

# Lancet: Bariatric surgery series

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On Feb. 3, 2014 *The Lancet Diabetes & Endocrinology* will publish a series of review articles on bariatric surgery. The series covers current and controversial topics in bariatric surgery, including safety, guidelines for use, and mechanisms.

More than 500 million adults worldwide now have obesity, which is a major risk factor for other disorders including type 2 diabetes and cardiovascular disease. Bariatric [surgery](#) is the most effective treatment for both obesity and type 2 diabetes. In people with type 2 diabetes, [bariatric surgery](#) can not only stop this disease from getting worse, but can actually reverse complications.

However, current recommendations for when bariatric surgery should be used are restrictive, which means that some people who could benefit hugely from this surgery are not eligible. Only people with a BMI greater than 40 kg/m<sup>2</sup>—or greater than 35 kg/m<sup>2</sup> in the presence of other related diseases—qualify for surgery. In the UK, a patient is eligible only after all other treatment options have been exhausted.

## **Editorial: Bariatric surgery: why only a last resort?**

"Bariatric surgery has substantial benefits in terms of weight loss, metabolic status, and quality of life. It is safe and effective, and the future savings made through prevention of comorbid diseases could counterbalance its high cost. The surgery should, therefore, be available as an option to use when appropriate, and not only when all other options have been eliminated. Bariatric surgery offers a real opportunity for

preventing comorbid diseases and complications of obesity. If it is only used as a final resort, this opportunity will be missed."

### **Comment: Is bariatric surgery safe?**

"When we misconstrue severe obesity as a self-induced or behavioural problem, instead of a physiological dysregulation, we are likely to reject surgery as being an inappropriate and overly aggressive solution. We also overestimate the benefits of lifestyle and pharmacological interventions, and can often misinterpret the risk:benefit ratio of these surgical procedures. Certainly, not all patients with diabetes should be deemed surgical candidates, but compliant patients who are resistant to optimum medical treatments ought to have a surgical consultation sooner rather than later in the course of their disease.

### **Comment: Quality of life after bariatric surgery**

"When bariatric surgery leads to sustained weight loss, this outcome is reflected in consistently positive health-related quality of life benefits. The continued development, standardisation, and rigorous validation of the patient-reported outcome instruments, along with future work to develop a core set of outcomes to be reported as a minimum after surgery in trials, registries, and individual practices, will provide quality assurance and allow for comparisons between groups and populations, providing an essential element in health outcomes research."

### **Metabolic surgery: shifting the focus from glycaemia and weight to end-organ health**

Bariatric surgery is the most effective treatment for weight loss and glycaemic control. The focus of clinical studies and clinical experience has predominantly been on the numerical reductions of bodyweight and

glucose after surgery. In this Series paper, we examine evidence on the efficacy of bariatric surgery for pancreatic, renal, retinal, peripheral nervous, cardiovascular, hepatic, and reproductive end-organ damage or disease. The overall conclusions are that, in most cases, patients' end-organ damage is expected to either stabilise or improve postoperatively. However, some of these clinical outcomes have not been assessed with robust methods and, in many cases, do not have support from randomised controlled clinical trials comparing bariatric surgery with non-surgical interventions. Such trials are urgently needed to inform patients and clinicians on whether the risks of surgery outweigh the significant benefits for end-organ health.

## **Mechanisms of changes in glucose metabolism and bodyweight after bariatric surgery**

Bariatric surgery is the most effective treatment for obesity and also greatly improves glycaemic control, often within days after surgery, independently of weight loss. Laparoscopic adjustable gastric banding (LAGB) was designed as a purely restrictive procedure, whereas vertical sleeve gastrectomy (VSG) and Roux-en-Y gastric bypass (RYGB) induce changes in appetite through regulation of gut hormones, resulting in decreased hunger and increased satiation. Thus, VSG and RYGB more frequently result in remission of type 2 diabetes than does LAGB. With all three of these procedures, remission of diabetes is associated with early increases in insulin sensitivity in the liver and later in peripheral tissues; VSG and RYGB are also associated with improved insulin secretion and an exaggerated postprandial rise in glucagon-like peptide 1. The vagal pathway could have a role in the neurohumoral regulatory pathways that control appetite and glucose metabolism after bariatric surgery. Recent research suggests that changes in bile acid concentrations in the blood and altered intestinal microbiota might contribute to metabolic changes after surgery, but the mechanisms are

unclear. In this Series paper, we explore the possible mechanisms underlying the effects on glucose metabolism and bodyweight of LAGB, VSG, and RYGB surgery. Elucidation of these mechanisms is providing knowledge about bodyweight regulation and the pathophysiology of type 2 diabetes, and could help to identify new drug targets and improved surgical techniques.

## **Bone loss after bariatric surgery: causes, consequences, and management**

Bariatric surgery is an effective and increasingly common treatment for severe obesity and its many comorbidities. The side-effects of bariatric surgery can include detrimental effects on bone and mineral metabolism. Bone disease in patients who have had bariatric surgery is affected by preoperative abnormalities in bone and mineral metabolism related to severe obesity. Changes that arise after bariatric surgery are specific to procedure type: the most pronounced abnormalities in calciotropic hormones and bone loss are noted after procedures that result in the most malabsorption. The most consistent site for bone loss after all bariatric procedures is at the hip. There are limitations of dual-energy x-ray absorptiometry technology in this population, including artefact introduced by adipose tissue itself. Bone loss after bariatric surgery is probably multifactorial. Proposed mechanisms include skeletal unloading, abnormalities in calciotropic hormones, and changes in gut hormones. Few data for fracture risk in the bariatric population are available, and this is a crucial area for additional research. Treatment should be geared toward correction of nutritional deficiencies and study of bone mineral density in high-risk patients. We explore the skeletal response to bariatric surgery, potential mechanisms for changes, and strategies for management.

## **Beyond BMI: the need for new guidelines governing**

## the use of bariatric and metabolic surgery

Bariatric surgery use is largely governed worldwide by a 1991 National Institutes of Health consensus statement that advocates BMI as the primary operative criterion and restricts surgery to severely obese patients. These guidelines have been enormously valuable in standardising practice, thereby facilitating accumulation of a copious database of information regarding long-term surgical benefits and risks, from vast clinical experience and research. However, the National Institutes of Health recommendations had important limitations from the outset and are now gravely outdated. They do not account for remarkable advances in minimally invasive surgical techniques or the development of entirely new procedures. In the two decades since they were crafted, we have gained far greater understanding of the dramatic, weight-independent benefits of some operations on metabolic diseases, especially type 2 diabetes, and of the inadequacy of BMI as a primary criterion for surgical selection. Furthermore, there is now a substantial and rapidly burgeoning body of level-1 evidence from randomised trials comparing surgical versus non surgical approaches to obesity, type 2 diabetes, and other metabolic diseases, including among only mildly obese or merely overweight patients. Herein, we present arguments to impel the development of new guidelines for the use of bariatric and so-called metabolic surgery to inform clinical practice and insurance compensation.

**More information:** [www.thelancet.com/journals/landia/issue/current](http://www.thelancet.com/journals/landia/issue/current)

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