

Subacromial shoulder pain BESS/BOA Patient Care Pathways



Shoulder & Elbow
0(0) 1–9
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DOI: 10.1177/1758573215576456
sel.sagepub.com



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Introduction

Definition

Subacromial shoulder pain is commonly located to the top and lateral side of the shoulder. It is exaggerated by overhead activity and can be associated with night pain. It is usually associated with full passive range of movement of the glenohumeral joint. The pain originates from the subacromial space of the shoulder, an area made up of the rotator cuff tendons and the subacromial bursa. This area is separate to the main glenohumeral joint. Pain from this area is mainly caused by rotator cuff tendinopathy, also referred to as ‘shoulder impingement’. Impingement occurs between the under-surface of the acromion (roof of shoulder) and the rotator cuff tendons. These tendons can be either intact or torn. A number of other terms such as supraspinatus tendinopathy, tendinitis and bursitis are also used across different disciplines but the diagnosis is essentially the same and referred to in this document as rotator cuff tendinopathy/impingement.

Shared decision-making

The General Medical Council’s *Good Medical Practice Duties of a Doctor* guide¹ clearly states in the section on working in partnership with patients that doctors’ should:

- Listen to patients and respond to their concerns and preferences.
- Give patients the information they want or need in a way they can understand.

- Respect patients’ right to reach decisions with the doctor about their treatment and care.
- Support patients in caring for themselves to improve and maintain their health.

This can only be achieved by direct consultation between the patient and their treating clinician. Decisions about treatment taken without such direct consultation between patient and treating clinician are not appropriate, as they do not adhere to principles of good medical practice.

Background

- The prevalence of shoulder complaints in the UK is estimated to be 14%, with 1–2% of adults consulting their general practitioner annually regarding new-onset shoulder pain.²
- Of new onset shoulder pain, *subacromial shoulder pain* from rotator cuff pathology, including, tendonitis, calcific tendonitis, and rotator cuff tears, reportedly accounts for up to 70% of all shoulder pain problems.³
- Other causes of shoulder pain (glenohumeral pain) such as frozen shoulder and osteoarthritis are dealt with in separate pathway guidelines.

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- Painful shoulders pose a substantial socioeconomic burden. Disability of the shoulder can impair ability to work or perform household tasks and can result in time off work.^{4,5}
- Shoulder problems account for 2.4% of all general practitioner consultations in the UK and 4.5 million visits to physicians annually in the USA.^{6,7} More than 300,000 surgical repairs for rotator cuff pathologies are performed annually in the USA, and the annual financial burden of shoulder pain management has been estimated to be US\$3 billion.⁸
- A mechanical explanation for subacromial impingement has been proposed, whereby contact occurs between the rotator cuff tendons and the overlying acromion and coracohumeral ligament. Rotator cuff pathology is associated with progressive change in the shape of the acromion, with 'spurs' forming at its antero-inferior margin narrowing the subacromial space, thereby making physical contact between tendons and spur more likely during certain positions and movements of the arm. It is most notable during arm abduction and is sometimes called a 'painful arc'. This process is argued to result in inflammation of the rotator cuff tendons (particularly the supraspinatus tendon) and the overlying subacromial bursa. A conflicting theory suggests that such mechanisms are not causative and that intrinsic age related degeneration of the tendon is the main determinant of inflammation and symptoms.^{9,10}
- A further common cause of subacromial shoulder pain is rotator cuff tear. The term tear refers to structural failure in one or more of the four muscles and tendons that form the rotator cuff. These tears can be either acute (traumatic) or chronic. Any tear that does not extend all the way through the tendon is termed a partial-thickness tear.
- It is estimated that the overall prevalence of rotator cuff tears is 34% and that risk increases significantly with age.¹¹ Partial tears are more prevalent than full-thickness tears.¹²

Subacromial shoulder pain: care pathway

Aims of treatment

The overall treatment aim for the conditions that cause *subacromial pain* is to 'improve pain and function'; however, treatment success needs to be defined individually with patients in a shared decision-making process. The degree of improvement and level of acceptance to a patient will depend on starting level of symptoms, patient demographics, personal circumstances and patient expectations.

Pre-primary care (at home)

For the causes of *subacromial shoulder pain*, there is potential for simple patient self management strategies and prevention strategies at home prior to the need for a general practitioner consultation, although research to develop and assess the impact of such strategies would be needed.

Primary care/community triage services

- Diagnosis is based on History and Examination (Figure 1).
- Making the correct diagnosis is very important and will ensure an efficient and optimum treatment experience for the patient. Primary Care doctors can work through the algorithm in Figure 1; if they arrive at the section highlighted in yellow, then a diagnosis of rotator cuff tendinopathy/impingement is highly likely.
- The algorithm in Figure 1 emphasizes the importance of passive external rotation in making a diagnosis of rotator cuff tendinopathy/impingement: the main cause of subacromial pain.
- Features of importance are:
 - Patient expectation
 - Hand dominance
 - Occupation and level of activity or sports
 - Location, radiation and onset of pain
 - Duration of symptoms
 - Exacerbating and relieving factors
 - History of trauma
 - Involvement of other joints
 - Systemic illnesses and comorbidities
 - Red flags (Figure 1)

Red flags for the shoulder

Acute severe shoulder pain needs proper and competent diagnosis. Any shoulder 'red flags' identified during primary care assessment need urgent secondary care referral.

- A suspected infected joint needs same day emergency referral.
- An unreduced dislocation needs same day emergency referral.
- Suspected tumour and malignancy will need urgent referral following the local 2-week cancer referral pathway.
- An acute cuff tear as a result of a traumatic event needs urgent referral and ideally should be seen in the next available outpatient clinic.

Although acute calcific tendinopathy is not a red flag, it is severely painful, often mimicking malignant pain and

Diagnosis of Shoulder problems in Primary Care: Guidelines on treatment and referral

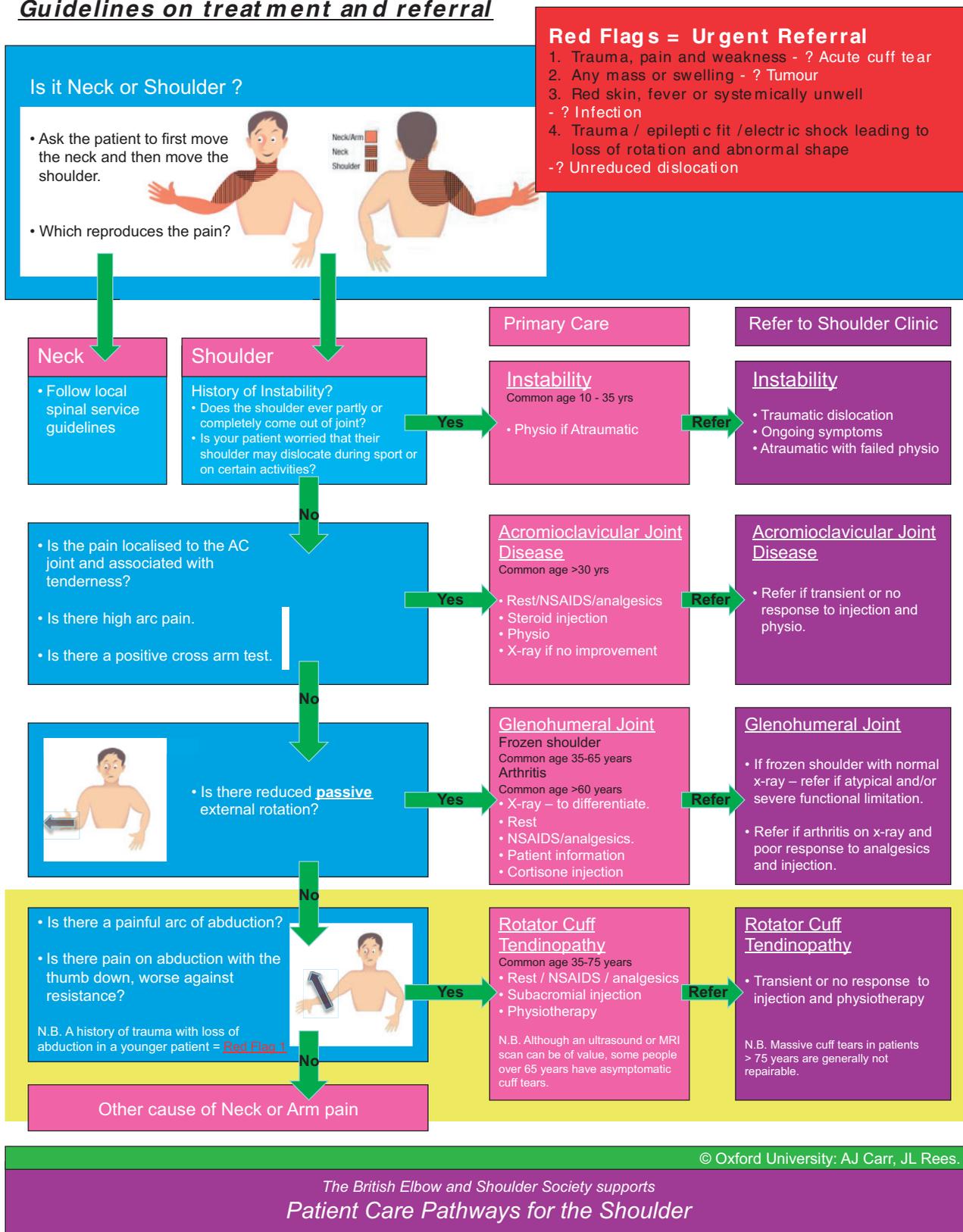


Figure 1. Diagnosis of shoulder problems in primary care. Guidelines on treatment and referral.

usually necessitates an early secondary care referral for more interventional treatment.

It should also be noted that patients with subacromial shoulder pain in which the symptoms and signs suggest a more systemic inflammatory joint disease, should be considered as a 'rheumatological red flag'. Any new inflammatory oligo or polyarthritis, with symptoms of inflammation in several joints, should be referred urgently (following local rheumatology referral pathways) because time is of the essence with these diseases and a prompt diagnosis with early commencement of disease modifying drugs where appropriate is essential.

Treatment in primary care/community triage services

- Adopt shared decision-making and define treatment goals, taking into account personal circumstances.
- Conservative treatment should, in general, include rest, exercise, physiotherapy, analgesics and *no more* than two corticosteroid injections. (Although not fully established, evidence is emerging that repeated frequent corticosteroid injections may cause tendon damage.)
- Failure of these community treatments will prompt secondary care referral.
- Physiotherapy rehabilitation is usually for 6 weeks unless patients are unable to tolerate the exercises, or physiotherapists identify a reason for earlier referral to secondary care. If there is patient improvement in the first 6 weeks of physiotherapy, then a further 6 weeks therapy is justified.
- Treatment timelines should include primary care and intermediate care time. Intermediate care should not delay appropriate referral to secondary care.
- Although shoulder X-rays with two views in primary care can be useful in patients not improving with conservative treatment, imaging of the rotator cuff with ultrasound (US) or magnetic resonance imaging (MRI) is rarely indicated in primary care.
- A normal rotator cuff US does not exclude serious shoulder pathologies such as tumour and glenohumeral osteoarthritis. Similarly, the presence of a rotator cuff tear on imaging does not always correlate with symptoms and does not imply a definite need for surgery in every case.
- Ultrasound is user-dependent and the accuracy of US in identifying rotator cuff tears varies. A report of a partial thickness tear is common, such partial thickness tears can be asymptomatic or the consequence of false positive reporting. This type of imaging is therefore more usefully performed after secondary care referral when it can help direct secondary care treatment when conservative care has

failed. Any positive US findings need to be interpreted by shoulder surgeons in the context of patient symptoms, disability and response to treatment. Referrals to secondary care should therefore be based on patient symptoms, disability and response to conservative treatment (rather than US reports). Wider use of US in primary care will likely increase secondary care referrals.

Secondary care

- Confirm diagnosis with history and examination and confirm appropriate conservative treatment has taken place in primary care as a proportion of patients with subacromial pain will respond to conservative treatment.¹³
- Consider imaging with US/MRI to assess the integrity of rotator cuff muscles and tendons.
- The most frequent indication for surgery is persistent or significant pain and loss of function despite conservative treatment.
- Shared decision-making with patient after counselling patient fully regarding operative and non-operative options.
- Ensure multidisciplinary approach to care with availability of specialist physiotherapists and shoulder surgeons.
- In the absence of a rotator cuff tear, if impingement symptoms fail to resolve with conservative treatment, subacromial decompression surgery (acromioplasty) is recommended.
- Subacromial decompression (acromioplasty) surgery aims to excise the bony spur on the antero-inferior surface of the acromion. The operation also involves excision of bursal tissue on the under surface of the acromion and release of the coraco-acromial ligament. The procedure aims to increase the volume of the subacromial space, thereby reducing the mechanical attrition and painful irritation of the rotator cuff tendons.
- In some cases, the acromioclavicular joint (ACJ) is implicated in the causation of subacromial pain. In such cases, an additional procedure of excision arthroplasty of the ACJ (open or arthroscopic) may be indicated. This decision should be made by the surgeon based on a combination of the clinical findings and the correlation with imaging.
- Surgery is also recommended in cases of chronic full-thickness rotator cuff tear with persistent shoulder pain and weakness if conservative treatment has failed.
- A rotator cuff repair operation aims to re-attach the tendons to bone. In general, two approaches are available for surgical repair. Open surgery involves the rotator cuff being repaired under direct vision

through an incision in the skin. Arthroscopic surgery involves the repair being performed through arthroscopic portals into the shoulder. If indicated, additional procedures of subacromial decompression and excision arthroplasty of the ACJ may need to be performed in association with the tendon repair.

- If the rotator cuff tear is acute (red flag), surgical assessment is needed as a matter of urgency.
- It would be expected that surgical units performing subacromial decompression surgery and rotator cuff repair surgery:
 - Ensure patients undergo some form of pre-operative assessment, to ensure fitness for surgery and to ensure social plans are in place for same day or next day discharge
 - Surgery takes place in appropriately resourced and staffed units
 - Subacromial decompression is usually day case or 23 hour admission (depending on the time of day that surgery takes place), unless clinical or social circumstances dictate otherwise
 - Rotator cuff repair surgery should be either day case or overnight stay
 - Standard postoperative care usually involves a sling, analgesia, patient instructions and information on wound care and exercises
 - Up to three outpatient follow-up appointments may be routinely needed
 - Physiotherapy services vary across the country, although six sessions of physiotherapy would be considered normal after subacromial decompression. More physiotherapy is usually needed with rotator cuff repair, where full benefit may not be reached for 6 months to 12 months after surgery

Linked metrics

Subacromial Decompression for Impingement

- Diagnosis codes M75.1 M75.3 M75.4 M75.5
- Procedure codes (OPCS 4.4) W08.2 (with Z68.2 – acromion process of scapula) W84.4 (often used for ACJ decompression especially if used with Z81.2 – ACJ)
- Procedure codes (OPCS 4.5) O29.1

NB Y76.7 is added for arthroscopic approach to joint Rotator Cuff Repair

- Diagnosis codes M75.1 M75.3 M75.4 M75.5
- Procedure codes (OPCS 4.4 and 4.5) T79.1 T79.3 T79.4 T79.5

NB Y76.7 is added for arthroscopic approach to joint

Outcome metrics

- Length of stay – day case (23 hours) and overnight.
- Re-admission rate within 3 months.
- Oxford Shoulder Score, pre-operatively and 12 months after surgery.
- Infection.
- Data from any National Registries.

Research

- Patient-reported outcome measures – a validated clinical score, preferably a patient-reported outcome measure (PROM), should be used pre-operatively and at 1 year after treatment.
- Acceptable scores include; the Oxford Shoulder Score (OSS) and the Shoulder Pain and Disability Index (SPADI).
- EQ 5D Scores should be captured pre-operatively and 1 year after intervention to allow for a health economic analysis
- BESS members lead two National Multicentre Trials of Rotator Cuff Shoulder Surgery
 - The United Kingdom Rotator Cuff Trial (UKUFF) is funded by the National Institute for Health Research (NIHR) Health Technology Assessment Programme and aims to investigate the effectiveness and cost-effectiveness of open versus arthroscopic cuff repair. Trial recruitment was successfully completed in February 2012 and will be reported in 2015 (www.herc.ox.ac.uk/research/ukuff)
 - The Can Shoulder Arthroscopy Work (CSAW) trial is funded by Arthritis Research UK (ARUK) and aims to compare effectiveness and cost effectiveness of Arthroscopic Subacromial Decompression versus Arthroscopy alone versus Observation. It began recruitment in July 2012 and aims to report in 2015 (www.ndorms.ox.ac.uk/clinicaltrials.php?trial=csaw)

Quality specification: audit

- Oxford Shoulder Score pre-operatively and at 1 year follow-up.
- Consider National Registry.

Directory: patient/public/clinician information

- Patient and public information – ensure all available information is provided regarding the benefits and risks of all treatment options.
- Clinician information -ensure access to available evidence.

Evidence: subacromial shoulder pain as a result of rotator cuff tendon disorders, impingement/tendonitis, calcific tendonitis and rotator cuff tear

Evidence for effectiveness and cost effectiveness of treatment

A search of Medline, Embase and The Cochrane Library up to August 2009 has been undertaken.¹⁴ Harm alerts from relevant organisations such as the US Food and Drug Administration (FDA) and the UK Medicines and Health care products Regulatory Agency (MHRA) were included. The review found 71 systematic reviews, RCTs, or observational studies that met the inclusion criteria. A GRADE evaluation of the quality of evidence for interventions was performed.¹⁴

Summary

It is important to note that evidence to support effectiveness of conservative treatment, surgical treatment or the potential benefit of one over the other remains limited. Until such evidence becomes available from ongoing trials, clinical and shared decision-making on the available interventions based on level of symptoms and functional restriction is recommended.

- It is not known whether topical nonsteroidal anti-inflammatory drugs (NSAIDs), oral corticosteroids, oral paracetamol or opioid analgesics improve shoulder pain, although oral NSAIDs may be effective in the short term in people with acute tendonitis/subacromial bursitis. If pain control fails, the diagnosis should be reviewed and other interventions considered.
- It is not known whether autologous blood injections, intra-articular NSAID injections, subacromial corticosteroid injections, electrical stimulation, ice or US are effective (there is an evidence gap here for corticosteroid injections and a large community based pragmatic NIHR trial should be considered).
- Acupuncture may not improve pain or function in people with rotator cuff impingement compared with placebo or US.
- Extracorporeal shock wave therapy may improve pain in calcific tendonitis.
- Physiotherapy may improve pain and function in people with mixed shoulder disorders compared with placebo.
- There is some evidence that suprascapular nerve block, laser treatment, arthroscopic subacromial decompression and rotator cuff repair, may be effective in patients with shoulder pain.
- Further evidence is needed on whether platelet-rich injections improve speed of recovery in terms of pain and function in people having subacromial decompression for rotator cuff impingement.

ORAL DRUG TREATMENT

Likely to be beneficial

- NSAIDs (oral) reduce pain in people with acute tendonitis and bursitis.

Unknown effectiveness

- Oral corticosteroids, opioid analgesics and paracetamol.

TOPICAL DRUG TREATMENT

Unknown effectiveness

- NSAIDs (topical).

LOCAL INJECTIONS

Likely to be beneficial

- Nerve block.

Unknown effectiveness

- Autologous blood injections.
- Platelet-rich plasma injections (results of PAROT; due 2015).
- Subacromial corticosteroid injections (evidence gap for this high volume treatment – recommend NIHR consider funding research).

NON-DRUG TREATMENT

Likely to be beneficial

- Extracorporeal shock wave therapy for calcific tendonitis.
- Laser treatment.
- Physiotherapy (manual treatment, exercises).

Unknown effectiveness

- Acupuncture.
- Electrical stimulation.
- Ice\US.

SURGERY.

Likely to be beneficial

- Arthroscopic subacromial decompression (ARUK funded multicentre CSAW trial underway).
- Rotator cuff repair (NIHR funded UKUFF multicentre trial – Results pending 2015).

Additional evidence regarding the effectiveness of surgery

- Reports of the outcome of such surgery are conflicting and evidence for effectiveness is unclear.^{15–17} An assessment of the cost of treatment of impingement suggests that the addition of surgery, in comparison to exercise treatment alone, is not cost-effective.¹⁸
- The management of partial tears is particularly controversial and patients with such tears have commonly been treated conservatively. Favourable results have been reported after debridement of partial tears in association with subacromial decompression.¹⁹
- Partial tears are most commonly managed without repair but some studies advocate repair to prevent progression to full-thickness tears. The evidence supporting this approach is weak.¹²
- Higher rates of re-rupture are associated with repairs of larger tears, increased patient age and increased fatty degeneration of the cuff muscles.^{20–23}
- There is conflicting evidence regarding the effectiveness of open or arthroscopic repair.^{14,24–26}
- There is also uncertainty regarding the relative value of conservative care, repair surgery and debridement surgery for large and massive tears.^{27–30}
- High failure rates of 13–68% have been reported for surgical repair of rotator cuff tears, irrespective of the surgical technique employed.^{31–33} Some studies have suggested that re-rupture rates are associated with poorer outcomes.^{21,22}
- Surgical decision-making in the management of rotator cuff tears was reviewed by Dunn et al.³⁴ They surveyed surgeons in the USA and found considerable variation in decision-making. This included the type of surgery, the surgical techniques employed and the type and duration of conservative treatment, including cortisone injections, physiotherapy, rest, analgesia and home exercises.
- Rates of medical visits for rotator cuff pathology in the USA were reviewed between 1996 and 2006. The volume of rotator cuff repairs had increased by 141% and the unadjusted number of arthroscopic repairs increased by 600% compared to a 34% increase in open repairs.³⁵
- The volume of arthroscopic subacromial decompression has also increased significantly over time. Recent figures from the USA report a 254% increase (from 30.0 to 101.9 per 100,000 people per year) in use of the procedure in New York State between 1996 and 2006. This compares to a 78.3% increase in ambulatory orthopaedic surgery overall.³⁶
- Observational studies of subacromial decompression surgery show positive results in terms of pain reduction and functional outcome with high patient

satisfaction rates.^{37–40} Good outcomes have also been noted in two studies following patients who had arthroscopic rotator cuff debridement or open rotator cuff repair in the absence of a subacromial decompression.^{41–42}

- Some comparative studies of subacromial decompression versus non-operative treatment options, such as physiotherapy, have not shown any significant difference in outcome between the two treatment modalities.^{16–18}
- There are a growing number of studies that have attempted to assess the effectiveness of subacromial decompression with a rotator cuff repair against a control. Two studies randomized patients undergoing rotator cuff repair to groups including or excluding subacromial decompression in their operative treatment; neither demonstrated any difference in outcome between the groups.^{41,43}
- A randomized controlled trial of subacromial decompression plus subacromial bursectomy versus bursectomy alone reported no significant difference in clinical outcome between the two groups.⁴⁴

Acknowledgements

Contributions from the BESS Working Group: Rohit Kulkarni, Andrew Carr and Jonathan Rees, Julie McBirnie, Peter Brownson, Cormac Kelly, Amar Rangan, Michael Thomas and Graham Titherleigh-Strong. Contributions from the BOA Guidance Development Group: Rohit Kulkarni (Chair), Joe Dias, Jonathan Rees, Andrew Carr, Chris Deighton, Vipul Patel, Federico Moscogiuri, Jo Gibson, Tim Holt, Chris Newsome, Mark Worthing and James Beyer.

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