

Surgery for obesity in adulthood

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The relation between morbid obesity, serious morbidity, and early mortality is well known (fig 1 and table 1).^{1 2} A recent systematic review of over 890 000 participants found that each 5 point increase in body mass index (kg/m²) over 25 was associated with a 30% increase in overall mortality.³ Conservative approaches to managing obesity (dieting, exercise, and cognitive behavioural therapy) achieve long term weight loss in only a small minority of highly motivated individuals.⁴ Weight loss drugs such as orlistat and sibutramine produce modest weight loss and can be prescribed only for a short time.⁵ Bariatric (weight loss) surgery is the only treatment that randomised controlled trials have shown to produce effective long term weight loss.⁶ This review provides an overview of surgical procedures for adult obesity, including results, follow-up, and complications of surgery. It focuses mainly on practice in the United Kingdom.

Who should be considered for weight loss surgery?

Categories of obesity are classified according to body mass index (weight(kg)/(height (m)²)) (table 2). Recommendations on the management of obesity in adults are provided in guidelines published by the National Institute for Health and Clinical Excellence (NICE).¹

The NICE guidance states that surgical treatment is beneficial for people with obesity if they have a body mass index of ≥40, or between 35 and 40 if they have a coexisting disease that could be improved by weight loss (such as type 2 diabetes, high blood pressure, or sleep apnoea). All non-surgical methods should have failed to achieve or maintain clinically beneficial weight loss for at least six months. Surgery is appropriate only if the patient will receive specialist management, is fit for general anaesthesia, and is committed to long term follow-up.¹ Surgery can be considered as a first line option in patients with a body mass index >50. Evidence from the United States and Australia shows the benefit of bariatric surgery in patients with lower body mass indices (30 to 35).⁷ The NICE criteria do not specify an age limit for surgery, although general fitness for surgery is likely to play a major part in the selection of older patients.

What procedure should I follow when referring a patient for surgery?

In our own bariatric surgery practice we recommend that certain steps be taken as part of the assessment process, as illustrated in the treatment algorithm (fig 2).

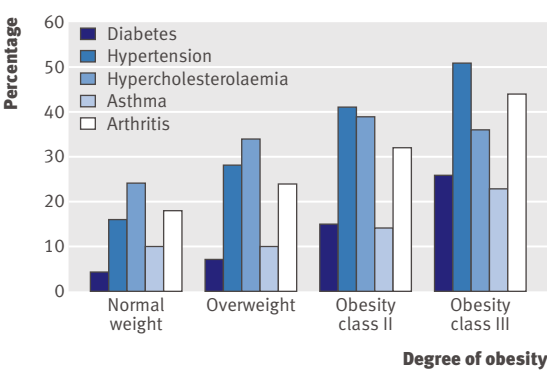


Fig 1 | Proportion of people with a major comorbidity, by degree of obesity. Adapted from Mokdad et al²

Table 1 | Risk of developing diseases associated with obesity. Data adapted from guidance from the National Institute for Health and Clinical Excellence¹

Relative risk	Diseases associated with metabolic consequences (indirect association)	Diseases associated with excess weight (direct association)
Greatly increased risk (>3)	Type 2 diabetes, gallbladder disease, hypertension, dyslipidaemia, insulin resistance, non-alcoholic fatty liver	Sleep apnoea, breathlessness, asthma, social isolation, depression, daytime sleepiness/fatigue
Moderately increased risk (2-3)	Coronary heart disease, stroke, gout	Osteoarthritis, respiratory disease, hernia, psychological problems
Slight increased risk (1-2)	Cancer, impaired fertility, polycystic ovaries, skin complications, cataract	Varicose veins, musculoskeletal problems, backache, stress incontinence, oedema/cellulitis

SUMMARY POINTS

Morbid obesity is associated with comorbidities and reduced life expectancy
Bariatric surgery is the only treatment for morbid obesity that has been shown to produce long term weight loss
Common procedures used for weight loss include gastric banding, Roux-en-Y gastric bypass, and sleeve gastrectomy
Bariatric surgery has been shown to lead to sustained weight loss, resolution of comorbidities, and improved life expectancy

Extra detail on surgical complications and future research, plus advice on pregnancy and travel, is in the full version of this article on bmj.com.

Table 2 | Classification of obesity based on body mass index thresholds

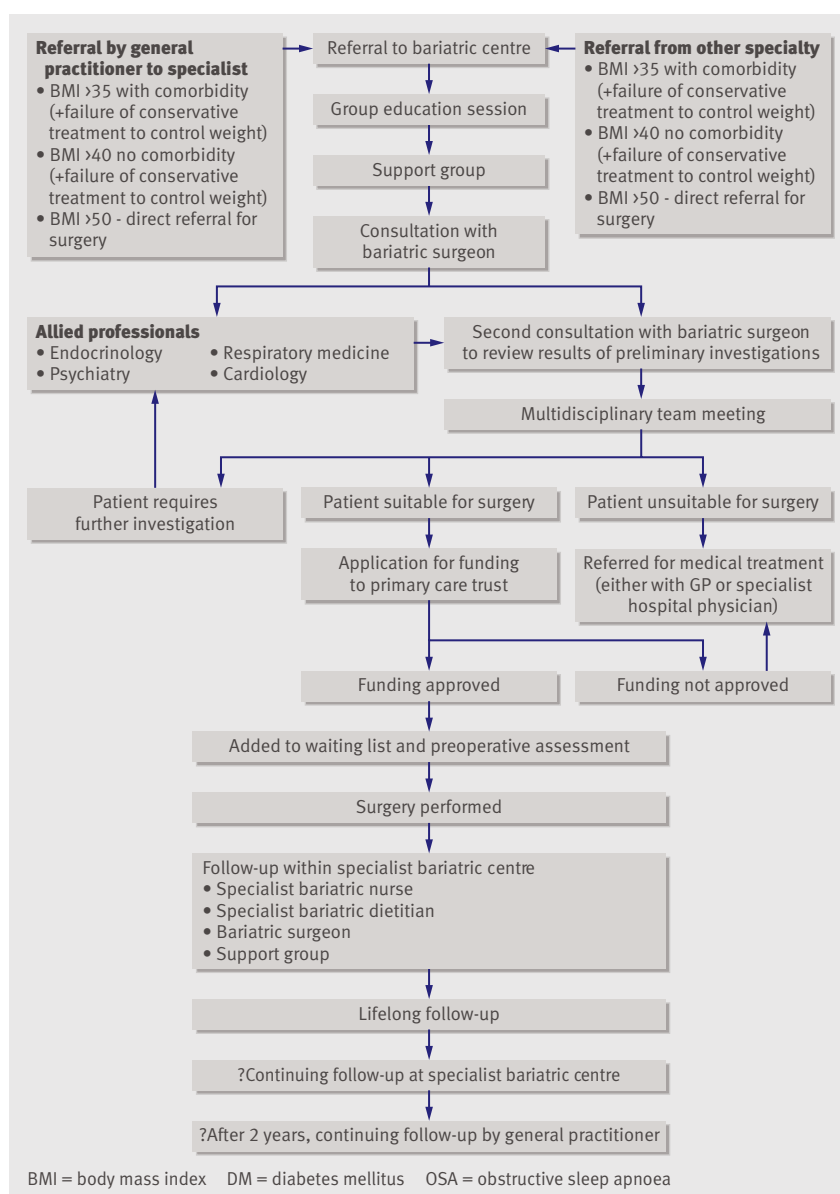
Body mass index (kg/m ²)	Classification
18.5-24.9	Normal weight
25.0-29.9	Overweight
30.0-34.9	Obesity type I
35.0-39.9	Obesity type II
≥40.0	Morbid obesity/obesity type III
≥50.0	Super obesity

In the United Kingdom, funding for bariatric surgery must be applied for on an individual patient basis from the primary care trust, which must apply the NICE guidelines in its selection process. Thus it is important to ensure that patients meet the criteria for surgical intervention, not only in terms of their body mass index and associated comorbidities but also in terms of previous efforts at losing weight through dieting, exercise, and medical treatment.¹ The exact process for applying for funding and the particular information required by the primary care

trust will vary between trusts. Some trusts allocate funding before surgical referral, whereas in others funding can only be applied for by the surgical service after the cycle of assessment of the patient has been completed. The primary care trust should be informed that the patient is being referred for consideration of surgery.

Helpful referral information from the general practitioner includes:

- The patient's weight and body mass index (and trends in these two variables), as well as weight loss achieved through non-surgical means (for most patients this means dieting, exercise, and medical treatment)
- Presence or absence of associated comorbidities that could be improved by surgery or affect the patient's fitness for a particular surgical procedure
- Details of psychiatric, psychological, and social history, including any history of eating disorders and their treatment.

**Fig 2 | Referral algorithm for patients considered suitable for bariatric surgery**

Box 1 | What is the role of the multidisciplinary team?

Who is in the team?

Patients are managed by a multidisciplinary team, which includes bariatric surgeons, anaesthetists, cardiologists, respiratory physicians, endocrinologists, psychiatrists, and specialist nurses and dietitians.

Example process involving a multidisciplinary team

- In our North London Obesity Surgery Service, all patients referred for bariatric surgery attend a group education session run by the specialist nurse and dietitian before being seen in the clinic. During the session they learn about the different surgical procedures, the relative risks and benefits of these, and the long term results
- After the education session patients are invited to attend a support group meeting where they have an opportunity to talk to patients who have undergone the various procedures
- At the initial consultation with a surgeon the patient's conformity with the NICE guidelines is confirmed, fitness for surgery evaluated, and preferred procedure ascertained. The patient is then referred for further investigation as indicated
- Specialist psychiatric assessment before surgery will identify eating disorders and the need for cognitive behavioural therapy and any other mental health problems likely to influence the success of surgery
- Once these investigations are completed the patient's case is discussed at a multidisciplinary team meeting. A risk-benefit analysis is performed. The team may suggest further preoperative investigation—such as echocardiography, cardiopulmonary exercise testing, and an endocrine or cardiology review—and they consider which procedure is likely to be most appropriate based on a patient's body mass index, target weight, dietary history (such as sweet eating and binge eating behaviour), likely weight loss, severity of comorbidities (and the potential risks of undergoing a particular procedure)
- The multidisciplinary team makes its decisions on a case by case basis. Patients deemed unsuitable for surgery are referred for medical weight loss treatment either at a specialist clinic or with their general practitioner. Only under exceptional circumstances does the team refuse surgery, and this is usually because the risks are considered too great. The patient's wishes about the type of procedure they undergo are always respected

Box 2 | Dietary advice after bariatric surgery

The basic principles are similar for all procedures.

Quantity of food and drink

Patients should reduce their energy intake to promote weight loss.

Quality of food and drink

Patients may not have been eating a healthy diet before the procedure, so give advice on what represents a healthy and unhealthy diet and ensure they have a balanced diet containing adequate amounts of protein, energy, vitamins, minerals, and micronutrients.

Weeks 1 and 2 after surgery

Liquids can include coffee, tea, low energy squashes, unsweetened fruit juices, clear and smooth soups, and “build-up” drinks; liquids high in sugar should be avoided.

Weeks 3 and 4 after surgery

Advise patients to consume a “soft” diet. Suggested foods include minced meat, cottage pie, flaky fish in a sauce, omelette, scrambled eggs, pasta, soft pulses, well cooked vegetables, yoghurt, fromage fraise, and stewed fruit.

Week 5 onwards

Patients can start taking more textured food. They should:
Aim to eat a meal the size that a 2 year old would eat (meal on a side plate rather than a dinner plate)
Chew all food well and eat slowly (taking 20 minutes to eat a meal) and stop eating as soon as they no longer feel hungry.

Supplements after Roux-en-Y gastric bypass

A vitamin B-12 injection every three months
Multivitamin and mineral as well as calcium and iron supplementation, preferably given in liquid or chewable tablet form

Some patients can find the changes in diet and lifestyle after surgery difficult to come to terms with and require a degree of psychological self reliance and resilience, in addition to support from professionals and family. A history of psychiatric illness is not a contraindication to surgery. Although not essential, it is helpful to record any potential causes for obesity as well as dietary habits and a history of physical exercise and to identify reasons for failure of conservative measures to control weight. The patient must be committed to lifelong follow-up. Bariatric surgery is a tertiary referral practice involving a multidisciplinary team approach (box 1).

What surgical procedures are available?

The most commonly performed procedures are gastric banding, Roux-en-Y gastric bypass, sleeve gastrectomy, and biliopancreatic diversion (table 3). Vertical banded gastroplasty (stomach stapling) is rarely, if ever, performed now because of its high long term failure rate.⁶

In gastric banding (fig 3) a band is placed around the upper part of the stomach. It is connected to a port under the skin into which saline can be injected or withdrawn. This allows the band to be inflated and deflated. The aim of increasing restriction is to reduce hunger and provide a feeling of satiety after eating a small meal.

In sleeve gastrectomy (fig 4) most of the body and all of the fundus of the stomach are resected to leave a long narrow tube of stomach.

In a Roux-en-Y gastric bypass a small gastric pouch is formed by division of the upper stomach, on to which the jejunum is joined, so that food bypasses the stomach and upper small bowel (fig 5).

Two surgical procedures (Scopinaro biliopancreatic diversion and biliopancreatic diversion with duodenal switch) function by bypassing most of the small bowel, leaving a small segment through which nutrients can be absorbed. Operative details for these two procedures differ but the common themes are that food passes through a segment of small bowel about 250 cm long and that a shorter segment of this (50-150 cm) receives both food and digestive juices (fig 6).

How effective is weight loss surgery?**Surgery versus conventional treatment**

Results of surgery are evaluated by change in weight or body mass index, or percentage loss of excess body weight and by resolution or improvement in comorbidities. Excess body weight is calculated by subtracting the ideal weight of a patient, assuming a body mass index of 25, from his or her actual weight.¹¹

Surgery is more effective at ensuring weight loss and controlling comorbidities than medical treatment.^{12 w1} Published data from the prospective, randomised controlled Swedish Obese Subjects Study, show the benefits of gastric surgery in moderately obese and morbidly obese patients compared with conventional treatment.¹² Greater weight loss occurred after gastric surgery (gastric bypass 32%, vertical banded gastroplasty 25%, and gastric banding 20%) than with conventional treatment (2%).¹² These findings accord with an Australian prospective randomised study of gastric banding versus conventional treatment in patients with mild to moderate obesity.^{w1} At two years, the surgical group had greater weight loss, with a mean of 21.6% of initial weight lost and 87.2% of excess weight lost, whereas the non-surgical group had a loss of 5.5% of initial weight and 21.8% of excess weight.^{w1}

Results of surgery

A systematic review of bariatric surgery published in 2006 examined 43 studies.⁸ The mean percentage excess weight loss for Roux-en-Y gastric bypass was higher than for laparoscopic adjustable gastric banding at one and two years (67% v 42% and 67% v 53% respectively).⁸ The excess weight loss for laparoscopic adjustable gastric banding at 8 years was 59% and for Roux-en-Y gastric bypass at 10 years was 52%.⁸ These differences were not statistically significant.⁸

A recent series involving 1140 patients undergoing gastric banding showed an excess weight loss of 59% at 36 months,^{w2} and a further series involving 591 patients, with a 10 year follow-up period, showed a loss of excess body weight of 83% at 10 years.¹¹

Table 3 Comparisons between the different types of bariatric operations

Category	Sleeve gastrectomy	Laparoscopic adjustable gastric band	Roux-en-Y gastric bypass	Biliary pancreatic diversion with duodenal switch
Technical difficulty	Straightforward	Straightforward	Complex	Complex
Hospital stay	2-3 days	1 day or day case	2-3 days	2-3 days
30 day mortality (%)	0.36 to 1.46	0.05	0.50	0.8
Reversibility	Irreversible	Straightforward	Complex	Complex
Start of weight loss	Immediate	Six weeks	Immediate	Immediate
Excess weight loss at 10 years (%)	Not available	59 (at 8 years)	52	>77
Remission of type 2 diabetes (% of patients)	Immediate in some cases, a few weeks or months in others (81)	Associated with weight loss (60)	Immediate (80)	Immediate (85)
Complications	Weight regain, heart burn	Erosion, slippage, symmetrical dilatation, port related problems; rate of repeat operation >10%	Anastomotic leak, dumping syndrome, vitamin deficiencies	Anastomotic leak, dumping syndrome, vitamin deficiencies, malnutrition

Data for mortality and weight loss for gastric banding and Roux-en-Y gastric bypass were derived from a systematic review on outcomes after bariatric surgery.⁸ Mortality and morbidity data for sleeve gastrectomy was obtained from a combination of Spanish⁹ and German National Registries.¹⁰

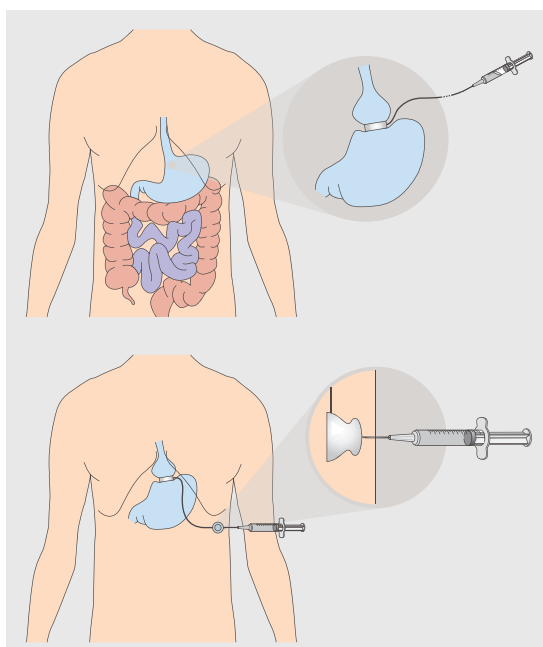


Fig 3 | Gastric banding. Top: Gastric band around the upper stomach. Bottom: The relative positions of the gastric band and port. The port is attached to the anterior abdominal wall and accessed percutaneously with a special (Huber) needle, which has its lumen placed on the side to avoid coring out the silastic seal of the port and thus avoids a leak

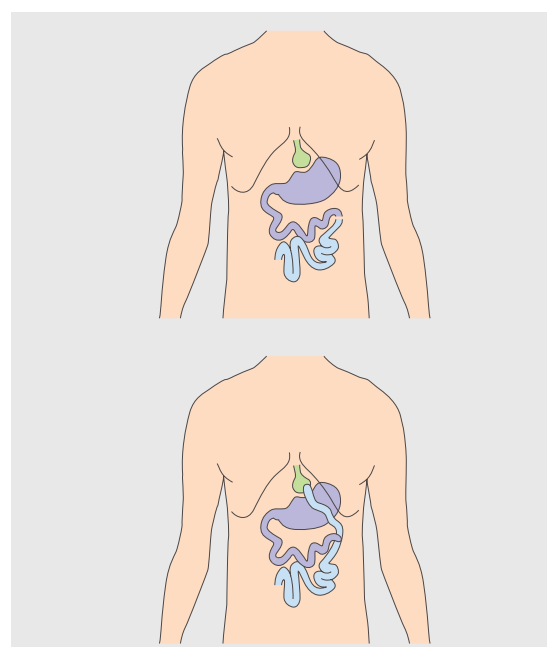


Fig 5 | Laparoscopic Roux-en-Y gastric bypass. Top: The gastric pouch is made from the upper stomach. The upper small bowel is divided 80 cm below the duodenojejunal flexure. The small bowel below this (blue) will become the alimentary limb and the small bowel above this will become the biliopancreatic limb (purple). Bottom: The bowel has been rejoined

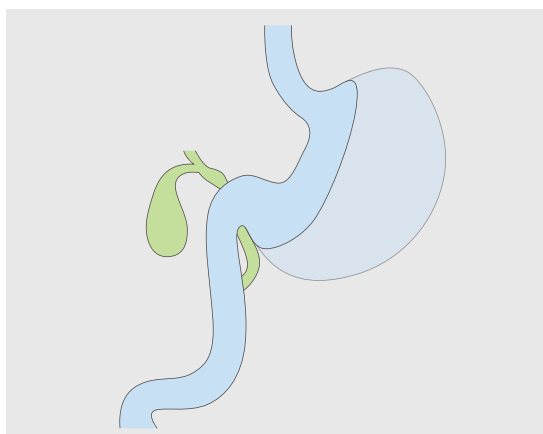


Fig 4 | Sleeve gastrectomy, showing the portion of stomach removed (light blue shading)

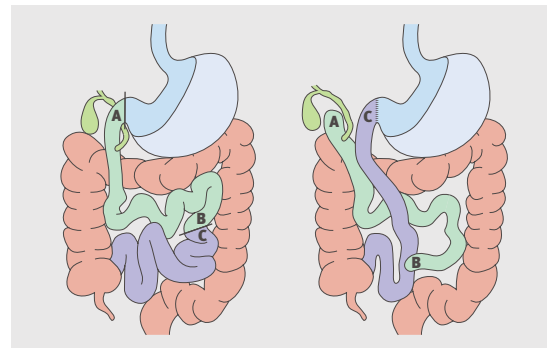


Fig 6 | Laparoscopic biliopancreatic diversion with duodenal switch. Left: A sleeve gastrectomy has already been performed. The small bowel has been divided just beyond the pylorus (at A) and 250 cm from the ileocaecal valve (between B and C). Right: The configuration once the bowel is rejoined

However, in some series, gastric banding is also associated with high long term complication and failure rates.^{13 w3} In one report 128 (34%) of 380 patients had their bands removed and only 25% (63) of the remaining 252 patients achieved >50% excess weight loss.¹³ In another report 105 (33%) of 317 patients developed late complications and 22% (69) required major revision surgery.^{w3} At seven years the band failure rate was 37%. In the patients who still had the band in place, the mean excess weight loss at five years (58.5%) was consistent with findings in other series.^{w3} When these data were analysed on the basis of “intention to treat” and the results of failed band surgeries included, the percentage excess weight loss at five years was reduced to about 42%.

A large prospective study involving 1500 patients having a Roux-en-Y gastric bypass reported an excess body weight loss of 69% at one and two years and 62% at three years. Compared with gastric banding, Roux-en-Y gastric bypass surgery provides greater and more consistent weight loss, and fewer patients require repeat surgery for complications.^{14 15} A prospective randomised trial comparing sleeve gastrectomy with gastric banding found that three years after surgery a greater reduction in body mass index was achieved with sleeve gastrectomy (median reduction in body mass index 27.7 (range 0-39) versus 18 (range 0-48)).¹⁵ The long term results of sleeve gastrectomy are not yet available.

Weight loss is greater after biliopancreatic diversion with duodenal switch than after other bariatric procedures.¹⁶ However, it is a more complex procedure with significantly greater risks of protein energy malnutrition; micronutrient, mineral, and vitamin deficiencies; anaemia; osteopenia; and intractable diarrhoea.⁶ Despite its effectiveness in promoting weight loss and its ability to prevent the regain in weight seen four years after Roux-en-Y gastric bypass surgery, it is the least commonly performed bariatric procedure in the United Kingdom. This is possibly because it is only slightly better in promoting weight loss than Roux-en-Y gastric bypass, and protein energy malnutrition and vitamin and micronutrient deficiencies are common and can appear insidiously, making close follow-up essential.

Quality of life and resolution of comorbidities after surgery

A large cohort study showed that surgical intervention leads to considerable improvements in the management of obesity related comorbidities and health related quality of life when compared to patients treated with diet alone.¹⁷ At two years, the incidence of hypertension is lower in patients who have had surgery (3%) than those receiving conventional treatment (10%).¹⁷ A systematic review and meta-analysis of the resolution of type 2 diabetes after bariatric surgery found a total remission rate of diabetes in 78% (associated with 55% excess weight loss) of patients and improvement in 87%.¹⁸ The relative effectiveness in resolving type 2 diabetes for gastric banding, gastropasty, Roux-en-Y gastric bypass, and biliopancreatic diversion with duodenal switch was 56.7% (excess weight loss 46.2%), 79.7% (55.5%), 80.3% (59.7%), and 95.1% (63.6%) respectively.¹⁸ The resolution of type 2 diabetes occurs immediately after Roux-en-Y gastric bypass and biliopancreatic diversion with duodenal switch, whereas with gastric banding resolution is dependent on weight loss. This may take several years, and diabetes will not resolve if the patient fails to lose weight. Resolution of type 2 diabetes after sleeve gastrectomy occurs immediately in some patients but does not occur for some time in others.

Bariatric surgery reduces mortality in patients with a body mass index >35.^{12 19 20} A recent longitudinal study found that the overall mortality of obese patients was 0.68% in the surgically treated group (vertical banded gastropasty and Roux-en-Y gastric bypass) and 6.17% in obese patients who had not had bariatric surgery.²⁰ The Swedish Obese Subjects Study found fewer deaths related to myocardial infarction and cancer in the surgically treated group,¹² and Adams et al found a 40% reduction in mortality in surgically treated obese patients.¹⁹ Even when the risks of death associated with surgery are taken into account, the patients who have surgery are more likely to be alive one year after surgery than the patients who choose conservative treatment.²⁰ The risk of death from all types of bariatric surgery is very low (0.28%; adjustable banding 0.05%, gastric bypass 0.5%).²¹

A PATIENT'S PERSPECTIVE

As a child I was always bigger than other children but was crazy about swimming. As a teenager I loved walking. When I started nursing at age 18, I was a size 14.

I soon put on weight. I had poor eating habits and had given up swimming and walking. Over the years as my weight gradually increased, I tried various diets and pills. I would lose 3-4 stone (19-25 kg) over several months then put it all back on and more. I knew about the health risks associated with morbid obesity, but the amount I needed to lose seemed insurmountable. When I reflected on my weight, I would feel quite low.

While pregnant with my daughter, Grace, I was about 20 stone, and I was aware that any number of emergencies could occur because of my weight. But after Grace's birth I ate whatever I liked because I was breast feeding. Soon the weight piled on again.

I was determined that Grace would not miss out on life and forced myself to take

her to mother and toddler groups and swimming. I became increasingly tired. At this point I was 24 stone. I became more desperate, more aware of how much I had to lose: a loving partner and a baby. I was aware that my life expectancy was going to be short. I researched laparoscopic gastric bypass surgery and spoke to a colleague who had had the procedure.

At my initial consultation for surgery I weighed 150 kg and was a size 34. I was breathless and tired. Walking was difficult, and I was getting back and knee pain. After surgery, early in 2007, the first few months were difficult as I had to relearn how to eat and listen to my body.

Life is completely different now. I am 12st 7lb and size 14. I no longer have breathing problems, tiredness, or pain. Friends and family have difficulty keeping up with me. As a family we are more active and health conscious. Our portion sizes are much smaller. I enjoy going into shops to buy clothes, and I love my partner telling me I look great.

SOURCES AND SELECTION CRITERIA

We conducted a literature review using Medline and Embase databases and the Cochrane Library using the following headings: "Obesity", "Bariatric", and "Surgery". Most studies were of class II-IV evidence, being derived from case series. We included randomised controlled trials where available and have identified them in the text. We also reviewed epidemiological data from the World Health Organization, hospital episode statistics, and the International Association for the Study of Obesity. We refer to our own experience from a UK specialist practice.

What dietary guidelines should patients follow after surgery?

A detailed review of all aspects of bariatric surgery, including dietary requirements and deficiency states, has been compiled by the American Association for Metabolic and Bariatric Surgery, the American Association of Clinical Endocrinologists, and the Obesity Society.²² A more accessible document, written specifically for general practitioners can be found on the UK's National Obesity Forum's website (www.nationalobesityforum.org.uk/images/stories/documents/NOF-Medical-management.pdf). Box 2 outlines the principles of dietary advice after bariatric surgery.

The Roux-en-Y gastric bypass bypasses the upper small bowel and leads to the relative malabsorption of nutrients normally absorbed at this site. These nutrients are iron, calcium, and fat soluble vitamins (A, D, E, and K) as well as some micronutrients such as copper and zinc. In addition, vitamin B-12 does not mix with intrinsic factor as it normally would in the stomach and so its absorption in the terminal ileum is reduced. All patients should have regular blood tests to detect deficiency states and be given additional supplementation as indicated.

What complications of surgery might the generalist encounter in the medium to long term?

Mechanical problems with a gastric band include slippage, erosion of the band into the stomach, symmetrical dilatation of the gastric pouch, and fracture or disconnection of the tubing or displacement of the port.

Erosion of the band into the stomach often presents with a loss of restriction and weight regain but may present with mild to moderate pain. Slippage and symmetrical dilatation present with dysphagia. Occasionally, patients with slippage of the gastric band will present with acute, severe dysphagia and pain. These patients should be referred to the hospital as an emergency since gastric perforation and peritonitis may result.

Long term complications after gastric bypass are less frequent. Ulceration at the gastrojejunal anastomosis may lead to upper abdominal pain, and strictures may develop at this site. Fortunately, seven out of 10 strictures are amenable to dilatation. Occasionally, internal hernias, presenting as small bowel obstruction, may occur. Diagnosing the cause

QUESTIONS FOR FUTURE RESEARCH

- What is the role of bariatric surgery in managing patients with type 2 diabetes who have a body mass index <35?
- What is the role of bariatric surgery in treating obese patients with a body mass index 30-35?
- What is the role and efficacy of the Endobarrier device, an endoscopically inserted 60 cm impermeable sleeve that produces a non-surgical duodenojejunal bypass?
- What is the role of ileal interposition grafting in metabolic and bariatric surgery?

of small bowel obstruction can be difficult, and in contrast with the normal practice of watching and waiting, early laparoscopy is necessary for patients with such features. Other problems include dumping syndrome, which is best avoided by separating eating and drinking at meal times and by avoiding drinks with high sugar load. Protein energy malnutrition is uncommon.

The insidious development of malnutrition and deficiency states is a particular problem with biliopancreatic diversion. Sleeve gastrectomy may produce anaemia if there is ulceration of the stomach. Stenosis and substantial weight regain after dilatation of the sleeve may also occur.

Is weight loss surgery cost effective?

In 2002, data from a report prepared for a House of Commons select committee estimated that the direct costs of treating obesity within the National Health Service were between £45.8m (£52.1m; \$74.5m) and £49m.²³ The costs of treating the consequences of obesity were thought to amount to nearly £1075m a year. In 2005 over 871 000 prescription items were dispensed for the treatment of obesity compared with 127 000 in 1999.²⁴

The costs of bariatric surgery must be balanced against the cost of continuing medication, hospital visits, and treatment that would be required if the patient did not have surgery. A study from the United States estimated the investment in a bariatric procedure of between \$17 000 and \$26 000 could be recouped within 25 months if the procedures were laparoscopic and 53 months if open.²⁵ Examination of the cost per quality adjusted life year (QALY) for bariatric surgery has shown that bariatric surgery is more cost effective than conservative treatment.²⁶ Studies from European countries also suggest that bariatric surgery is more cost effective than conventional treatment.²⁷

A study of working practices found that significantly more patients worked after surgery than worked before (76% v 58%); significantly more patients worked longer hours than they did before (35.8 h v 30.1 h); and fewer patients claimed welfare benefits (19 respondents claimed 32 benefits before surgery and six claimed eight benefits after surgery).²⁸ Additional benefits included the fact that patients felt less limited in the kind of work they could do and had less difficulty in performing tasks.²⁸

ADDITIONAL EDUCATIONAL RESOURCES

Resources for healthcare professionals

- The American Society for Metabolic and Bariatric Surgery (www.asmb.org/)—For overview of weight loss surgery and history of bariatric surgery
- International Federation for the Surgery of Obesity and Metabolic Disorders (www.ifso.com/)—Access to journals and information on obesity related conferences
- International Association for the Study of Obesity (www.iaso.org/index.asp)—Access to new data and approaches to management and prevention of obesity
- National Institute for Health and Clinical Excellence. Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. 2006. Clinical guideline 43. www.nice.org.uk/CG43
- National Obesity Forum (www.nationalobesityforum.org.uk/)—An independent charity working to improve the prevention and management of obesity
- World Health Organization (www.who.int/topics/obesity/en/)—For facts and figures on the scale of obesity as an international problem

Resources for patients

- British Obesity Surgery Patient Association (www.bospa.org)—Provides information and support to patients who are considering or have had bariatric surgery
- WLSinfo (www.wlsinfo.org.uk)—A UK charity providing information and support to patients who are considering or have had bariatric surgery
- North London Obesity Surgery Service (www.whittington.nhs.uk/default.asp?c=6160)—The website of the North London Obesity Surgery Service offers advice and help to patients and professionals. It is available to all patients referred to the service for bariatric surgery, which includes patients from outside London

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Patient consent obtained.

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