



SCOTTISH COMMITTEE FOR ORTHOPAEDICS & TRAUMA (SCOT)

SCOTTISH ARTHROPLASTY PROJECT (SAP)

SCOTTISH ORTHOPAEDIC SERVICE DELIVERY GROUP (SOSDG)

CLINICAL GUIDELINE

Joint Replacement in Patients with Obesity and other Modifiable Risk Factors

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments. Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty. If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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BACKGROUND

Joint Replacement

Total joint replacement is an excellent operation that is usually very effective at relieving pain and improving function. It is a significant undertaking for the patient and it is important to understand that it cannot be reversed. There are several rare but potentially life-changing complications that can occur. Modifiable risk factors should be reduced or eliminated, wherever possible, before surgery is considered. It is important to explain these risks to the patient during the consent process. *For some patients the risk of complications may outweigh the potential benefits and therefore surgery would not be advised.*

Obesity

Obesity is an abnormal and excessive accumulation of fat that presents a risk to health. It is a complex, multi factorial disease. It can affect people who do not overeat and those who exercise regularly. The presence of obesity is determined by calculating the Body Mass Index (BMI): a person's weight (in kilograms) divided by the square of his or her height (in metres). A person with a BMI of 30 or more is generally considered obese. BMI can be inaccurate in some circumstances. Men with a waist size of 94cm or more and women with a waist size of 80cm or more are more likely to develop obesity related problems (<https://www.nhs.uk/conditions/obesity/>). Being obese is a risk factor for a number of chronic illnesses, including diabetes, cardiovascular diseases and cancer (<https://www.who.int/topics/obesity/en/>).

Reducing obesity and the consequent healthcare inequalities is a high priority of NHS Scotland.

Obesity is also defined into the following categories, using the Body Mass Index (BMI: height / weight²):

- Overweight 25-29.9
- Class I Obesity (obese) 30-34.9
- Class II Obesity (severe obesity) 35-39.9
- Class III Obesity (morbid obesity) 40-49
- Super obesity 50+

Obesity and Joint Replacement

In a patient with obesity the functional outcome from lower limb arthroplasty is similar to a patient of normal weight. The patient is at an elevated risk of complications, which increase proportionally with increasing obesity and other comorbidity.

A recent meta-analysis of outcomes following total knee replacement (TKR) in the presence of obesity identified a risk-ratio of all-causes revision of 1.19 in those with class II obesity, 1.93 in those with morbid obesity and 4.75 in those with super-obesity. The risk ratio for septic revision was 1.49 in those with severe obesity, 3.69 in those with morbid obesity and 4.58 in those with super-obesity.¹

A similar meta-analysis from the same group examined total hip replacement (THR). There was an increased risk of septic revision in the severe obesity group (RR=3.17). In the morbidly obese group the risk-ratio was 9.75, while the risk-ratio was 7.22 in the super-obese group. The risk of aseptic revision was not significantly elevated.² It should however be recognised that these risks are relative to a baseline very low risk in arthroplasty patients.

A recent study examined pain and functional outcome alone without assessment of complications. Results were reported at an early time point of 6 months. There were similar outcomes of pain relief and function improvement in the obese group compared with the non-obese group.³ Similar findings were reported in the previously discussed meta-analyses.^{1,2}

A study of weight loss prior to TKR demonstrated that loss of 20lbs resulted in reduced hospital stay and a reduction in complications (<https://uk.reuters.com/article/us-health-knee-surgery-obesity/study-finds-weight-loss-target-for-morbidly-obese-before-knee-surgery-idUKKCN1R02IM>)

Therefore pre-operative weight loss may lead to:

- Reduced pain and improve function and reduce the need for surgery.
- Reduced complications:
 - Deep and superficial surgical site infection
 - Loosening
 - Component wear
 - Cardiovascular events
 - AKI
 - VTE

Other Modifiable Risk Factors

A recent consensus statement for perioperative care in THR and TKR patients has been published and makes the following recommendations for pre-operative risk factor modification⁴.

Factor	Evidence Level	Recommendation Grade
Smoking cessation > 4 weeks ⁵⁻⁷	High	Strong
Correction of pre-operative anaemia (Hb < 12 g/dL females or 13 g/dL males) ⁸	High	Strong
Alcohol Cessation ^{9,10}	Low	Strong

The presence of Diabetes Mellitus has been recognised as increasing the risk of complications after joint replacement. In particular, the combination of obesity and features of metabolic syndrome may increase the risk of periprosthetic deep infection.¹¹⁻¹³ An HBA1c of <69mmol/mol should be achieved prior to surgery. There is emerging evidence that lower limits of 59mmol/mol may result in a further reduction in complications and guidance may change in the future as evidence emerges (such as the role of fructosamine as a predictor).

National Advice

A decision of the SPSO (201800839) advised that boards should:

“ensure that their approach in dealing with referrals of patients with a high BMI is flexible, in line with available guidance and adopts a holistic approach when deciding whether to carry out surgery...the board should ensure that patients with a high BMI who are seeking surgery are fully assessed...the board should remind staff of the GMC guidance on consent and emphasise that the offer of a 2nd opinion should not be limited to those occasions when the doctor is considering to offer treatment that they would not ordinarily do so...”

The 2013 British Hip Society (BHS) Commissioning guidance (https://www.britishhipsociety.com/uploaded/Pain%20arising%20from%20the%20hip%20in%20adults_11Nov_formatted.pdf) states that:

“age, gender, smoking, obesity and co-morbidity should not be barriers to referral... patients with significant co-morbidities [systemic or local] should have appropriate investigations and treatment to optimise their condition before referral.”

A recent BOA statement in January 2019 (<https://www.boa.ac.uk/resources/press-releases-and-statements/boa-and-rcs-joint-response-to-the-sunday-times-article-on-hip-and-knee-surgery-in-obese-patients.html>):

“...Osteoarthritis, which may lead to the need for a hip or knee replacement, is a complex, multifactorial disease. Obesity might hasten and worsen symptoms but it is not a primary cause of osteoarthritis. In recent years, many clinical commissioning groups have begun to restrict access to hip and knee replacement surgery for obese patients – denying or delaying their surgery until they have lost weight. While it’s absolutely right that the NHS looks at how it helps patients to lose weight for their overall health, it is unfair, and goes against the principles of the NHS, to make it a condition of receiving treatment. Hip and knee replacements are some of the most clinically effective and economical treatments available on the NHS, greatly improving the quality of life for those patients who receive them.”

Legal Position

The relevant law pertaining to a patient’s right to treatment: [R (on the application of Burke) v General Medical Council [2005] EWCA Civ 1003]

Autonomy and the right of self-determination does not entitle the patient to insist on receiving a particular medical treatment regardless of the nature of the treatment. Insofar as a doctor has a legal obligation to provide treatment this cannot be founded simply upon the fact the patient demands it.

(i) The doctor exercising his professional clinical judgment decides what treatment options are clinically indicated (i.e. will provide overall clinical benefit) for his patient

(ii) He then offers those treatment options to the patient in the course of which he explains to him/her the risks, benefits, side effects, etc. involved in each of the treatment options

(iii) The patient then decides whether he wishes to accept any of those treatment options and, if so, which one. In the vast majority of cases, he will, of course, decide which treatment option he considers to be in his best interests and, in doing so, he will or may take into account other, non-clinical, factors. However, he can, if he wishes, decide to accept (or refuse) the treatment option on the basis of reasons which are irrational or for no reasons at all

(iv) If he chooses one of the treatment options offered to him, the doctor will then proceed to provide it

(v) If, however, he refuses all of the treatment options offered to him and instead informs the doctor that he wants a form of treatment which the doctor has not offered him, the doctor will, no doubt, discuss that form of treatment with him (assuming that it is a form of treatment known to him) but if the doctor concludes that this treatment is not clinically indicated he is not required (i.e. he is under no legal obligation) to provide it to the patient although he should offer to arrange a second opinion.

Guidance surrounding consent has been shaped recently by the Montgomery ruling which states (Montgomery v Lanarkshire Health Board [2015] UKSC 11):

'The doctor is therefore under a duty to take reasonable care to ensure that the patient is aware of any material risks involved in any recommended treatment, and of any reasonable alternative or variant treatments.'

'The test of materiality is whether, in the circumstances of the particular case, a reasonable person in the patient's position would be likely to attach significance to the risk, or the doctor is or should reasonably be aware that the particular patient would be likely to attach significance to it.'

Equality Impact

Laws are now in place which are designed to protect people from unfair discrimination due to their personal characteristics. Referred to as 'protected characteristics', these include age, disability, gender reassignment, marriage & civil partnership, pregnancy & maternity, sex, race, religion & belief and sexual orientation.

This guidance aims to improve equality by reducing variation in the approach to obesity and lower limb arthroplasty. The guidance builds on pre-existing NHS Scotland and Scottish Government guidance on the overall management of obesity through public health interventions and weight management services.

The guidance is the distillation of evidence and a consensus of clinical opinion. Its overall aim aligns with pre-existing obesity strategies and the need to deliver realistic and high quality care. Introduction of this guideline is likely to reduce the need for surgery. Where surgery is still required, it is likely to reduce the risk of significant complications.

GUIDELINE

1. Patients with arthritis should be assessed and managed holistically. The severity of symptoms and risk of progression should be balanced against the presence of risk factors for complication during surgical treatment.
2. A “shared decision making” model should be used to make all treatment decisions. The “BRAN” questions should be used:
 - a. What are the **B**enefits?
 - b. What are the **R**isks?
 - c. What are the **A**lternatives?
 - d. What if I do **N**othing?
3. In most cases patients with arthritis should be offered nonoperative management in accordance with the advice in NICE Clinical Guideline 177. This is likely to have already commenced in primary care.
4. Orthopaedic assessment should take account of the:
 - a. Severity of symptoms
 - b. Chance of improvement with nonoperative management
 - c. Risk of progression of symptoms and need for more complex procedure with delay to surgery.
5. If the level of symptoms leads to consideration of joint replacement, the risk of complications should be reduced by addressing any modifiable risk factors. This requires collaboration between the patient, orthopaedic clinician, AHP and general practitioner (GP). It also requires adequate provision of appropriate support services by health boards.
 - a. Diabetic control should be optimised through diet and, where necessary, medication. This may require input from the patient’s general practitioner and, in more complex cases, secondary care diabetic teams. The risk of complications is reduced where the HBA1c < 69 mmol/mol. There is emerging evidence that lower thresholds may be advisable.
 - b. Smokers should be advised to give-up smoking for at least 4 weeks prior to surgery. Patients may be signposted to local smoking cessation resources to aid long term cessation.
 - c. Alcohol cessation should be advised.
 - d. Pre-operative anaemia should be investigated and managed appropriately.
6. Assessment of obesity should include measurement of BMI and assessment of fat distribution. The following ranges are not intended as strict cut-offs but a guide to assist surgeons and patients in sharing decision making. They reflect the increasing rate of complications observed in the literature.

7. Where the patient is obese but the BMI is < **40 kg/m²** the decision to proceed to surgery should be shared between the patient and clinician. The patient should be informed that they are at a slightly increased risk of complications with increased obesity. It is appropriate to recommended weight loss while awaiting surgery.
8. In patients with a **BMI greater than 40 kg/m²** the risks are significantly increased. Joint replacement may, however, remain an effective treatment. Decision making should be shared with the patient. For many patients weight loss prior to surgery may be appropriate. There may be patients who at the initial appointment have a BMI > 40 kg/m² but due to symptom severity and potential disease progression the surgeon is of the opinion that the benefits of surgery may outweigh the risks.
9. Weight management services should be available locally. The referral criteria and methods vary across boards and clinicians should familiarize themselves with their particular local arrangements. Consideration should be given to involvement of other specialisms such as endocrinology and bariatric surgery where appropriate and available. Every effort should be made to minimise the need for recurrent waiting on different waiting lists.
10. **Patient Initiated Return (PIR)** should be available to for a patient to return to the orthopaedic clinic after attempts to modify their risk factors. They should not need to be re-referred by their GP §. If the BMI remains >40 kg/m² surgery may be contemplated where both the clinician and patient agree that it is advisable on the basis of symptom severity and where any further delay may be detrimental in terms of disease progression and the complexity of any future joint replacement surgery. The increased risk of complications should be discussed. These discussions must be fully recorded in the medical record.
11. Where patients are managed via the Golden Jubilee National Hospital, they should be able to access local Weight Management Services and local Patient Initiated Return (PIR) on the same basis as patients referred and reviewed by local orthopaedic teams.
12. Surgical preassessment pathways should be robust and provide the option of early anaesthetic review. These pathways should link with primary care and other services that can assist in reducing risk factors.
13. If there is disagreement between clinician and patient a second opinion should be offered. This second opinion should initially be obtained expeditiously within the same board. If the second opinion supports surgery then this should be performed on a named consultant basis.

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Notes

Methodology

Protocols and guidelines were sought from all Scottish Health Boards via SCOT Committee links. These were received and disseminated among the committee. The positions were synthesised into this statement and guideline. It was discussed at the Winter SCOT Meeting (January 2020). There was further discussion among the core group of approving signatories for SCOT, SOSDG and SAP. The final document comprises a consensus of opinion among the Chairs of the main orthopaedic quality improvement and leadership bodies in Scotland.

Provision of Services to Assist in Risk Factor Modification

In many cases the document recommends access to evidence-based effective support to modify risk factors for complications. It is the responsibility of the whole team to assess and optimise risk factors. This should start in the community prior to referral to secondary care. Risk factors should also be assessed during the initial orthopaedic consultation and at subsequent pre-assessment appointments.

Close coordination with primary care is required to optimise many risks factors such as diabetes. When identified early, these should be addressed prior to listing.

Patients should be signposted to self-help resources via NHS Inform and local pharmacies (i.e. smoking cessation advice).

Provision needs to be made at Health Board level for services to support risk factor modification to reduce subsequent complications associated with arthroplasty

§ Patient Initiated Return

PIR is the ability of a patient to directly contact secondary care to request a return appointment. This is appropriate to empower patients while making most efficient use of outpatient capacity. Some patients in Scotland may be initially seen at GJNH as part of "See and Treat". Pathways should be developed to allow patients to thereafter access local risk modification services and return to the most appropriate orthopaedic service thereafter.

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Web Resources

<http://www.healthscotland.scot/health-topics/diet-and-healthy-weight/obesity>

<http://www.healthscotland.scot/publications/standards-for-the-delivery-of-tier-2-and-tier-3-weight-management-services-in-scotland>

<https://www.scotpho.org.uk/media/1154/scotpho170727-obesity-and-health-inequalities-in-scotland-summary-report.pdf>

<https://www.gov.scot/publications/healthier-future-scotlands-diet-healthy-weight-delivery-plan/pages/2/>