initial more intensive intervention over months followed by extended but less frequent management visits over years;<sup>22</sup> a pattern well suited to general practice.

The importance of viewing overweight as a chronic condition, a condition with high risk of relapse, and which requires long term therapeutic intervention is essential for successful long term management. With adolescents, it is useful to spell this out upfront and negotiate a personal management program which takes their schedules and commitments into account.

If adolescents do not show up for an appointment, take the time to find out why and rebook. Ask them if an 'SMS' the day before would be a useful reminder. Avoid sounding like a parent.

### Summary of important points

- One in 4 adolescents is overweight.
- Puberty will not result in spontaneous weight loss and an overweight adolescent will become an overweight adult without intervention.
- Overweight adolescents may already have psychosocial and medical morbidity.
- Lifestyle change is the basis of weight management and will involve reduction in dietary intake and sedentary activities, an increase in physical activity and long term behavioural change.
- Set realistic behaviour change goals and weight loss goals.
- Involve the family but be aware of the growing independence of the adolescent.
- Plan for a long term intervention.
- More intensive therapies for more severe degrees of overweight may require specialist consultation.

### Resource

BMI calculators and curves are available from the Royal Childrens' Hospital, Melbourne: [www.rch.org.au/genmed/clinical.cfm?doc\\_id=2603](http://www.rch.org.au/genmed/clinical.cfm?doc_id=2603).

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