



**Care pathway for  
the management of  
overweight and obesity**



# Care pathway for the management of overweight and obesity

**DH INFORMATION READER BOX**

<b>Policy</b> HR/Workforce Management Planning Clinical	Estates Performance IM & T Finance Partnership Working
<b>Document purpose</b>	Best Practice Guidance
<b>Gateway ref:</b>	6236
<b>Title</b>	Care pathway for the management of overweight and obesity
<b>Author</b>	Sheela Reddy
<b>Publication date</b>	May 2006
<b>Target audience</b>	PCT CEs, Directors of PH, GPs
<b>Circulation list</b>	
<b>Description</b>	<p>The comprehensive package comprises materials for health professionals as well as information to be given to patients. It includes Obesity Care Pathways for adults and children and a supporting booklet with detailed information for health professionals. In addition, tools to help GPs raise the rather sensitive issue of weight opportunistically with both adults and children.</p> <p>The package will include a weight loss guide in the form of a booklet to be given to overweight or obese patients who agree/intend to lose weight. The guide aims to clarify the myths around losing weight and preventing weight gain and provide simple self-help advice with pointers on appropriate diet and physical activity. In order to motivate those overweight or obese patients who are reluctant to take action, a leaflet on the importance of losing weight and small steps that can be taken is also included.</p>
<b>Cross ref</b>	Consultation on the Obesity Care Pathway which closed on 3 January.
<b>Superseded docs</b>	N/A
<b>Action required</b>	N/A
<b>Timing</b>	N/A
<b>Contact details</b>	Dr Sheela Reddy Obesity/National Programme Delivery Room 705, Wellington House 133-155 Waterloo Road London SE1 8UG 020 7972 1365
<b>For recipient use</b>	

# Contents

<b>Introduction</b>	<b>2</b>
<b>Adults</b>	<b>3</b>
<b>Children and young people (under 20 years)</b>	<b>13</b>
<b>References</b>	<b>21</b>
<b>Appendix A: Adult Care Pathway (Primary Care)</b>	<b>22</b>
<b>Appendix B: Children and Young People Care Pathway (Primary Care)</b>	<b>23</b>
<b>Appendix C: 'Raising the issue of weight' tool for adults</b>	<b>24</b>
<b>Appendix D: 'Raising the issue of weight' tool for children and young people</b>	<b>26</b>
<b>Appendix E: Centile BMI charts for children</b>	<b>28</b>

# Introduction

This booklet offers evidence-based guidance to help primary care clinicians identify and treat children, young people and adults who are overweight or obese. It supports the care pathway that the Department of Health made a commitment to developing in the White Paper *Choosing Health: Making Healthy Choices Easier*. You will find the care pathway – one version for adults and another for children and young people – at Appendices A and B.

Although the resources have a general practice focus, they may also be useful for other practitioners in primary care and be used opportunistically to advise patients they may see for reasons other than obesity. School nurses may also play a key role in the treatment of children and young people.

Overweight and obesity should be treated like any other medical condition, and patients should have access to appropriate treatment and care. A sensitive, empathic, non-judgemental approach should underpin all obesity-related intervention. The advice provided within this pathway is intended to complement the National Institute for Health and Clinical Excellence (NICE) guidelines, which are due for release later this year and is likely to be updated accordingly. Although the pathway focuses on treatment, the importance and value of prevention should not be underestimated. This pathway, while based on the best available evidence, recognises the need for further research in the primary care setting.

The pathways in Appendices A and B are available as laminated posters. In addition to this booklet, the following tools will help practitioners to understand and implement the pathways:

- *Raising the Issue of Weight*, a laminated card for health professionals, with tips on how to initiate the discussion with patients.
- *Why Weight Matters*, a card for patients who are not yet committed to losing weight. This card will discuss risks associated with overweight, the benefits of modest weight loss, and practical tips for people to consider.
- *Your Weight, Your Health*, a booklet for patients who are ready to think about losing weight.

The Faculty of Public Health/National Heart Forum toolkit gives further guidance on the development of obesity services and is available at [www.fphm.org.uk](http://www.fphm.org.uk) Clinicians should also refer to the local guidelines. Training strategies will cover obesity, so that knowledge and skills will develop over time.

The Department of Health produced this pathway after reviewing the evidence base and holding a time-limited consultation with more than 70 organisations.

# Adults

## Assessment

Practitioners need to handle assessment carefully, as many overweight or obese patients are very sensitive about their weight.

## Obesity and overweight measurements

You can measure overweight or obesity by recording a patient's Body Mass Index (BMI). To calculate a patient's BMI, divide their weight in kilograms by the square of their height in metres. All patients should have their BMI recorded, because there is strong evidence for a link between the increasing prevalence of co-morbidities and increasing BMI.<sup>1</sup> Showing a patient a BMI chart can help them understand their weight status and may be a more sensitive way of raising the issue.

You should consider patients for intervention within the pathway if their BMI is 30 or more, or if it is 28 or more with co-morbidities.<sup>2</sup> Any offer of support to the overweight group depends on the level of local resources.

The table below outlines adult BMI classification and the related risk of co-morbidities.

**Table 1: Classification of Body Mass Index\***

Classification	BMI	Risk of co-morbidities
Underweight	<18.5	Low (but increased risk of other clinical problems)
Desirable weight	18.5–24.9	Average
Overweight	25.0–29.9	Mildly increased
Obese	>30.0	
– Class I	30.0–34.9	Moderate
– Class II	35.0–39.9	High
– Class III (severely or morbidly obese)	>40.0	Very high

\*Slightly modified version of that used by the International Obesity Task Force

Increasing weight carries a higher risk for Asian populations, who are known to suffer greater morbidity from being overweight or obese.<sup>3</sup> The cut-off BMI level for observed risk in overweight varies from 22 to 25 in different Asian populations. For high risk it varies from 26 to 31.

People who are physically very active have greater proportions of lean tissue. Depending on the level of activity, BMI can be a less accurate predictor of risk. Other people for whom BMI may not be an accurate reflection of weight status include those who are older, very short or very tall.

The best way to assess obesity and associated health risks is to use a combination of BMI, waist circumference and body shape.<sup>4</sup> Measure the patient's waist circumference according to the World Health Organization (WHO) guidelines, which recommend using the midpoint between the lowest rib and the top of the right iliac crest.<sup>4</sup>

Waist circumference levels greater than 102cm (40 inches) in men and 88cm (35 inches) in women are associated with increased visceral fat mass and co-morbidities, including metabolic syndrome.<sup>5</sup> In the Asian population there is increased risk at  $\geq 90$ cm in men and  $\geq 80$ cm in women.<sup>6</sup> However, measurement of waist circumference in patients with a BMI of more than 35 will generally be less helpful.

Local protocols and resources will govern the frequency of BMI and waist monitoring.

Once you have measured the patient's BMI and waist circumference, you can proceed with the assessment. The following information is provided as a guide and specific information will vary from individual to individual.

## **History taking**

### ***(a) Medical history***

Bear in mind the risks that can be associated with overweight and obesity, including:

- diabetes;
- gallstones;
- hypothyroidism;
- hypertension;
- hyperlipidaemia;
- coronary heart disease (CHD);
- metabolic syndrome;

- polycystic ovary syndrome;
- sleep apnoea;
- osteoarthritis and associated mobility problems;
- non-alcoholic steato-hepatitis (NASH);
- learning disabilities; and
- mental health problems.

### ***(b) Family history***

Is there any history of diabetes or CHD in the family? Get environmental information, and find out which family members may be supportive or obstructive in weight control.

### ***(c) Social history***

Ask about alcohol consumption and smoking.

### ***(d) Drug history***

Is the patient on any medication that might cause weight gain, eg anti-psychotics, steroids or sulphonylureas?

### ***(e) Dietary history***

### ***(f) Physical activity history***

First-line tests include blood pressure, fasting blood glucose, lipid profile and thyroid function.

For further information see Appendix C, the 'Raising the issue of weight' tool for adults.

### **Readiness to change**

There is evidence that overweight people are more motivated to lose weight if advised to do so by a health professional.<sup>7,8</sup> An excellent starting point is a collaborative discussion between clinician and patient to:

- explore how the person feels about their weight;
- help them understand that there are successful solutions; and
- increase their awareness of the risks associated with carrying excess weight.

Often, you will intuitively glean information about someone's readiness to change. However, you may need to consider whether making changes to lose weight is right for this person at this time of their life.<sup>9,10</sup> Changing personal circumstances may have an impact, so a patient's ability to make changes is not necessarily constant over time. The following questions can help you assess readiness:

- How important is losing weight at the moment?
- What would have to change in your life for you to be able to tackle your weight?
- Are you concerned about your weight?
- Do you believe that you could lose weight?
- How important is it for you to lose weight at the moment?
- You have gained weight since the last time we met. Is this something we could talk about?
- Is your weight affecting your life in any way at the moment?
- Do you know that it could really help your blood pressure if you managed to lose a little weight?

If a patient does not appear to be ready to change, give them the *Why Weight Matters* card. Try to explore reasons why they may not be ready, and what might be done to influence this. Where possible, offer the patient the chance to come back at some future point. Some individuals may be – or appear to be – uncertain about readiness to change. In this case, limited discussion about management options may be helpful.

For further support, see Appendix C, the 'Raising the issue of weight' tool.

There may be circumstances where a health professional should recommend weight management to an overweight or obese patient with established disease even if they lack motivation. This should be at the GP's discretion.

## **Weight management**

The priority in weight management should be to reduce risk factors for the patient, rather than to return them to an 'ideal' or healthy weight range. Very small degrees of weight loss produce health benefits, but significant changes result after a loss of 5–10%.<sup>11,12,13</sup> For some individuals, a weight loss of as little as 7–12lb (3.0–5.5kg) can achieve health benefits. You can support approaches undertaken within the practice by referring the patient to local initiatives and to peer and community support programmes.

Aim to prevent further weight gain in patients with lower degrees of overweight, ie those with a BMI of 27 or more but less than 30, who have no associated morbidity and do not come from a high-risk ethnic group.

Patients in higher weight categories should aim to lose 5–10% of their body weight over three to six months, and to maintain their new weight in the long term. An energy deficit of approximately 500–600kcal per day should help them achieve this. The *Your Weight, Your Health* booklet shows individuals how to make changes that will create an energy deficit of this magnitude.

### **First-line management**

The aim of first-line management is to help a patient to:

- reduce calorie intake;
- increase physical activity while reducing sedentary behaviours; and
- increase self-awareness about day-to-day behaviours that affect intake and activity levels.

Self-monitoring using a diary may help patients to track their activity, their food intake and their feelings about their weight.

Diet and increased physical activity are both known to reduce weight, independently of each other.<sup>14,15,16,17</sup> However, diet alone is more effective than exercise alone for weight loss, while exercise is important for subsequent weight maintenance.

The range of services available locally will influence who delivers weight management intervention. It will be useful to give the patient some guidance on how long the intervention might last, and the likelihood of follow-up appointments at the surgery. All of this will depend on local resources and protocols, but it may be useful to discuss a target of a 5–10% weight loss over three to six months. This will mean losing 0.5 to 1.0kg per week.

### **Healthy eating**

Any diet that reduces calorie intake can lead to weight loss, but it is important to promote a diet that is:

- in line with general healthy eating recommendations;
- acceptable to the patient; and
- sustainable in the long term.

Ideally, dietary recommendations should be extended to the patient's household, particularly where more than one member is obese. The following guidance is based on the Balance of Good Health.

- Eat five or more portions of a range of fruit/vegetables per day.
- Base meals on starchy foods such as wholemeal bread, pasta, rice, cereal, potatoes or other root vegetables.
- Reduce intake of foods high in fat and sugar.
- Use cooking methods that reduce fat, eg grilling and steaming, and limit the addition of fat in cooking.
- Reduce alcohol intake, as alcohol is high in calories.
- Consume fewer snacks high in fat or sugar – snack on fruit and vegetables instead.

The patient information booklet *Your Weight, Your Health* is a useful reference for patients to take home. It will enable them to build on information they receive in the practice. Some individuals may choose to attend commercial organisations for additional advice and support. This should complement the practice approach.

Low-calorie diets (1,000–1,500kcal/day) are proven effective methods of weight loss.<sup>14,15</sup> Very low calorie diets (VLCDs) should only be used under medical supervision and ideally with input from a registered dietitian.<sup>17</sup> Fad diets or highly restrictive diets such as low-carbohydrate, high-protein diets should be avoided; they are likely to be unsustainable and their long-term impact on health remains unclear.

### **Physical activity**

Evidence supports making the following recommendations to your patient.

- Introduce goals for lifestyle change that reduce sedentary behaviours. This should begin to improve energy balance. The increase in activity will help to create a calorie deficit. The level of deficit will vary according to the specific activity.
- Increase exercise as part of daily living. Activities such as walking to work and taking the stairs can be as beneficial as gym-based exercise, and are more likely to be sustained over the long term.
- Make the next goal 30 minutes of moderately intensive activity, such as brisk walking, on at least five days a week.<sup>18</sup> This will be a substantial challenge for many very obese individuals and the effort required cannot be overestimated. Work collaboratively with the patient to plan realistic and achievable goals that will gradually increase activity levels.

- If the patient has met the daily target of 30 minutes, raising it to at least 60 minutes a day is recommended for weight loss and maintenance.<sup>18</sup> Individual goals should be set to ensure that targets are practical and appropriate.
- Physical activity is effective even when broken down into 10-minute chunks.<sup>18</sup> Patients may find a pedometer useful for monitoring their activity levels. The recommendation for health is 10,000 steps a day.

Again, the *Your Weight, Your Health* booklet is a useful reference for patients. This links with Sport England's Everyday Sport campaign which aims to encourage people to build more activity into their day-to-day lives.

### Behaviour change

Ideally, front-line health professionals – in both the public and private sector – should combine their advice on diet and physical activity with behavioural strategies to help patients to:<sup>19</sup>

- recognise how feelings can influence behaviours relating to weight and health;
- plan for action, by setting a start date and deciding what measures to take;
- set goals, identifying specific and manageable changes such as replacing a biscuit snack with fruit, getting off the bus two stops early, and using a pedometer to monitor increases in activity;
- visualise what life will be like when a particular goal is achieved;
- regularly monitor and record weight, diet and activity levels;
- avoid stimuli to overeating, such as walking past the fish and chip shop, keeping crisps in the cupboard and failing to plan meals and snacks;
- reward their own achievements with non-food rewards – eg buying a new CD;
- seek support from family and friends;
- use self-help materials on behaviour change.

### Drug therapy

Encourage patients to attempt diet, physical activity and behaviour change before prescribing drugs.<sup>20, 21</sup> Always consider drug therapy as an addition, rather than an alternative, to lifestyle intervention. Both orlistat and sibutramine are licensed for use in England for the treatment of obesity in adults. Health professionals should adhere to NICE guidance when prescribing these drugs.<sup>22, 23</sup> Primary care trusts may also have local guidelines.

### ***Orlistat***

Orlistat inhibits the action of pancreatic lipase enzymes in the gastrointestinal system and needs to be used in conjunction with a low-fat eating plan. Failure to implement a low-fat diet may result in gastrointestinal side effects such as flatulence, diarrhoea or faecal incontinence, and oily stools.

You should only prescribe for patients who:

- are aged between 18 and 75; and
- have a BMI of 30 or more without co-morbidities, or 28 or more with co-morbidities.

If you prescribe orlistat, you should strongly advise the patient to register with the Motivation, Advice, Proactive Support (MAP) programme. This provides free telephone and web support, as well as patient education materials, newsletters and pedometers. The MAP contact number is **0800 731 7138**. Online support is at [www.xenicalmap.co.uk](http://www.xenicalmap.co.uk)

### ***Sibutramine***

Sibutramine is a satiety enhancer. It works on the central nervous system by altering the chemical messages that control how a person feels and thinks about food. Sibutramine needs to be used in conjunction with healthy eating.

You should only prescribe sibutramine for patients who:

- are aged between 18 and 65;
- have a BMI of 30 or more without co-morbidities, or 27 or more with co-morbidities;
- have controlled blood pressure (145/95 or below); and
- have no history of coronary artery disease, arrhythmias, congestive heart failure or stroke.

If you do prescribe sibutramine, here are some important guidelines:

- Check the patient's blood pressure every two weeks for the first three months.
- After 12 weeks on sibutramine, patients should only continue taking the drug if they have lost at least 5% of their body weight since the start of the treatment.
- Patients should show a 2kg weight loss after four weeks on sibutramine. If they do not, you can increase the dosage from 10mg a day to 15mg a day.

- If a patient loses weight but then regains 3kg or more, discontinue treatment.
- The sibutramine licence recommends that treatment should not continue beyond 12 months.
- Patients who are prescribed sibutramine are eligible for the 'Change for Life' programme. This is a free step-by-step dietary and lifestyle pack. Healthcare professionals can obtain copies of the pack from Abbott Laboratories, tel: **01628 644392**.
- Advise the patient strongly to register with the online support programme for patients receiving sibutramine, at: **[www.changeforlifeonline.com](http://www.changeforlifeonline.com)**

### Specialist referral

If a patient does not respond to first-line management, or if their case is particularly complicated, consider referring them to specialists such as dietitians, psychologists, physiotherapists and/or specialist weight management clinics (depending on availability).

### Surgery

Surgery is generally considered for obesity only after all other interventions have been exhausted. There may be local policies and procedures governing bariatric surgery, and availability will vary to some degree.

Bariatric surgery forces a restriction in capacity by reducing gastric size. This may also cause some malabsorption of ingested food. Surgery is considered for patients with a BMI above 40, or above 35 with co-morbidities, in whom diet, lifestyle and medical methods of weight loss, applied in accordance with the relevant NICE guidelines, have not succeeded.<sup>24, 25</sup>

Surgery is only appropriate for patients who:

- are assessed as suitable by a multidisciplinary team;
- are well informed;
- are motivated; and
- have an acceptable level of surgical risk.

Patients will still need to make lifestyle changes – particularly in diet – after surgery, and they should have access to relevant support.

## **Maintenance of weight loss**

People who have lost weight find that maintaining their new, healthier weight is a major challenge, and they are prone to relapse. It is better to lose a small amount of weight and keep it off than to set an unrealistic target and lose no weight. All patients should be encouraged to set goals to help them adhere to changes implemented in the weight loss phase.<sup>26, 27</sup> For many, maintaining their weight requires a lifetime of support and increased effort.

Ongoing monitoring of weight should be a key element of any maintenance programme. This may or may not be possible within the practice, depending on local resources. Currently, there is some evidence – though limited – on the positive effects of self-help peer groups with therapist-led booster sessions and/or regular weight charting. It may also be useful to consider the role of additional sources of support that patients can access, such as leisure services, peer and community support and responsible independent sector organisations.

# Children and young people (under 20 years)

## Parental awareness

Many obese children are not aware that their weight is too high. Nor, frequently, are their parents.<sup>28</sup> A further complication is the fact that most overweight or obese children have overweight or obese parents, because obesity can be genetic and is also related to a shared environment. It is important to consider all these factors when raising the issue of weight.

The level of a child's involvement in discussions about weight should be at the GP's discretion and should also take into account the maturity of the child. It is important not to make parents or child feel that they are to blame. However, they do need to understand that they have a part to play in preventing further weight gain.

Sensitive discussion of the issue is essential if the parents are to accept any advice. 'You know your child should lose weight' is not a helpful starting point. A better approach is to encourage participation and frank discussion, eg by asking: 'How do you feel about your child's weight?'

## Assessment

Health professionals need to assess and manage childhood overweight or obesity in a sensitive, empathic and non-judgemental manner – particularly as the children and their families sometimes feel embarrassed or defensive.

You can measure overweight and obesity in children by BMI, provided the values are related to reference standards for age and sex – you cannot use adult charts. There are separate centile charts for BMI and height. To calculate a child's BMI, divide their weight in kilograms by the square of their height in metres, as usual. You should plot the child's weight and height regularly, and record their BMI.

The 91st and 98th centiles are widely used cut-offs for the definition of overweight and obesity in clinical practice respectively. Considering a child's degree of overweight together with the family's readiness to change (see page 15) will help you decide the level of priority for intervention.

When you want to inform a parent of their child's overweight or obese status, show them – in a non-judgemental way – where their child's BMI falls on the BMI centile chart. You will need to explain the normal range of BMI for the child's age. For most children, the goal is to maintain their weight while their height increases. However, children with BMI over the 98th centile for their age, who have complications due to obesity or who are over seven years of age, should aim for gradual weight loss.

Once you have established that the child is overweight or obese by measuring BMI, you should consider:

- the pattern of weight change;
- past and current physical activity;
- patterns of eating and drinking, particularly sugary drinks such as squashes and carbonated drinks;
- psychological and/or emotional factors that can lead to or result from obesity, such as low self-esteem, bullying, depression, bereavement, sexual abuse, unhealthy relationships and poor academic progress;
- medical causes of obesity, which, though rare, can include endocrine disorders and congenital syndromes (see box below);

#### **Rare causes of obesity:**

- **endocrine problems (usually signalled by short stature or faltering growth), including:**
  - **hypothyroidism;**
  - **Cushing's syndrome;**
  - **growth hormone deficiency, which can delay puberty;**
- **chromosomal disorders such as Prader-Willi syndrome;**
- **acanthosis nigricans – a velvety pigmented rash on neck and axilla and sometimes knuckles, which is a sign of insulin resistance.**

- physical co-morbidities such as:
  - hypertension (use an appropriate child-sized cuff and check centile charts for blood pressure, as cut-offs will vary with age);
  - diabetes (impaired glucose tolerance and diabetes can only be ruled out using an oral glucose tolerance test);
  - pseudotumour cerebri (benign intracranial hypertension);
  - polycystic ovary syndrome;
  - sleep apnoea (and obesity hypoventilation syndrome);
  - hip and knee problems;
  - back and joint problems;
  - dyslipidaemia;
  - steatosis;
  - depression.

For clinicians in primary care, a urine dipstick for glucose and protein would typically be a sufficient initial screening test for physical co-morbidities.

You should also consider other family members' health status and relationship to the child, to find out:

- genetic information, such as a family history of type 2 diabetes; and
- environmental information, such as who within the family may be supportive or obstructive in weight control.

Refer to the 'Raising the issue of weight' tool for children and young people (Appendix D).

### **Readiness to change**

Health professionals should not generally recommend intervention unless the child and their family are ready to change. If they are not, the intervention is likely to be ineffective. It may even be harmful, as unsuccessful programmes may diminish the child's self-esteem and impair future efforts to improve weight.

You will often be able to glean information about readiness to change intuitively. However, you may need to explore the child's and family's expectations, and judge whether weight management is right for this child and family at this time. Some families will be ready to make lifestyle changes. Others may still be considering whether these changes are necessary or not. It is important to ensure that parents do not feel blamed, as this will affect their engagement. Asking the following questions can help you assess readiness quickly:

- Has the child expressed any concerns about their weight or shape?
- Has the child been teased about their weight or shape?
- Do any family members have concerns about the child's weight?
- How important is weight management at the moment?
- Which elements of their lives would need to change in order to tackle the problem?

Where a child and/or their family are not ready to change, explore the reasons why, and what measures might influence this attitude. For example, you could discuss:

- the health risks of overweight and obesity;
- associated symptoms such as sweating and exercise intolerance;
- counselling;
- assertiveness training; and
- self-esteem training.

Ensure that children and families not ready to change are given every opportunity to come back, or be referred, when they are ready.

## **Management**

The main goal in managing overweight and obese children is to achieve a sustainable improvement in diet and activity levels, rather than an ideal weight. A change in the child's BMI centile towards the normal weight range will indicate success. This may involve some weight loss in very obese children. However, weight maintenance, or weight gain at a slower rate than normal for age, will also improve a child's BMI. The goal for most children is not to lose weight, but to maintain their weight or reduce their rate of weight gain while their height increases. Therefore, once you have plotted the child's BMI, you should also plot their height on the centile growth chart to ensure that they maintain normal growth.

Weight loss is recommended for all children with weight-related complications. They may warrant interventions regardless of their BMI.

## **First-line management**

The evidence suggests that reducing energy intake by dietary change, while increasing energy expenditure by reducing sedentary behaviour and increasing physical activity, is effective in the long-term treatment of childhood obesity.<sup>29, 30</sup> Any advice you give should therefore focus on adopting a healthy lifestyle. The effectiveness of advice alone is debatable, so it is always better to take a problem-solving, negotiated approach.

Depending on local availability, you may be able to refer the child and their family to various exercise, slimming, parenting and/or peer support schemes. You can also discuss any initiatives that are in place in local schools.

The following are the cornerstones of successful management:

- Begin as soon as parents and families are willing to make appropriate lifestyle changes.
- Strongly encourage parents to be role models for the whole family, not only for the overweight child.
- Use a therapeutic style centred on family and caregivers.
- Coordinate efforts with the school where appropriate.
- Encourage and empathise, don't criticise.
- Aim for small, gradual but long-term, sustainable changes to intake and activity levels.
- Ensure that parents of children under 12 take responsibility for what their child is eating.
- Encourage children over 12 to self-monitor eating and activity.
- Promote non-food rewards for positive behaviour.
- Implement frequent follow-up, ongoing support from a variety of sources, and monitoring.

**Note:** There is no evidence that promoting sensible weight management, through better diet and increased physical activity, increases the risk of a child developing anorexia.

### **Physical activity**

Identify opportunities for increasing activity and discuss barriers to this. Consider the following:

- Every day, all children should aim to be active for at least one hour.
- Small changes will have health benefits. A starting point is to assess the child's current physical activity level and, where possible, reduce sedentary behaviours such as watching television and using the computer.
- Does the child live in a neighbourhood where it is safe to go out and play? How many hours a week are allocated to physical activity at school? Are there any sports facilities for children near the home? Does the child need to be driven there?
- Find new ways for the child to become more active, as well as reducing sedentary behaviours. The aim should be to work up gradually to at least 60 minutes of at least moderate intensity physical activity – continuous or broken down – each day.

- Children and young people are unlikely to adhere to timetables of periodic physical activity such as using a treadmill.
- Try to increase family-based activities such as swimming, going to the park or playground, ball games, walking, playing Frisbee and cycling.
- Try to introduce new hobbies that may develop skills requiring increased physical activity. Examples are skating, roller-blading, basketball, dancing and martial arts.
- Try to introduce families to activity groups, leisure centres and local initiatives. It may be helpful to develop a local directory to give to families.

### Healthy eating

It is critical to encourage a diet that is in line with general healthy eating recommendations and is sustainable for the whole family. The best way to restrict a child's energy intake is to make small dietary changes, based on the Balance of Good Health, and raise activity levels. Calorie counting is not recommended for children in primary care, and over-restriction of energy intake can slow down growth.

The *Your Weight, Your Health* booklet describes in detail how to achieve a healthy diet, but the basic advice is as follows:

- Aim for five or more servings of a variety of fruit and vegetables a day. Offer fruit and vegetables at snack times as well as at meals.
- Reduce intake of foods that are high in fat; ready-made meals; and food and drinks that are high in sugar, such as confectionery, sugary squashes and carbonated drinks.
- The child should eat meals with the family, rather than eating alone or eating different foods.
- Meals should include starchy foods such as wholemeal bread, pasta, rice, cereal, potatoes or other root vegetables.
- An adequate fluid intake is important but should be limited to water or semi-skimmed milk. The child can drink diluted pure fruit juice, but only at mealtimes.
- Occasional treats are acceptable.
- Parents should strive to lead by example.
- Parents should avoid using food to reward or comfort themselves or their children.

**Note:** The approach you negotiate should be flexible and based on the support that the family needs in order to change. Involving families in calorie counting is not the solution.

There are a few cases where a calorie-controlled plan may be appropriate for a child – particularly where the child is severely obese, or is over 15 years of age. (National Diet and Nutrition Survey data reveal that energy intake at age 15 is similar to adult intake.) In such cases, the calorie deficit calculations should be done by a paediatric dietitian to ensure that energy and nutrient intake is adequate for normal growth.

### Behaviour change

Discuss with parents how they might identify and modify unhelpful behaviours in themselves, the child, the rest of the family and caregivers. The most thoroughly evaluated treatment for childhood obesity is family-based intervention that gives diet and physical activity advice, combined with behavioural strategies, on a whole-family basis.

Clinicians who are not specialists in behaviour change may be able to help by using some of the following techniques:

- Ask the parents to identify specific behavioural goals, eg:
  - replace biscuit snacks with fruit;
  - get off the bus two stops early;rather than general statements of intent, eg:
  - eat more fruit;
  - be more active.
- Involve the child, depending on their age.
- Encourage self-monitoring of eating and activity within the family unit to increase adherence. Parents should help children to use a diary to record eating, and a pedometer to record exercise.
- Suggest reducing the cues that trigger unwanted behaviour, eg don't walk past the fish and chip shop, don't have crisps in the cupboard.
- Encourage other family members and friends to adopt a healthier lifestyle too, and/or to join a support group.
- Provide small non-food rewards to children who comply.
- Bringing peer pressure into play will help influence children to make changes.

**Note:** All children will need some psychological support in order to change behaviours. Children suffering from depression or eating disorders will need ongoing specialist psychological support.

### Parenting support

Most parents will benefit from advice about parenting. This will enable them to help their children change behaviours and improve self-esteem.

### **Referral to an appropriate specialist**

Consider referral to a paediatrician or a paediatric endocrinologist for assessment of underlying causes and/or co-morbidities for children with:

- serious obesity-related morbidity, such as diabetes, sleep apnoea, orthopaedic problems, and hypertension;
- weight above the 98th centile but height below the 50th centile;
- weight above the 98th centile and a mother or father with type 2 diabetes (this should prompt an oral glucose tolerance test);
- precocious or late puberty;
- significant learning disability;
- severe and progressive obesity before age two;
- symptoms or signs of a genetic/endocrine abnormality.

Referral to local dietitians should be driven by local protocols as there will be variation.

### **Pharmacological and surgical treatment**

For any child or young adult, you should only consider pharmacological or surgical intervention as second-line management. In the first instance, always refer them for specialist medical treatment. Check whether local protocols also exist.

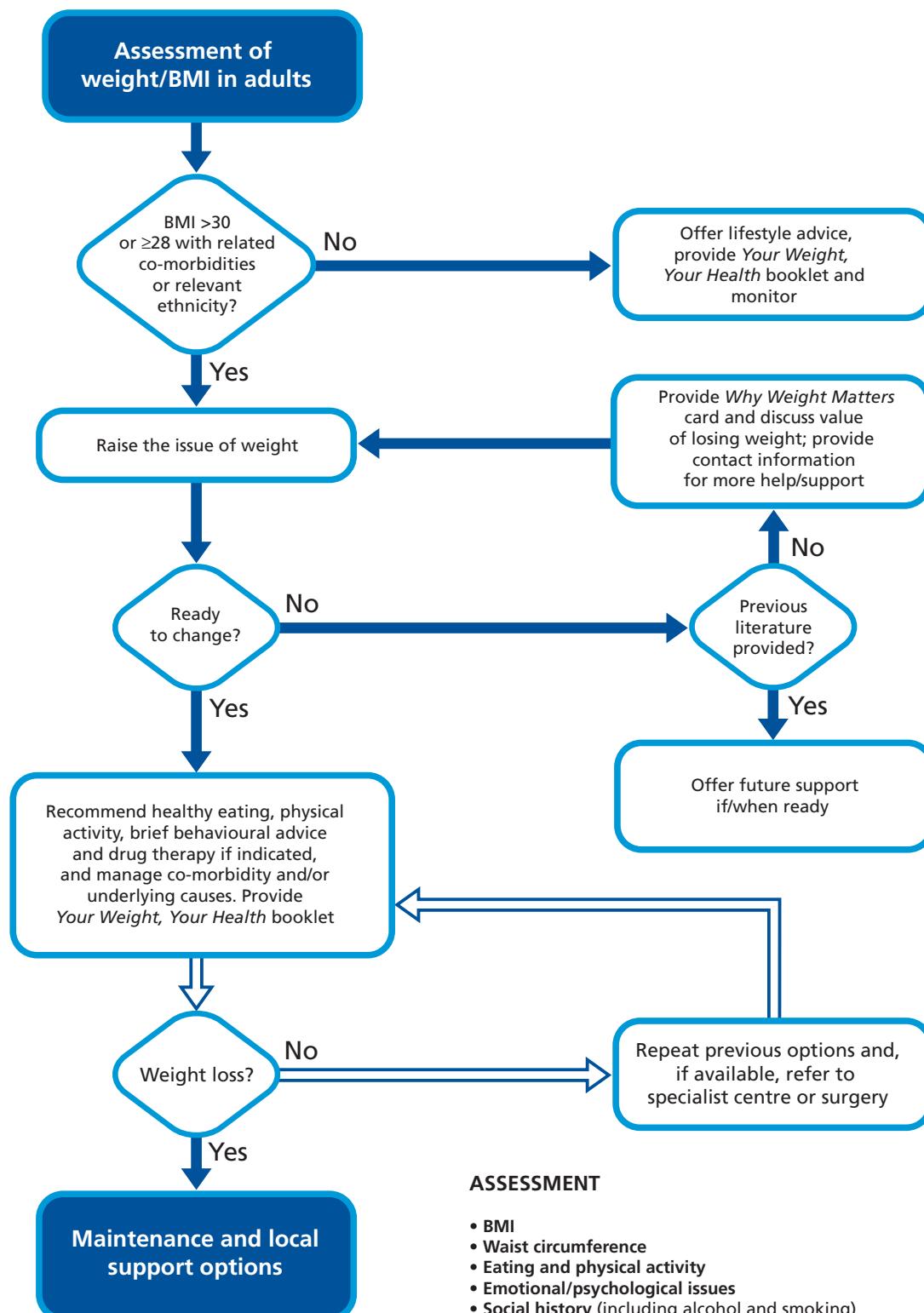
### **Maintenance**

Once you have helped the child and their family to establish a pattern of healthy living, the aim is to help them avoid returning to their previous unhealthy lifestyle. The family are likely to require some monitoring and ongoing support. Give them details of local services that can help with maintenance. Parents also have an important role in ensuring ongoing self-monitoring within the family.

# References

1. Must A, Spadano J, Coakley E, Field A, Colditz G and Dietz W (1999) The disease burden associated with obesity. *JAMA* 282: 1523–9.
2. Calle EE, Thun MJ, Petrelli JM, Rodriguez C and Heath CW (1999) Body-mass index and mortality in a prospective cohort of US adults. *NEJM* 341(15): 1097–105.
3. WHO Expert Consultation (2004) Appropriate body mass index for Asian populations and its implications for policy and intervention strategies. *Lancet* 363: 157–63.
4. Lean M, Han T, Morrison C (1995) Waist circumference as a measure for indicating need for weight management. *BMJ* 311: 158–61.
5. Eckel RH, Grundy SM and Zimmet PZ (2005) The metabolic syndrome. *Lancet* 365: 1415–28.
6. International Diabetes Federation (2005) 'The IDF consensus worldwide definition of the metabolic syndrome'. [www.idf.org](http://www.idf.org).
7. Galuska DA, Will JC, Serdula MK and Ford ES (1999) Are health care professionals advising obese patients to lose weight? *JAMA* 282: 1576–8.
8. Levy BT and Williamson PS (1998) Patient perceptions and weight loss of obese adults. *J Fam Pract* 27: 285–90.
9. Marcus BH and Simkin LR (1994) The transtheoretical model: Applications to exercise behavior. *Med Sci Sports Exerc* 26:1400–4.
10. Prochaska JO, DiClemente CC, Norcross JC (1992) In search of how people change: Applications to addictive behaviours. *Am Psychol* 47: 1102–14.
11. Van Gaal LF, Waunters MA and De Leeus IH (1997) The beneficial effects of modest weight loss on cardiovascular risk factors. *Int J Obes Relat Metab Disord* 21: 55–9.
12. Goldstein, DJ (1992) Beneficial health effects of modest weight loss. *Int J Obes Relat Metab Disord* 6: 397–415.
13. Diabetes Prevention Programme Research Group (2002) Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *NEJM* 346: 393–403.
14. Frost G, Masters K, King C, Kelly M, Hasan U, Heavens P et al (1991) A new method of energy prescription to improve weight loss. *JHumNutr Dietetics* 4: 369–73.
15. Prentice A and Jones P (2004) Obesity in Britain. Gluttony or sloth? *BMJ* 311: 437–9.
16. Wing RR (1999) Physical activity in the treatment of the adulthood overweight and obesity: current evidence and research issues. *Med Sci Sports Exerc* 31 (11 Suppl): S547–52.
17. Avenell A, Broom J, Brown TJ, Poobalan A, Aucott L, Stearns S, Smith WCS, Jung R, Campbell MK, Malek M and Grant AM (2004) Systematic review of the long term effects and economic consequences of treatments for obesity and implications for health improvement. *Health Technology Assessment NHS R&D HTD Programme* 8(21).
18. Department of Health (2004) At Least Five a Week: Evidence on the impact of physical activity and its relationship to health. CMO Gateway Reference: 2389.
19. Steptoe A and Doherty S (1999) Behavioural counselling in general practice for the promotion of healthy behaviour among adults at increased risk of coronary heart disease: randomised trial. *BMJ* 319: 943–8.
20. O'Meara S, Riemsma R, Shirran L, Mather L, ter Riet G (2001) A rapid and systematic review of the clinical effectiveness and cost effectiveness of Orlistat in the management of obesity. *Health Tech Assess* 5(18).
21. O'Meara S, Riemsma R, Shirran L, Mather L, ter Riet G (2002) The clinical effectiveness and cost effectiveness of Sibutramine in the management of obesity: A technology assessment. *Health Tech Assess* 6(6).
22. NICE (2001) Orlistat for the treatment of obesity in adults. Guidance No. 22. Available at [www.nice.org.uk](http://www.nice.org.uk).
23. NICE (2001) Guidance on the use of Sibutramine for the treatment of obesity in adults. Guidance No. 31. Available at [www.nice.org.uk](http://www.nice.org.uk).
24. Clegg AJ, Colquitt J, Sidhu MK, Royle P, Loveman E and Walker A (2002) The clinical effectiveness and cost-effectiveness of surgery for people with morbid obesity: A systematic review and economic evaluation. *Health Tech Assess* 6(12).
25. NICE (2002) Guidance on the use of surgery to aid weight reduction for people with morbid obesity. Technology appraisal guidance No. 46.
26. Wing RR, Hill JO (2001) Successful weight loss maintenance. *Annu Rev Nutr* 21: 323–41.
27. Westerp-Plantenga MS, Kempen K and Saris WH (1998) Determinants of weight maintenance after diet-induced weight reduction. *Int J Obes Relat Metab Disord* 22(1): 1–6.
28. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC and Binns HJ (2006) Parents' perceptions of their child's weight and health. *Paediatrics* 117: 681–90.
29. Campbell K, Waters E, O'Meara S and Summerbell C (2003) Interventions for treating obesity in children. *Cochrane Review*. Cochrane Library, Oxford.
30. NHS Centre for Reviews and Dissemination (2002) The prevention and treatment of childhood obesity 1–12. York, University of York. Effective Health Care.

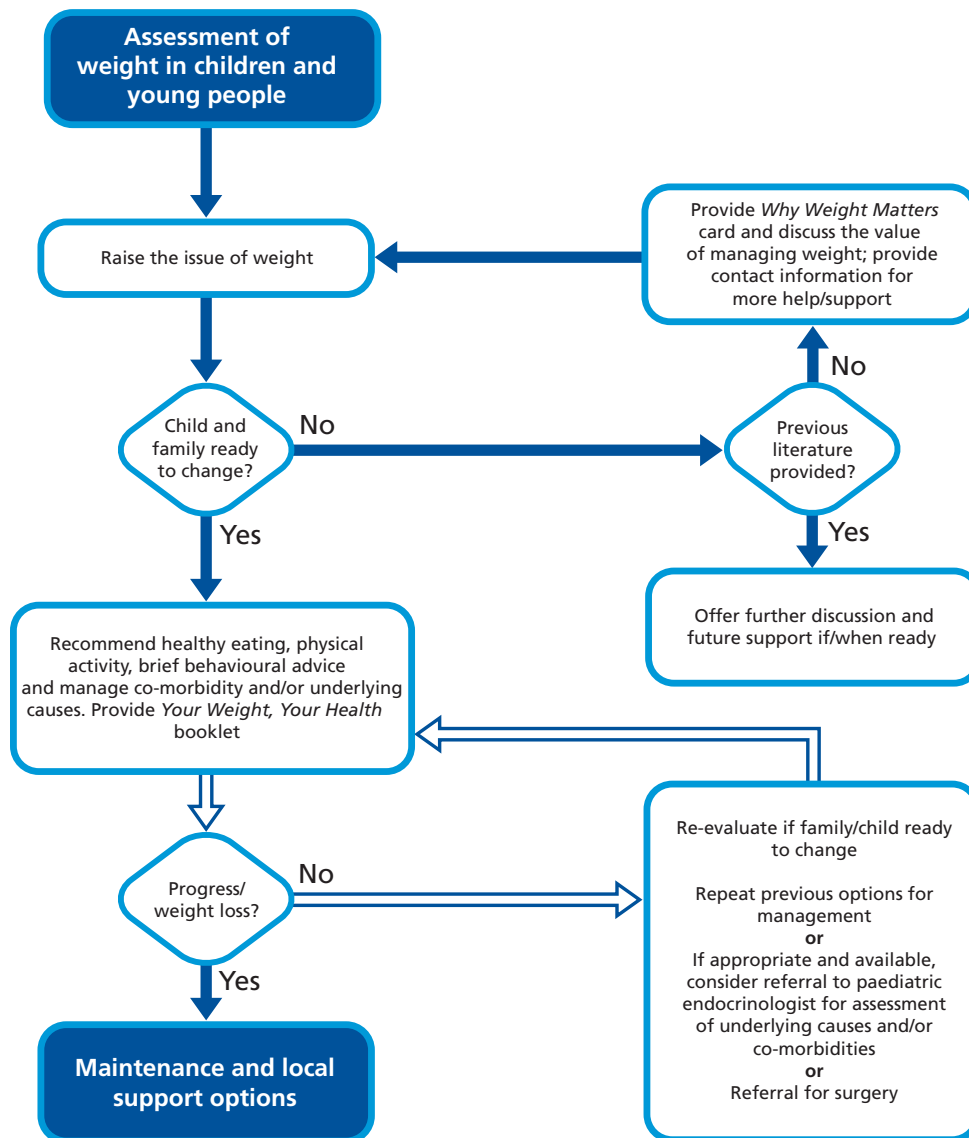
# Appendix A: Adult Care Pathway (Primary Care)



## ASSESSMENT

- BMI
- Waist circumference
- Eating and physical activity
- Emotional/psychological issues
- Social history (including alcohol and smoking)
- Family history  
eg diabetes, coronary heart disease (CHD)
- Underlying cause  
eg hypothyroidism, Cushing's syndrome
- Associated co-morbidity  
eg diabetes, CHD, sleep apnoea, osteoarthritis, gallstones, benign intracranial hypertension, polycystic ovary syndrome, non-alcoholic steato-hepatitis

# Appendix B: Children and Young People Care Pathway (Primary Care)



## ASSESSMENT

- Eating habits, physical patterns, TV viewing, dieting history
- BMI – plot on centile chart
- Emotional/psychological issues
- Social and school history
- Level of family support
- Stature of close family relatives  
(for genetic and environmental information)
- Associated co-morbidity  
eg metabolic syndrome, respiratory problems, hip (slipped capital femoral epiphysis) and knee (Blount's) problems, endocrine problems, diabetes, coronary heart disease (CHD), sleep apnoea, high blood pressure
- Underlying cause  
eg hypothyroidism, Cushing's syndrome, growth hormone deficiency, Prader-Willi syndrome, acanthosis nigricans
- Family history
- Non-medical symptoms  
eg exercise intolerance, discomfort from clothes, sweating
- Mental health

# Appendix C: 'Raising the issue of weight' tool for adults

## 1 RAISE THE ISSUE OF WEIGHT

If BMI is  $\geq 25$  and there are no contraindications to raising the issue of weight, initiate a dialogue:

'We have your weight and height measurements here. We can look at whether you are overweight. Can we have a chat about this?'

## 2 IS THE PATIENT OVERWEIGHT/OBESE?

BMI (kg/m <sup>2</sup> )	Weight classification
<18.5	Underweight
18.5–24.9	Healthy weight
$\geq 25$ –29.9	Overweight
$\geq 30$	Obese

Using the patient's current weight and height measurements, plot their BMI with them and use this to tell them what category of weight status they are.

'We use a measure called BMI to assess whether people are the right weight for their height. Using your measurements, we can see that your BMI is in the [overweight or obese] category [show the patient where they lie on a BMI chart]. When weight goes into the [overweight or obese] category, this can seriously affect your health.'

WAIST CIRCUMFERENCE	
Increased disease risk	
Men	Women
$\geq 40$ inches ( $\geq 102$ cm)	$\geq 35$ inches ( $\geq 88$ cm)
Asian men	Asian women
$\geq 90$ cm	$\geq 80$ cm

Waist circumference can be used in cases where BMI, in isolation, may be inappropriate (eg in some ethnic groups) and to give feedback on central adiposity. In Asians, it is estimated that there is increased disease risk at  $\geq 90$ cm for males and  $\geq 80$ cm for females.

Measure midway between the lowest rib and the top of the right iliac crest. The tape measure should sit snugly around the waist but not compress the skin.

## 3 EXPLAIN WHY EXCESS WEIGHT COULD BE A PROBLEM

If patient has a BMI  $\geq 25$  and obesity-related condition(s):

'Your weight is likely to be affecting your [co-morbidity/condition]. The extra weight is also putting you at greater risk of diabetes, heart disease and cancer.'

If patient has BMI  $\geq 30$  and no co-morbidities:

'Your weight is likely to affect your health in the future. You will be at greater risk of developing diabetes, heart disease and cancer.'

If patient has BMI  $\geq 25$  and no co-morbidities:

'Any increase in weight is likely to affect your health in the future.'

## 4 EXPLAIN THAT FURTHER WEIGHT GAIN IS UNDESIRABLE

'It will be good for your health if you do not put on any more weight. Gaining more weight will put your health at greater risk.'

## 5 MAKE PATIENT AWARE OF THE BENEFITS OF MODEST WEIGHT/ WAIST LOSS

'Losing 5–10% of weight [calculate this for the patient in kilos or pounds] at a rate of around 1–2lb (0.5–1kg) per week should improve your health. This could be your initial goal.'

If patient has co-morbidities:

'Losing weight will also improve your [co-morbidity].'

Note that reductions in waist circumference can lower disease risk. This may be a more sensitive measure of lifestyle change than BMI.

## 6 AGREE NEXT STEPS

Provide patient literature and:

- **If overweight without co-morbidities:** agree to monitor weight.
- **If obese or overweight with co-morbidities:** arrange follow-up consultation.
- **If severely obese with co-morbidities:** consider referral to secondary care.
- **If patient is not ready to lose weight:** agree to raise the issue again (eg in six months).

## BACKGROUND INFORMATION

### Raising the issue of weight

Many people are unaware of the extent of their weight problem. Around 30% of men and 10% of women who are overweight believe themselves to be a healthy weight.<sup>1</sup> There is evidence that people become more motivated to lose weight if advised to do so by a health professional.<sup>2</sup>

### Health consequences of excess weight

The table below summarises the health risks of being overweight or obese.<sup>3</sup> In addition, obesity is estimated to reduce life expectancy by between 3 and 14 years. Many patients will be unaware of the impact of weight on health.

#### Greatly increased risk

- type 2 diabetes
- gall bladder disease
- dyslipidaemia
- insulin resistance
- breathlessness
- sleep apnoea

#### Moderately increased risk

- cardiovascular disease
- hypertension
- osteoarthritis (knees)
- hyperuricaemia and gout

#### Slightly increased risk

- some cancers (colon, prostate, post-menopausal breast and endometrial)
- reproductive hormone abnormalities
- polycystic ovary syndrome
- impaired fertility
- low back pain
- anaesthetic complications

### Benefits of modest weight loss<sup>4</sup>

Patients may be unaware that a small amount of weight loss can improve their health.

Condition	Health benefits of modest (10%) weight loss
Mortality	<ul style="list-style-type: none"> <li>• 20–25% fall in overall mortality</li> <li>• 30–40% fall in diabetes-related deaths</li> <li>• 40–50% fall in obesity-related cancer deaths</li> </ul>
Diabetes	<ul style="list-style-type: none"> <li>• up to a 50% fall in fasting blood glucose</li> <li>• over 50% reduction in risk of developing diabetes</li> </ul>
Lipids	<ul style="list-style-type: none"> <li>• 10% fall in total cholesterol, 15% in LDL, and 30% in TG</li> <li>• 8% increase in HDL</li> </ul>
Blood pressure	<ul style="list-style-type: none"> <li>• 10 mmHg fall in diastolic and systolic pressures</li> </ul>

### Realistic goals for modest weight/waist loss (adapted from Australian guidelines)<sup>5</sup>

Duration	Weight change	Waist circumference change
Short term	2–4kg a month	1–2cm a month
Medium term	5–10% of initial weight	5% after six weeks
Long term	10–20% of initial weight	aim to be <88cm (females) aim to be <102cm (males)

Patients may have unrealistic weight loss goals.

### The need to offer support for behaviour change

The success of smoking cessation interventions shows that, in addition to raising a health issue, health professionals need to offer practical advice and support. Rollnick et al suggest some ways to do this within the primary care setting. Providing a list of available options in the local area may also be helpful.<sup>6</sup>

### Importance of continued monitoring of weight

Weight monitoring can be a helpful way of maintaining motivation to lose weight. Patients should be encouraged to monitor their weight regularly.<sup>7</sup> Interventions for smoking cessation have found that behaviour change is more successful when follow-ups are included in the programme.<sup>8</sup>

<sup>1</sup>Wardle J and Johnson F (2002) Weight and dieting: examining levels of weight concern in British adults. *Int J Obes* 26: 1144–9.

<sup>2</sup>Galuska DA et al (1999) Are health care professionals advising obese patients to lose weight? *JAMA* 282: 1576–8.

<sup>3</sup>Jebb S and Steer T (2003) Tackling the Weight of the Nation. Medical Research Council.

<sup>4</sup>Department of Health (2002) Prodigy Guidance on Obesity. Crown Copyright.

<sup>5</sup>NHMRC (2003) Clinical practice guidelines for the management of overweight and obesity in adults. Commonwealth of Australia.

<sup>6</sup>Rollnick S et al (2005) Consultations about changing behaviour. *BMJ* 331: 961–3.

<sup>7</sup>O'Neil PM and Brown JD (2005) Weighing the evidence: Benefits of regular weight monitoring for weight control. *J Nutr Educ Behav* 37: 319–22.

<sup>8</sup>Lancaster T and Stead LF (2004) Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews*, 4.

# Appendix D: 'Raising the issue of weight' tool for children and young people

## 1 WHEN TO INITIATE A DISCUSSION ABOUT WEIGHT

- If the family expresses concern about the child's weight.
- If the child has weight-related co-morbidities.
- If the child is visibly overweight.

## 2 RAISE THE ISSUE OF OVERWEIGHT

Discuss the child's weight in a sensitive manner because parents may be unaware that their child is overweight. Use the term 'overweight' rather than 'obese'. Let the maturity of the child and the child's and parents' wishes determine the level of child involvement.

**If a parent is concerned about the child's weight:**

'We have [child's] measurements so we can see if he/she is overweight for his/her age.'

**If the child is visibly overweight:**

'I see more children nowadays who are a little overweight. Could we check [child's] weight?'

**If the child presents with co-morbidities:**

'Sometimes [co-morbidity] is related to weight. I think that we should check [child's] weight.'

## 3 ASSESS THE CHILD'S WEIGHT STATUS

Refer to UK Child Growth Charts and plot BMI centile. Explain BMI to parent: eg 'We use a measure called BMI to look at children's weight. Looking at [child's] measurements, his/her BMI does seem to be somewhat higher than we would like it to be.'

If the child's weight status is in dispute, consider plotting their BMI on the growth chart in front of them. In some cases this approach may be inappropriate and upsetting for the family.

Overweight	Severely overweight
BMI centile ≥91st centile	BMI centile ≥98th centile

## 4 ASSESS SERIOUSNESS OF OVERWEIGHT PROBLEM AND DISCUSS WITH PARENT

If child is severely overweight with co-morbidities, consider raising the possibility that their weight may affect their health now or in the future.

This could be left for follow-up discussions or raised without the child present as some parents may feel it is distressing for their child to hear.

'If their overweight continues into adult life, it could affect their health. Have either you [or child] been concerned about his/her weight?'

Consider discussing these points with the parent at follow-up:

- **Age and pubertal stage:** the older the child and the further advanced into puberty, the more likely overweight will persist into adulthood.
- **Parental weight status:** if parents are obese, child's overweight is more likely to persist into adulthood.
- **Co-morbidities:** (see overleaf) increase the seriousness of the weight problem.

## 5 REASSURE THE PARENT/CHILD

If this is the first time that weight has been raised with the family, it is important to make the interaction as supportive as possible:

'Together, if you would like to, we can do something about your child's weight. By taking action now, we have the chance to improve [child's] health in the future.'

## 6 AGREE NEXT STEPS

Provide patient information literature, discuss as appropriate and:

- **If overweight and no immediate action necessary:** arrange follow-up appointment to monitor weight in three to six months: 'It might be useful for us to keep an eye on [child's] weight for the next year.'
- **If overweight and family want to take action:** offer appointment for discussion with GP, nurse or other health professional; arrange three-to-six-month follow-up to monitor weight.
- **If overweight and family do not wish to take action now:** monitor child's weight and raise again in six months to a year.
- **If overweight with co-morbidities:** consider referral to secondary care: 'It might be useful for you and [child] to talk to someone about it.'

## BACKGROUND INFORMATION

### Identifying the problem

Ascertaining a child's weight status is an important first step in childhood weight management. Parents who do not recognise the weight status of their overweight children may be less likely to provide them with support to achieve a healthy weight. In a British survey of parental perception of their child's weight, the overwhelming majority (94%) of parents with overweight or obese children misclassified their child's weight status.<sup>1</sup> Given this low level of parental awareness, health professionals should take care to establish a child's weight status in a sensitive manner.

### Assessing weight status in children

The child growth charts for the UK allow easy calculation of BMI based on a child's known weight and height.<sup>2</sup> Measures of body fat in children can also be a useful way of assessing a child's weight status. Details of body fat reference curves for children are now available,<sup>3</sup> although, in practice, body fat cannot be assessed without the necessary equipment.

### Assessing the severity of the problem

A number of factors are known to increase the risk of childhood obesity and the likelihood that a weight problem will persist into adult life. Considering these factors will help you to make an informed decision about the most appropriate mode of action.

- The older the child, the more likely it is that their weight problem will continue into later life and the less time they have to 'grow into' their excess weight.
- A child is 20–40% more likely to become obese if one parent is obese. The figure rises to around 80% if both parents are obese.
- While weight problems can lead to psychosocial issues such as depression and low self-esteem, weight loss may not necessarily resolve these problems, so don't rule out referral to CAMHS.

### Health risks of excess weight in childhood<sup>4,5</sup>

Being obese in childhood or adolescence increases the risk of obesity in adult life (see Appendix C for risks associated with adult obesity). Childhood obesity will also increase the chances of developing chronic diseases typically associated with adult obesity:

- insulin resistance and type 2 diabetes;
- breathing problems such as sleep apnoea and asthma;
- psychosocial morbidity;
- impaired fertility;
- cardiovascular disease;
- dyslipidaemia;
- hypertension;
- some cancers;
- orthopaedic complications.

### Importance of weight control

For many overweight children, prevention of further weight gain is the main goal because as long as they gain no more weight, they can 'grow into' their weight over time. This goal can be achieved through lifestyle changes:

- improving the diet, eg by increasing fruit and vegetable consumption, reducing fat intake and portion sizes, considering intake of sugary drinks, and planning meals;
  - increasing activity, eg playing football, walking the dog;
  - reducing sedentary behaviours such as time spent watching TV or playing computer games.
- If the child is more severely overweight, or has already reached adolescence, 'growing into' weight is more difficult and weight loss has to be considered.

### Need to offer solutions

Unless the child is severely overweight with co-morbidities, be led by the parents' and/or child's wishes. Encourage action if appropriate. Health professionals should be ready to offer referral support so that they are seen as taking the issue seriously. If the child is very overweight and has co-morbidities, the child (and family) may require on-going support despite referrals, eg through continued weight monitoring, additional specialist referrals, or help with family-based lifestyle modification.

<sup>1</sup>Carnell S et al (2005) Parental perceptions of overweight in 3–5 year olds. *Int J Obes* 29: 353–5.

<sup>2</sup>Cole T et al (2002) A chart to link child centiles of body mass index, weight and height. *Eur J Clin Nutr* 56: 1194–9.

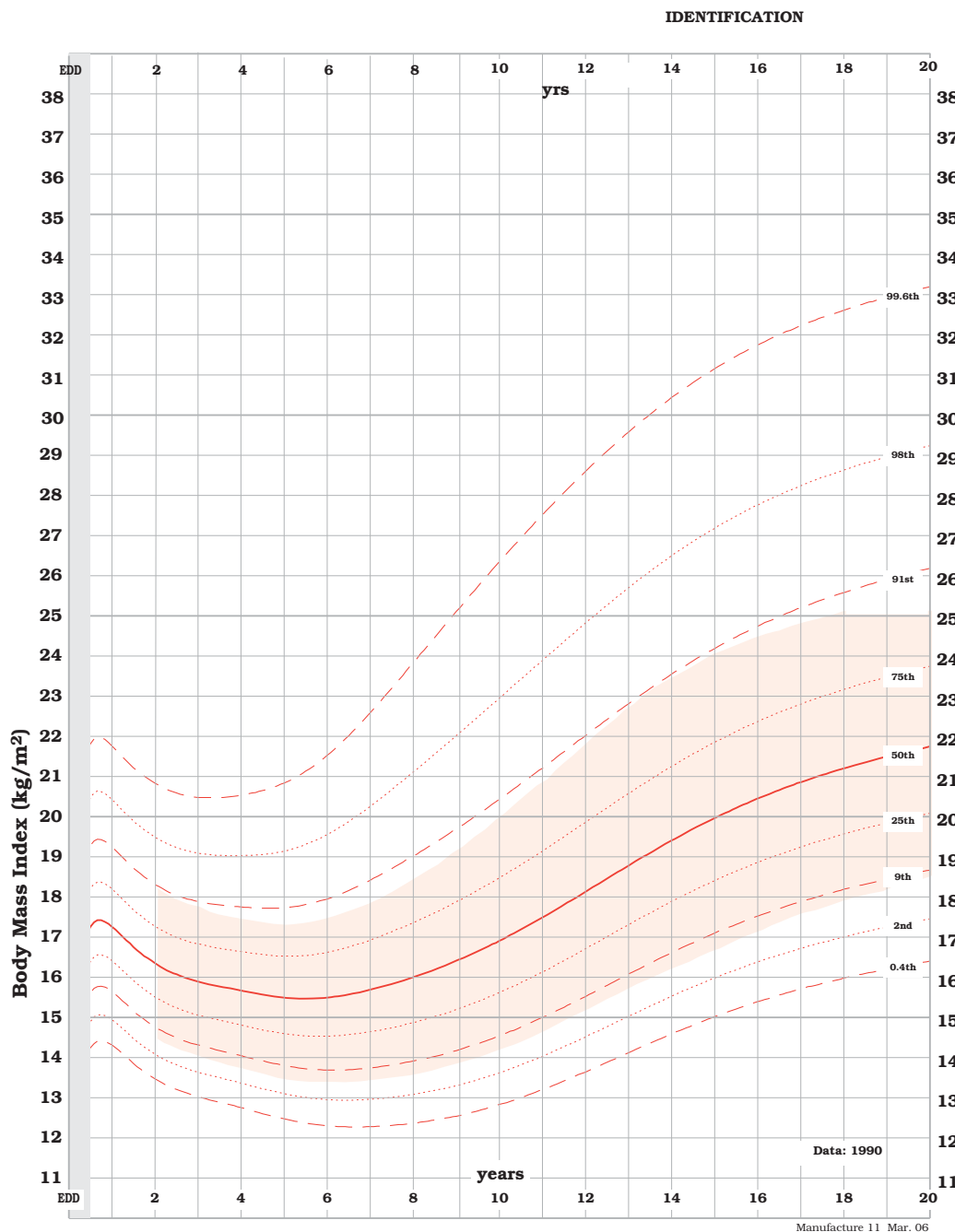
<sup>3</sup>Jebb S et al (2004) New body fat reference curves for children. *Obes Rev* (NAASO Suppl) A156.

<sup>4</sup>McCallum Z and Gerner B (2005) Weighty matters: An approach to childhood overweight in general practice. *Aus Fam Phys* 34(9): 745–8.

<sup>5</sup>British Medical Association Board of Science (2005) *Preventing Childhood Obesity*. BMA.

# Appendix E: Centile BMI charts for children

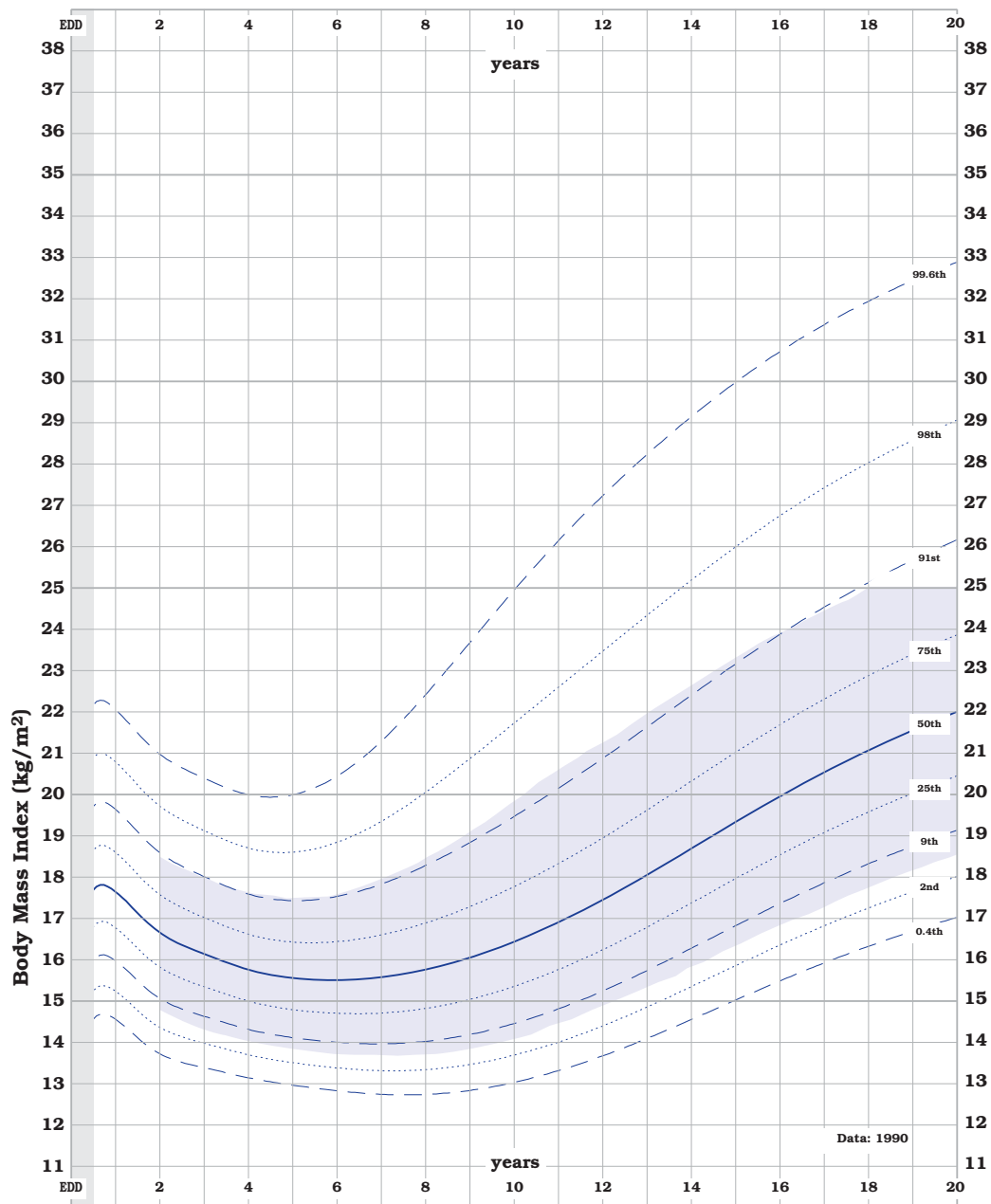
## GIRLS BMI CHART



### References

- Cole TJ, Freeman JV, Preece MA (1995) Body Mass Index reference curves for the UK, 1990. Arch Dis Child 73: 25–9.
- Cole TJ, Bellizzi MC, Flegal KM and Dietz WH (2000) Establishing a standard definition for child overweight and obesity: International survey. BMJ 320: 1240–3.

# BOYS BMI CHART



## References

- Cole TJ, Freeman JV, Preece MA (1995) Body Mass Index reference curves for the UK, 1990. *Arch Dis Child* 73: 25–9.
- Cole TJ, Bellizzi MC, Flegal KM and Dietz WH (2000) Establishing a standard definition for child overweight and obesity: International survey. *BMJ* 320: 1240–3.

Reproduced with kind permission of the Child Growth Foundation (Charity Reg. No. 274325).

© Child Growth Foundation 1997/1  
2 Mayfield Avenue, London W4 1PW







© Crown copyright 2006  
274539 1p 60k Apr06 (BEL)  
Produced by COI for the Department of Health  
First published April 2006

If you require further copies of this title quote *274539/Care pathway for the management of overweight and obesity* and contact:

DH Publications Orderline  
PO Box 777, London SE1 6XH  
**Email: [dh@prolog.uk.com](mailto:dh@prolog.uk.com)**

Tel: 08701 555 455  
Fax: 01623 724 524  
Textphone: 08700 102 870 (8am to 6pm Monday to Friday)

[www.dh.gov.uk/publications](http://www.dh.gov.uk/publications)