



**Health  
Information  
and Quality  
Authority**

An tÚdarás Um Fhaisnéis  
agus Cáilíocht Sláinte

# **Health Technology Assessment of Scheduled Procedures**

## **Shoulder arthroscopy**

**July 2014**

*Safer Better Care*



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## Table of contents

<b>ABOUT THE HEALTH INFORMATION AND QUALITY AUTHORITY .....</b>	<b>3</b>
<b>1 SHOULDER ARTHROSCOPY .....</b>	<b>6</b>
1.1 Scope of HTA .....	6
1.2 Surgical indications .....	6
1.3 Surgical procedures, potential complications and alternative treatments ...	8
1.4 Current practice in Ireland.....	9
<b>2 CLINICAL REFERRAL/TREATMENT THRESHOLD .....</b>	<b>14</b>
2.1 Review of the literature .....	14
2.2 Clinical evidence.....	14
2.3 Cost-effectiveness evidence .....	20
2.4 Budget impact and resource implications .....	22
<b>3 ADVICE ON CLINICAL REFERRAL OR TREATMENT THRESHOLD .....</b>	<b>23</b>
<b>4 DISCUSSION.....</b>	<b>26</b>
<b>5 REFERENCES.....</b>	<b>28</b>
<b>APPENDICES .....</b>	<b>33</b>
Appendix 1.1 – HIPE ICD-10AM/ACHI list of intervention codes for shoulder arthroscopy procedures.....	33
Appendix 1.2 – Key points from systematic reviews and consensus statements on management of shoulder pathology .....	34
Appendix 1.3 – UK Examples of Referral Thresholds for Shoulder Arthroscopy ..	38

# 1 Shoulder arthroscopy

## 1.1 Scope of HTA

This health technology assessment (HTA) evaluates the appropriateness and potential impact of introducing clinical referral or treatment thresholds for shoulder arthroscopy for adults within the publicly-funded healthcare system in Ireland. The effectiveness of this surgery may be limited unless undertaken within strict clinical criteria. This report is one of a series of HTAs of scheduled procedures. Details of the background to the request and general methodology are provided in the separate 'Background and Methods' document.<sup>(1)</sup>

The scope of this HTA is to investigate clinical referral and treatment thresholds that can be used in the assessment, referral and surgical management of adults who are potential candidates for shoulder arthroscopy, in Ireland. Inputs from an expert advisory group along with a review of the clinical and cost-effectiveness literature were used to inform the criteria. Additionally, the budget impact and resource implications were assessed, as appropriate.

## 1.2 Surgical indications

Shoulder arthroscopy is an operative technique which facilitates visualisation of structures within the shoulder joint using a variety of fibre-optic telescopes, with images relayed to a screen. It may be performed in the day case or inpatient setting, and may be employed for diagnostic and or treatment purposes.

The shoulder (glenohumeral) joint consists of a ball and socket articulation between the relatively large humeral head and the relatively small and shallow glenoid fossa (part of the scapula), although the latter is deepened somewhat by the cartilaginous glenoid labrum. The stability of the shoulder joint is primarily determined by the surrounding musculature, namely the rotator cuff (a group of four 'short' shoulder muscles – supraspinatus, infraspinatus, teres minor and subscapularis), the long head of biceps and the 'long' muscles of the shoulder.<sup>(2)</sup> Above the shoulder joint lie the acromioclavicular joint – the point of articulation between the clavicle and the acromion process of the scapula – while the joint between the medial end of the clavicle and the sternum is called the sternoclavicular joint. Movement at each of these three joints, together with that of the scapulothoracic articulation, is interrelated, and hence the complex as a whole is termed the 'shoulder girdle'.

The four most common causes of shoulder pain and disability in primary care are rotator cuff disorders (rotator cuff tendinopathy, impingement, subacromial bursitis, rotator cuff tears), glenohumeral disorders (capsulitis ['frozen shoulder'], arthritis)

acromioclavicular joint disease, and referred neck pain.<sup>(3)</sup> It has been reported that up to 77% of patients with shoulder pathology have more than one diagnosis.<sup>(4)</sup> The shoulder joint is the most mobile joint in the body and, as a result, it is particularly susceptible to dislocation, particularly anteriorly, with the majority of events secondary to trauma, usually sports-associated, in the first instance.<sup>(5)</sup> Humeral dislocation can lead to detachment of the labrum from the glenoid, with different injury mechanisms associated with different forms of labral pathology; an anterior labral tear is termed a Bankart lesion, while a superior tear is given the term superior labrum anterior and posterior (SLAP) lesion. It has been demonstrated that approximately 56% of patients who suffer anterior dislocation will suffer recurrent instability within two years when managed conservatively,<sup>(6)</sup> and this is particularly the case for young, active males.

It has been suggested musculoskeletal problems account for approximately 17.5% of the workload in Irish general practice.<sup>(7)</sup> Separately, a study of 600 Irish farmers reported that 56% had experienced some form of MSK disorder in the previous year, with neck or shoulder pain accounting for 25% of symptoms.<sup>(8)</sup> International evidence suggests that shoulder pain is the third most common musculoskeletal cause of consultation in primary care.<sup>(9)</sup> A 1993 study of intrinsic shoulder disorders, presenting to Dutch primary care services, meanwhile, calculated a cumulative incidence of 14.7 per 1,000 patient years; rotator cuff tendinitis (29% of all incident cases) was the diagnosis most frequently recorded.<sup>(10)</sup> The overall annual prevalence and incidence of shoulder problems in adults who consulted primary care in the UK in 2000 have been estimated at 2.36% and 1.47%, respectively, with rates increasing linearly with age. During the three years following initial presentation around 22% of patients were referred to secondary care, with approximately 6% referred for specialist opinion.<sup>(11)</sup>

An estimated 272,148 (95% confidence interval (CI) = 218,994, 325,302) and 257,541 (95% CI = 185,268, 329,814) patients underwent rotator cuff repair and shoulder arthroscopy (excluding rotator cuff tears), respectively, in the day case setting, in the United States in 2006. The primary diagnoses necessitating arthroscopy (excluding rotator cuff tears) were impingement syndrome or periarthritis (34%), and instability or SLAP lesions (13%).<sup>(12)</sup> There has been a concomitant decrease in open surgery as use of arthroscopic techniques has gained popularity – an analysis of the American Board of Orthopaedic Surgery Database demonstrated that in 2004, 58.3% of all subacromial decompressions and or rotator cuff repairs were performed arthroscopically. The rate increased annually and by 2009 this number had risen to 83.7%.<sup>(13)</sup> Examination of temporal trends for subacromial decompression in England, meanwhile, has demonstrated that the number of procedures rose by 746%, from 2,523 patients in 2000/2001 (5.2 per

100,000) to 21,355 in 2009/2010 (40.2 per 100,000).<sup>(14)</sup> The numbers of patients receiving both subacromial decompression and rotator cuff repair remained low up until the year 2004 to 2005, after which point they increased substantially from 713 (1.4 per 100,000) to 7,330 procedures (13.7 per 100,000) in the year 2009 to 2010. Finally, operations for rotator cuff repair alone peaked in the year 2008 to 2009 at 2,468 (4.7 per 100,000) and then declined considerably in the year 2009 to 2010 to 1,399 (2.6 per 100,000 [95% CI 2.5 to 2.7]). This rate continued to fall in the year 2010 to 2011 to 1,308 procedures (2.4 per 100,000) and to 1,110 procedures (2.0 per 100,000) in the year 2011 to 2012.<sup>(14)</sup>

### **1.3 Surgical procedures, potential complications and alternative treatments**

Shoulder arthroscopy may be undertaken for either diagnostic or treatment purposes. In the case of the latter, the indications are continually expanding – the glenohumeral joint, subacromial space, acromioclavicular joint and scapulothoracic articulation are all accessible to the arthroscope, as is the case for adjacent neurovascular structures (that is, axillary nerve, suprascapular nerve, and brachial plexus).<sup>(15)</sup> Specific disease entities amenable to arthroscopic treatment include rotator cuff disease or impingement, shoulder instability, glenohumeral and acromioclavicular degenerative joint disease, adhesive capsulitis, biceps tendon and labral pathology, infection, and loose bodies<sup>(16)</sup>, with the specific procedure dependent on the underlying diagnosis. The procedure is generally performed using general anaesthesia, a local interscalene block, or a combination of both.<sup>(17)</sup>

Data from the National Surgical Quality Improvement Programme (NSQIP) in the United States, which examined outcomes in 9,410 cases of elective shoulder arthroscopy performed between 2005 and 2011, suggests a complication rate at 30 days of 0.99%; major morbidity was 0.54%, which included mortality in four cases (0.04%); and minor morbidity was 0.44%. Complications included return to the operating room (0.31%), superficial surgical site infections (0.16%), deep infections (0.01%), deep venous thrombosis or thrombophlebitis (0.09%), and pulmonary embolism (0.06%).<sup>(18)</sup> In the case of arthroscopic surgery for instability, studies have noted patient-reported recurrence rates of between 10% and 23%.<sup>(5;19;20)</sup>

The complexity and range of diagnoses involving the shoulder joint has led to a multitude of diagnostic and treatment algorithms being proposed in the literature. From a diagnostic standpoint, the options open to the clinician, following clinical history and examination, include plain films, shoulder ultrasound, magnetic resonance imaging (MRI) and arthrography (injection of gadolinium dye directly into the joint), computed tomography (CT), examination under anaesthesia (EUA) and shoulder arthroscopy.<sup>(21)</sup> In general terms, and in the absence of red-flag indicators –



which will be outlined in Section 2 of this report – a holistic approach to treatment is advocated, with potential alternative treatment strategies suggested in the literature including shoulder rest, physiotherapy, occupational therapy, acupuncture, analgesia and corticosteroid injections.<sup>(3)</sup> The option of open surgery exists for many of the shoulder pathologies now treated arthroscopically. An assessment of the relative merits of the various surgical approaches is beyond the scope of this HTA.

#### **1.4 Current practice in Ireland**

Potential candidates for shoulder arthroscopy are generally referred by their general practitioner (GP) or by another hospital specialist to an orthopaedic surgeon. Referral or treatment thresholds (similar to those discussed in Section 2 below) may be used by GPs and surgeons in Ireland to identify eligible candidates for referral or treatment. However, it is unclear if such thresholds are being used, or how consistently they are being applied.

Shoulder arthroscopy is a routine, scheduled surgical procedure within the publicly-funded healthcare system in Ireland. The Hospital In-Patient Enquiry (HIPE) system was employed to assess activity levels in relation to shoulder arthroscopy. Shoulder arthroscopy may be coded as the principal procedure or as a secondary procedure. For consistency and completeness, data is reported to include the principal and secondary procedures (that is, 'all procedures') with all data presented on this basis. The International Classification of Diseases (ICD) intervention codes used to retrieve this data is listed in Appendix 1.1.

The HIPE system reports that there were approximately 830 patients who underwent arthroscopic examination of their shoulder in 2012. Of these, 794 (95.7%) patients were admitted for their procedure on an elective basis; 31 (3.7%) were admitted on an emergency basis, with the remaining five (0.6%) patients being elective readmissions.

This data captures procedures provided as hospital day case and inpatient procedures, as in the other HTA reports in this series. Of the 794 procedures carried out in the pure elective (planned surgery) setting, 244 (30.7%) were performed on a day case basis; the National Clinical Programme in Surgery has identified a day case target of 95% for arthroscopic decompression of the subacromial space, the only arthroscopic shoulder procedure for which a target has been defined.<sup>(22)</sup> A total of 550 (69.3%) procedures necessitated an inpatient stay, with an average length of stay (ALOS) of 1.5 days; the average length of stay for patients undergoing shoulder arthroscopy in public hospitals decreased from 2.7 days in 2005 to 1.5 days in 2012 (Figure 1.1 on page 12). The average age of patients undergoing elective shoulder arthroscopy in 2012 was 49.2 years.

In 2012, the most common procedures were 'arthroscopic decompression of the subacromial space' (38.0%), 'arthroscopic reconstruction of the shoulder' (30.0%), arthroscopy (11.8%) and 'arthroscopic stabilisation of the shoulder' (11.5%).

All patients who undergo a surgical procedure in Irish public hospitals have an operative diagnosis coded as part of the HIPE coding process; this is recorded as the principal diagnosis at the time of operation, and may not be synonymous with the preoperative diagnosis. In 2012, the principal diagnosis – at the time of the shoulder arthroscopy – was coded as 'shoulder lesions' in 57.6%; the next most frequently coded diagnoses were 'other joint disorders, not elsewhere specified' (21.3%), 'other joint derangements' (14.4%), 'other arthrosis' (3.0%) and miscellaneous (3.8%).

The 794 elective shoulder arthroscopies recorded within the HIPE system in 2012 were performed across 19 different hospital sites (range 1 – 192 per hospital site); seven hospitals performed 10 or fewer procedures over the year. These institutions are categorised according to their hospital groups in Table 1.1 on the following page. Variation in the percentage of procedures carried out as day cases is noted, ranging from 0% in the Health Service Executive (HSE) Midwest to 81.8% in HSE Dublin North East. It should be noted that any variation may be explained by differing catchment sizes or the availability of an orthopaedic surgery service, hospital size or specialisation. It should also be noted that patient comorbidity may occasionally mandate that shoulder arthroscopy is performed in a tertiary-level institution in which this procedure is not normally undertaken.

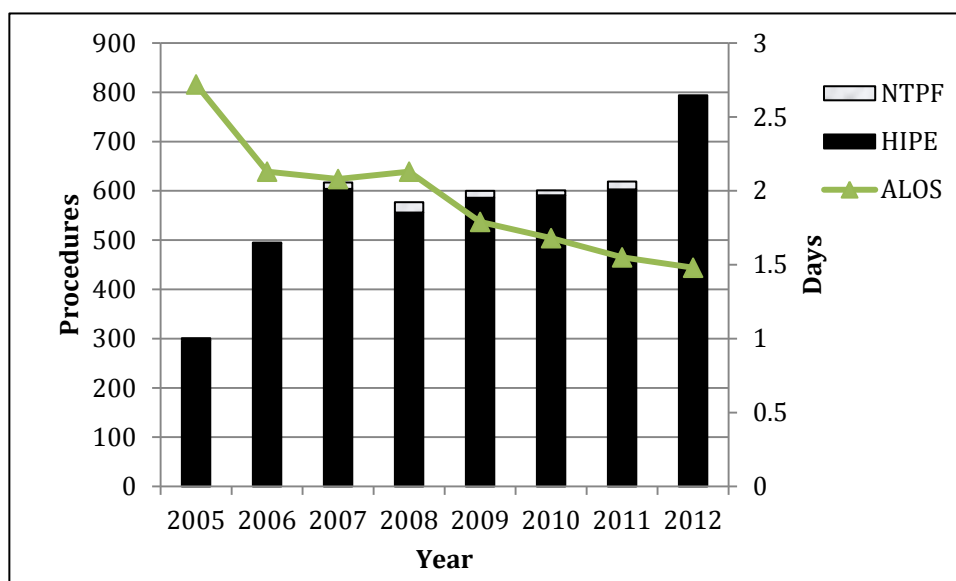
**Table 1.1. HIPE data per proposed HSE hospital group\* (2012)<sup>(23)</sup>**

Hospital group	Number (range)	ALOS (days)	% day cases	Inpatient bed days	Average age
	(% Total)				(years)
Dublin North East	66 (1-64) (8.3%)	1.4	81.8	17	52.3
Dublin Midlands	117 (33-57) (14.7%)	1.5	29.9	120	49.4
Dublin East	254 (3-192) (32.0%)	1.6	23.2	316	47.3
South/South West	212 (3-145) (26.7%)	1.1	66.6	133	47.3
West/North West	87 (1-58) (11.0%)	1.5	4.6	121	54.1
Midwest	57 (57) (7.2%)	1.8	0	104	53.3
Acute paediatric services, Dublin	<5	-	-	-	-
Total	794	1.5	30.7	814	49.2

*Key: Range – the range in terms of number of procedures performed in individual institutions within the hospital group. ALOS – average length of stay for inpatients. \*See Appendix 1.1 for HIPE codes; HIPE data includes all activity in publicly-funded hospitals, including procedures in patients that used private health insurance.*

In addition to the activity levels in public hospitals, additional procedures have been funded by the public healthcare system via the National Treatment Purchase Fund (NTPF). Between 2005 and 2012, an additional 80 procedures were procured from the private hospitals, although no procedures were funded in 2012. Data on the total number of procedures undertaken in the publicly-funded system, including the additional procedures funded by the NTPF, is shown in Figure 1.1. The number of elective shoulder arthroscopies undertaken in the publicly-funded healthcare system has increased by approximately 164% in recent years from 301 in 2005 to 794 in 2012. The number of open shoulder procedures performed annually remained stable over the same time period.

**Figure 1.1. Number and average length of stay (days) for elective shoulder arthroscopies provided through the publicly-funded healthcare system in Ireland, 2005-2012<sup>(23)</sup>**



*Key: HIPE (Hospital In-Patient Enquiry Scheme) data; NTPF (National Treatment Purchase Fund) funded procedures. HIPE data includes all activity in publicly funded hospitals, including procedures in patients that used private health insurance. ALOS - average length of stay for inpatients (days).*

The length of time a patient must wait to be reviewed varies according to the referral pathway and the individual hospital and consultant to which a patient is referred. At the end of April 2014, it was reported that there were 338,943 patients on the outpatient waiting list database collated by the NTPF, 34.2% of whom were waiting longer than six months, with 6.7% on the list for longer than 12 months. Orthopaedic referrals constituted 12.4% (n=41,975) of the total waiting list; 42% of these patients had been waiting greater than six months for an outpatient appointment in secondary care.<sup>(24)</sup>

Initiatives are underway by the HSE to standardise the management of outpatient services and to ensure that there are consistent management processes across all publicly-funded healthcare facilities that provide outpatient services. This includes the publication of a protocol for the management of these services by the NTPF in January 2013 which provides the core guidance of the Outpatient Services Performance Improvement Programme.<sup>(25)</sup> The protocol specifies that patients should be treated based on clinical urgency, with urgent referrals seen and treated first. It is intended by the HSE that the definition of clinical urgency and associated maximum

wait times is to be developed at speciality or condition level and agreed by the clinical programmes.

In January 2013, the NTPF published a national waiting list management policy that outlines the standardised approach to managing scheduled care treatment for inpatient, day case and planned procedures in all publicly-funded hospitals.<sup>(26)</sup> It outlines a consistent structured approach that must be adopted to the management of the waiting list. Monitoring of the implementation of the policy will be routinely undertaken by the NTPF in the form of annual quality assurance reviews.

In relation to orthopaedic procedures specifically, it should be noted that a combined initiative, aimed at reducing waiting lists for outpatient appointments, was launched by the National Orthopaedic and Rheumatology Clinical Programmes in 2010. Under this initiative, 24 clinical specialist musculoskeletal physiotherapists were employed across Ireland (six per region) to work alongside orthopaedic and rheumatology consultants, with these consultants performing the initial triage based on the referral letter. The process aimed to identify patients for whom conservative management may be a more appropriate treatment.

An audit of practice, between January and July 2012, at St Vincent's University Hospital (SVUH) in Dublin has reported that of 763 patients allocated an appointment under this system, 49 (6%) did not attend or cancelled their appointment. At the time of the audit, 140 (20%) patients were awaiting review with the MSK team as return patients (for example, for follow-up after medical investigations). Of the remaining 574 patients, whose outcome was known, 76% were independently managed by the MSK physiotherapists without need for orthopaedic consultation; 39% of whom were discharged to physiotherapy (63% within SVUH and 37% to a primary care service) and 37% back to their general practitioner. Twenty four percent of patients (n=137) were referred on to a surgical or medical specialty, 92% (n=126) of those for an orthopaedic surgical opinion, 4% to the department of pain medicine, 1% to rheumatology and 2% to another specialty (for example, neurology, vascular surgery).<sup>(27)</sup>

In primary care, meanwhile, 175,926 referrals were made to physiotherapy services in 2013; this was 2.1% above expected activity for the year.<sup>(28)</sup> Overall activity levels were also 1.9% higher than expected, with 733,613 physiotherapy treatment episodes provided in 2013. This included 145,213 patients who were referred for first-time assessments (an increase of 4.4% above expected activity).<sup>(28)</sup> Despite increased activity levels, demand continues to exceed available capacity. At the end of April 2014, there were 6,377 patients waiting over 12 weeks for a physiotherapy assessment in primary care.<sup>(29)</sup>

## 2 Clinical referral/treatment threshold

### 2.1 Review of the literature

A comprehensive review of the literature was conducted during March 2014 to identify international clinical guidelines, health policy documents describing treatment thresholds that are in place in other healthcare systems, as well as systematic reviews and economic evaluations examining the effect of the introduction of those thresholds. The approach and general search terms are described in Appendix 1 in the 'Background and Methods' document; a summary of the results is included in Table 2.1. A summary of the clinical guidelines identified from the search and thresholds in use elsewhere are provided in Appendices 1.2 and 1.3, respectively.

**Table 2.1. Included evidence sources to inform clinical referral thresholds**

Publication Type	Number	References
Clinical guideline	7	(30-36)
Systematic review	10	(37-46)
Cost-effectiveness studies	8	(44;47-53)

### 2.2 Clinical evidence

As noted in Section 1.2, the rotator cuff (a group of four 'short' shoulder muscles – supraspinatus, infraspinatus, teres minor and subscapularis) contributes significantly to the stability of the shoulder joint. Above the shoulder joint lie the acromioclavicular joint, at the junction of the acromion process of the scapula and the lateral end of the clavicle. The space between the shoulder and acromioclavicular joints is termed the subacromial space; this contains the rotator cuff and pain can occur here as a result of impingement of the acromioclavicular joint on the rotator cuff. In addition, the tendons of the rotator cuff may be intact or torn, the latter occurring either chronically as a result of degeneration or acutely due to trauma. Surgical options include open or arthroscopic approaches, with specific procedures including acromioplasty (removing the under surface of the antero-lateral aspect of the acromion) and repair of the rotator cuff. In order to facilitate review, the evidence presented here is categorised by pathological subtype.

## **Rotator cuff pathology and subacromial shoulder pain**

The International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS) Upper Extremity Committee (UEC) published the proceedings of its 2012 Consensus Meeting in 2013.<sup>(30)</sup> This noted that overall surgical indications for isolated acromioplasty have steadily decreased because of the implementation of refined clinical examination and the use of reliable non-invasive imaging studies. There was consensus that non-operative management of impingement is effective in the vast majority of cases and that, where indicated, acromioplasty should be preceded by a three-month rehabilitation programme (Appendix 1.2). Specific indications for acromioplasty included lateral pain aggravated by night pain, a positive impingement sign, and, or a painful arc of movement. A Cochrane review by Coghlan et al. in 2008, meanwhile, attempted to determine the evidence for the safety and effectiveness of surgery for impingement.<sup>(37)</sup> Three trials compared either open or arthroscopic subacromial decompression with active non-operative treatment (exercise programme, physiotherapy regimen of exercise and education, or graded physiotherapy strengthening programme); no differences in outcome between these treatment groups were reported in any of the trials ('silver' level evidence). These findings were also reflected in a 2008 systematic review of the same randomised controlled trials (RCTs), plus one other, by Dorrestijn et al..<sup>(38)</sup>

In relation to management of rotator cuff tears, meanwhile, the ISAKOS Consensus stated that "most asymptomatic tears responded to non-operative protocols and remained asymptomatic at two years". Beaudreuil et al., meanwhile, in their consensus guidelines, based on a systematic review of the literature, published on behalf of the French Ministry for Health in 2009 suggested that medical treatment is always the first option in the management of degenerative tears of the rotator cuff.<sup>(31)</sup> Indeed, there has been some debate as to the appropriateness of operative intervention at all, with the Agency for Healthcare Research and Quality (ARHQ) in the United States concluding in 2010 that the evidence is too limited to make conclusions regarding the comparative effectiveness of conservative versus operative intervention for rotator cuff tears; this was based on a systematic review up to 2009, that included five studies with a median sample size of 103 (IQR 40-108).<sup>(39)</sup>

The American Association of Orthopaedic Surgeons (AAOS) published its clinical guidelines on the management of rotator cuff disorders in 2010.<sup>(32)</sup> In total, 14 recommendations were made (Appendix 1.2), including that rotator cuff tears should not be repaired if asymptomatic and that routine acromioplasty is not required at the time of rotator cuff repair. This latter finding was supported by the results of a systematic review published by Chalal et al. in 2012 which looked specifically for trials that compared outcomes for patients who undergo rotator cuff repair alone



versus those who undergo repair plus acromioplasty. Based on the results of four randomised controlled trials with 373 participants, the authors concluded that there was no significant difference in disease-specific quality of life, shoulder-specific outcome measures or rates of reoperation up to two years postoperatively.<sup>(40)</sup>

In 2013, the University of New South Wales published its 'Clinical Practice Guidelines for the Management of Rotator Cuff Syndrome in the Workplace', based on a working party systematic review of the literature.<sup>(33)</sup> This states that clinicians should refer for specialist opinion if an injured worker experiences significant activity limitation and participation restrictions and or persistent pain following engagement in an active, non-surgical treatment programme for three months. In relation to rotator cuff tears, the authors state that referral should be made if there is a symptomatic, established small or medium full-thickness tear or if there is a symptomatic, full-thickness rotator cuff tear greater than three centimetres.

Primary care trusts (PCTs) in the English NHS used this evolving evidence base to construct referral and treatment thresholds for patients with rotator cuff pathology or impingement. As part of the changes to the NHS brought about by the Health and Social Care Act 2012, PCTs and strategic health authorities (SHAs) ceased to exist on 31 March 2013. Their responsibilities were taken over by clinical commissioning groups and the NHS Trust Development Authority. However, the thresholds that were previously developed by these trusts are likely to represent ongoing practice at a local level while new commissioning guides are being established. An example of specific thresholds for shoulder arthroscopy from one NHS PCT area is provided in Appendix 1.3.

The Clinical Commissioning Group with responsibility for subacromial shoulder pain in the UK is currently drawing up its recommendations.<sup>(34)</sup> This document is sponsored by the British Elbow and Shoulder Surgery Society (BESS), the British Orthopaedic Association (BOA) and the Royal College of Surgeons of England (RCSEng), and the process used to produce the recommendations has been accredited by NICE. It is noted that at the time of publication of this HTA, the commissioning guide was still in 'draft' form and the final report had not yet been issued. Based on a systematic review of the literature and discussion with an expert advisory group, a number of draft recommendations had been proposed (Appendix 1.3). The guideline states that surgery is indicated for persistent or significant pain and loss of function despite comprehensive non-operative treatment. Specifically in relation to acromioplasty, the guideline states that it should be considered in those with:

- impingement pain in the absence of a rotator cuff tear
- impingement pain with an unrepairable rotator cuff tear



- failure of appropriate conservative management.

Meanwhile, in relation to tears of the rotator cuff, the guideline suggests that repair should be considered for those with:

- acute (traumatic or degenerative) rotator cuff tear
- persistent subacromial shoulder pain and weakness with ultrasound or magnetic resonance imaging (MRI) findings indicating a full thickness rotator cuff tear after adequate and appropriate conservative treatment.

Published evidence and international guidelines thus suggest that isolated subacromial decompression should only be undertaken in limited circumstances, and only following at least three months of conservative treatment. While rotator cuff repair is advocated in the acute setting, it should not be considered in the chronic setting in the absence of a prior period of conservative management. Tears should not be repaired if asymptomatic.

### **Shoulder instability**

ISAKOS published its consensus statement on shoulder instability in 2010, based on a 2008 meeting of its UEC (Appendix 1.2).<sup>(35)</sup> The authors noted that the history and physical findings are critical in the surgical versus non-surgical decision-making process, and that instability tests in the anaesthetised patient can add to the overall assessment of instability. Specifically in relation to primary (first-time) dislocations, the authors noted that surgical treatment remains controversial, although recent level-one studies (i.e. includes evidence from at least one RCT) with medium- to long-term follow-up have found advantages of surgical treatment in the young active population. In relation to recurrent dislocation, meanwhile, the authors noted that success of rehabilitation is highest in multidirectional instability (MDI) and athletes with micro-instability or disabled throwing shoulder, and that rehabilitation is less successful in post-traumatic instability.

A number of Cochrane and systematic reviews comparing conservative and surgical approaches to the management of various forms of shoulder instability have been also been published, and their key conclusions are outlined in Table 2.2.

**Table 2.2 Systematic Reviews comparing conservative and operative intervention for shoulder dislocation.**

Tamaaki et al, 2010 <sup>(43)</sup>	Topic: Acromioclavicular Dislocation
Three studies, 174 participants. Cochrane review. Conclusions: there is insufficient evidence to determine when surgery is indicated.	
Brophy et al, 2009 <sup>(41)</sup>	Topic: Primary Anterior Shoulder Dislocation
Six studies, 113 participants. Systematic review. Conclusions: rates of recurrent instability after a first-time anterior shoulder dislocation, particularly in young active male patients, are reduced by surgical intervention compared to non-operative treatment.	
Handoll et al, 2004 <sup>(42)</sup>	Topic: Primary Anterior Shoulder Dislocation
Four studies, 163 participants. Cochrane review. Conclusions: subsequent instability, either redislocation or subluxation, was statistically significantly less frequent in the surgical group. Limited evidence supports primary surgery for young adults, usually male, engaged in highly demanding physical activities who have sustained their first acute traumatic shoulder dislocation. There is no evidence available to determine which treatment is better for other patient groups.	

On balance the evidence suggests that those with first-time anterior dislocations warrant referral for evaluation for surgical intervention.

### **Adhesive capsulitis or 'frozen shoulder'**

Maund et al. published their HTA entitled 'Management of frozen shoulder: a systematic review and cost-effectiveness analysis', on behalf of the UK's National Institute for Health Research (NIHR), in 2012.<sup>(44)</sup> The authors concluded that there was insufficient evidence to make any robust recommendations regarding manipulation under anaesthetic (MUA), arthroscopic capsular release or arthrographic distension, in the management of frozen shoulder. Noting that patients with diabetes are particularly susceptible to frozen shoulder, with an incidence of between 10% and 36%, and that these patients tend not to respond as well to treatment as those without diabetes, the authors attempted to examine variation between these two patient subgroups. Unfortunately, paucity of evidence meant that the authors could not come to any specific conclusions in relation to management of frozen shoulder in this patient cohort. A 2013 systematic review by Grant et al., meanwhile, compared MUA and arthroscopic release for patients with recalcitrant idiopathic capsulitis. The authors found no level 1, 2 or 3 evidence directly comparing the two procedures, leading the authors to conclude that there is no clear evidence of a difference in outcomes between groups.<sup>(45)</sup>

In relation to conservative management, meanwhile, Maund et al. stated that it “remains unclear, based on the research evidence available, what constitutes an optimal physiotherapy intervention in terms of the essential components, number and length of sessions and overall duration and the type of physiotherapy. It also remains unclear at what stage and severity of frozen shoulder such an intervention would be of greatest benefit and whether any effect is similar in people with and without diabetes”.<sup>(44)</sup>

An example of a UK PCT referral guideline for frozen shoulder is included in Appendix 1.3.

To summarise, there is no definitive evidence of a benefit from operative intervention for frozen shoulder, and conservative management in primary care is advocated with referral for secondary opinion in only the most intractable cases. Although good evidence is lacking in relation to optimal management strategies, it appears that patients with diabetes are more susceptible to frozen shoulder and tend to have worse outcomes, and thus clinicians should consider earlier referral for orthopaedic review in this patient cohort.

### **Glenohumeral joint osteoarthritis**

The AAOS published its guideline and evidence report on glenohumeral joint osteoarthritis in 2009.<sup>(36)</sup> This made 16 recommendations based on literature review. Specifically in relation to arthroscopy, the report states that the authors were:

unable to recommend for or against the use of arthroscopic treatments for patients with glenohumeral joint osteoarthritis. These treatments include debridement, capsular release, chondroplasty, microfracture, removal of loose bodies, and biologic and interpositional grafts, subacromial decompression, distal clavicle resection, acromioclavicular joint resection, biceps tenotomy or tenodesis, and labral repair or advancement.

The strength of the evidence leading to this assertion was ‘inconclusive’, however.

More recently, Namdari et al. published the results of their systematic review of arthroscopic debridement for glenohumeral arthritis.<sup>(46)</sup> The authors reported that they could find only level 4 (i.e. case series) type evidence to suggest improvements in pain relief and short-term patient satisfaction. They concluded that arthroscopic debridement in this setting lacks evidence to support its use.

An example of a UK PCT referral guideline for glenohumeral joint osteoarthritis is included in Appendix 1.3.

Once again, there is currently no definitive evidence of a benefit from operative intervention in the form of arthroscopy for those with glenohumeral joint osteoarthritis. Referral guidelines for those who may be candidates for arthroplasty would be helpful to complete the picture, but these are beyond the scope of this present work.

### **2.3 Cost-effectiveness evidence**

Eight economic evaluations (Finland = 2; UK = 4, US = 2) were retrieved that compared the relative cost, or cost-effectiveness, of shoulder arthroscopic procedures to non-operative management for a range of indications.

In 2010, Adla et al. calculated the costs of open versus arthroscopic rotator cuff repair.<sup>(47)</sup> Based on a 30-patient cohort, with 15 patients in each surgical category, and using 2004 to 2005 costs, the authors calculated that one arthroscopic repair cost £870 British pounds (£GBP).

In 2009, Ketola et al. published the results of their two-year RCT which examined costs and outcomes of exercise alone versus arthroscopic acromioplasty and postoperative exercise ('combined treatment'), for the management of impingement.<sup>(48)</sup> Based on a cohort of 140 patients, with 70 patients assigned to each group, the mean costs in euro were €2,961 and €1,864 per patient in the combined and exercise only groups, respectively (2004 prices). There were no differences, at 24 months, in mean self-reported pain on visual analogue scales, or in secondary outcome measures of disability, pain at night, shoulder disability questionnaire score, number of painful days, and proportion of pain-free patients. The authors recently published five-year follow-up data and, again, reported no differences between the two groups at this point in time. They concluded therefore that arthroscopic acromioplasty is not cost-effective for impingement syndrome, and that structured exercise appears to be the treatment of choice.<sup>(49)</sup>

Using a Markov model Mather et al. estimated the cost effectiveness of rotator cuff repair.<sup>(53)</sup> The authors took a societal perspective, and used 2013 costs in United States Dollars (USD\$); a 3% discount rate was applied. They reported that the lifetime age-weighted mean total societal savings per patient from open or arthroscopic rotator cuff repair was USD\$13,771 compared to non-operative treatment. The mean difference in QALYs between rotator cuff repair and non-operative treatment was 0.62; mean savings ranged from a positive USD\$77,662 for the youngest cohort of patients to a loss of USD\$11,997 for the oldest (seventy to seventy-nine years old). The lifetime QALYs were consistently higher for those who received surgical treatment in all age groups. Importantly, while these results

demonstrated the cost-effectiveness of surgical intervention, the authors noted that non-operative treatment is the preferred strategy for a large number of patients.

Robinson et al. compared costs for arthroscopic lavage of the shoulder joint versus arthroscopic lavage combined with repair of the anteroinferior labrum (Bankhart repair), in patients with first-time dislocation of their shoulder.<sup>(52)</sup> Based on 2005 to 2006 British pounds, and taking a payer perspective, the authors calculated total costs up to 24 months post-operatively. Lavage alone cost GBP£3,531.30 (GBP£3002.1 to £4060.5) whilst the combination of lavage and Bankhart repair cost GBP£2,782.40 (GBP£2,552.1 to £3,012.7). As noted by the authors, the reduced costs of treatment during the first two years after the dislocation offset the initial higher expenditure, and the overall cost of treatment was therefore significantly lower in the group that had arthroscopic lavage and Bankart repair ( $p=0.012$ ). For comparison, the costs of the procedures alone were GBP£2,088.60 for lavage alone and GBP£2,558.50 for the combined procedure. Crall et al., meanwhile, performed a cost-effectiveness analysis of non-operative treatment versus primary arthroscopic stabilisation using a simulated Markov Model.<sup>(50)</sup> Published in 2012, this study concluded that surgery was the dominant preferred strategy (less costly and more effective), resulting in average cost savings of \$2,894 United States Dollars (\$USD) and an increase of 0.95 quality adjusted life years (QALYs) per patient.

The aforementioned HTA by Maund et al. examined cost-effectiveness, in addition to the clinical effectiveness, of the management of frozen shoulder.<sup>(44)</sup> The authors estimated the cost of manipulation under anaesthetic (MUA) and arthroscopic capsular release (ACR) at GBP£1,446 and GBP£2,204, respectively. The authors concluded that there is insufficient evidence available to make conclusions about the effectiveness of treatments for frozen shoulder in terms of quality of life outcomes based on patient preference measures. In 2013, Datani et al. published their research on functional and health-related quality of life outcomes following arthroscopic capsular release (ACR) for frozen shoulder.<sup>(51)</sup> A total of 68 patients who had failed non-operative management underwent ACR alone, whilst a further 32 underwent ACR in combination with subacromial decompression. QALYs were calculated based on changes in the EuroQol questionnaire, and compared with costs as calculated from the payer's perspective. The median improvement in the EQ-5D index (QALYs gained) six months after ACR alone was 0.50 (standard deviation [SD] 0.32), generating a cost per QALY of GBP£2,563. The median improvement in the EQ-5D index (QALYs gained) following ACR with subacromial decompression was 0.64 (SD 0.26; IQR 0.36 to 0.81), generating a cost per QALY of £3,189, compared to non-operative management. In contrast to the HTA by Maund et al., this study concluded that both ACR alone and ACR with subacromial decompression were both

cost-effective procedures that led to restoration of function and health-related quality of life within six months of surgery.

To summarise, then, limited international evidence suggests that Bankhart repair of primary shoulder instability and surgical repair of rotator cuff tears may be cost-effective measures. The evidence, however, does not appear to support the use of arthroscopic acromioplasty in addressing shoulder impingement, while further studies are required to clarify the cost-effectiveness or otherwise of arthroscopy in the management of frozen shoulder and glenohumeral osteoarthritis. The relevance of this international literature to the current Irish healthcare setting is uncertain. As outlined in Section 2.3, the absence of definite evidence regarding the clinical effectiveness of operative intervention for a number of the indications examined leads to uncertainty regarding the potential cost-effectiveness of these procedures.

## **2.4 Budget impact and resource implications**

The number of shoulder arthroscopy procedures has more than doubled in Ireland since 2005, albeit from a low level volume-wise when compared to international rates. As noted in Section 1.4, 70% of the procedures were undertaken as inpatient cases in 2012. The current estimated annual national cost of shoulder arthroscopy procedures is €2.9 million, with an average weighted cost per procedure of €3,701, based on the latest Casemix costs (Table 2.3 on the following page). As noted in section 1.4, there is evidence of significant variation regarding day case rates between hospitals for shoulder arthroscopy procedures and it is suggested that analysis of the underlying factors would be useful in identifying how existing resources might be better utilised.

**Table 2.3. HSE inpatient and day case acute hospital activity and costs summarised by diagnosis-related group (based on 2011 costs and 2012 activity)**

DRG code	Description	Number carried out	Cost/inpatient (€)	Cost/day case (€)
I16Z	Other Shoulder Procedures	697	4,363	2,600
I24Z	Arthroscopy	80	3,440	1,214
I12C	Infect/Inflam of Bone and Joint W Misc Musculoskeletal Procs W/O CC	5	7402	1,481
	Other Procedures*	12		

*Key: DRG – diagnostic-related group; W – with; W/O – without; CC – complication or comorbidity.*

*Data summary from HSE National Casemix Programme Ready Reckoner 2013 based on the 2011 inpatient and day case costs reported by 38 hospitals participating in the programme that year. Activity is based on the latest 2012 HIPE data.*

*\*Note the remaining diagnosis-related groups accounted for four or fewer of the procedures each.*

### 3 Advice on clinical referral or treatment threshold

The evidence base regarding shoulder arthroscopy is still evolving. Taking account of the current available evidence that exists in relation to shoulder arthroscopy, the following threshold criteria are advised for referral and treatment within the publicly-funded healthcare system in Ireland:

These criteria are designed to distinguish between patients who would derive additional benefit from elective shoulder arthroscopy over conservative management in the primary care setting. Patients who present with 'red flag' signs or symptoms, suggestive of, for example dislocation, infection or malignancy, should continue to be referred for emergency or urgent assessment in secondary care.

All patients should have timely access to necessary radiological investigations, including MRI and ultrasound scanning where appropriate, via primary care services. Where conservative management is indicated, this should be made available to patients at a time when they are most likely to derive benefit from this management.

### **Rotator cuff pathology and subacromial shoulder pain**

- Early referral should be considered for patients suffering an acute tear of their rotator cuff.
- Optimal conservative management in primary care should be trialed in all other patients for at least three months.
- Referral for consideration for arthroscopic (or open) repair of a chronic tear of the rotator cuff should only be considered in patients following three months of optimal conservative management in the primary care setting
  - who are symptomatic AND
  - who are willing to consider surgery as a therapeutic option.
- Referral for consideration for acromioplasty (for patients with symptoms of impingement) should only be considered, in limited circumstances, in symptomatic patients in whom optimal conservative management in primary care has failed.

### **Shoulder instability**

- Those with first-time anterior dislocations warrant referral for an orthopaedic surgical opinion

### **Adhesive capsulitis or 'frozen shoulder'**

- All patients should have an X-ray to rule out osteoarthritis.
- Optimal conservative management in the primary care setting, including physiotherapy and image-guided joint injection where appropriate, is advocated for all patients.
- Referral for secondary opinion regarding surgical intervention should only be considered in the most intractable cases, where at least six months of conservative management has not resulted in symptom resolution.
- Consideration should be given to earlier referral for patients with diabetes.

### **Glenohumeral joint osteoarthritis**

- Patients who remain symptomatic and have associated disability, despite optimal conservative management in the community setting should be referred for a surgical opinion.



- Arthroscopic treatment may be appropriate in selected cases. Specific indications for shoulder arthroplasty are beyond the scope of this present work.

Patients who do not meet these criteria above should remain under the care of the general practitioner who will manage conservative treatment of the patient.

While the exact nature of what constitutes optimal conservative management is beyond the scope of this assessment, options may include pharmacological and non-pharmacological measures, physiotherapy, occupational therapy and/or advice in relation to activities of daily living. Where joint injection forms part of the management strategy, it should only be offered to patients with an appropriate clinical diagnosis and performed by those who are appropriately trained to do so. Imaging guidance is preferable where this is available in a timely fashion.

## **4 Discussion**

Referral thresholds have been developed based on a comprehensive review of the literature and international referral guidelines. While referral thresholds may currently be used on an informal, improvised, and or unplanned basis within the Irish system, this has not been done consistently. The need for standardisation in referral practices is driven by increasing pressure on the public healthcare system, and by the need to ensure consistency of clinical practice.

As noted, since 2005 the number of shoulder arthroscopies performed annually in Ireland has more than doubled. Whilst a large proportion of this increase may be attributed to evolution of the speciality, with an increasing number of cases now amenable to intervention using arthroscopic techniques, it nevertheless highlights the fact that demand for services is on the increase. In this context, it is recognised that the thresholds outlined above are unlikely to impact on the number of surgeries performed. Rather, in an area in which the evidence base is still evolving, it is intended that these thresholds will ensure that only those patients who are likely to derive additional benefit from surgical versus conservative management will be referred for a surgical opinion. This, in turn, should help to speed up access for those who do stand to benefit, while also helping to manage patient expectation and ensuring that the appropriate resources are directed towards those who should receive conservative care.

One caveat to the effective implementation of referral thresholds in Ireland is the limited access to conservative treatment in the primary care setting. The provision of specialist musculoskeletal (MSK) services through the Orthopaedic and Rheumatology Clinical Programmes has clearly impacted on waiting lists for outpatient appointments in secondary care. At present, however, access to these services remains via referral into the secondary care system, where patients are then triaged according to need. Implementation of an MSK programme to support general practitioners and community physiotherapists in the primary care setting may provide one solution to the need for increased access to timely and appropriate conservative management in this setting. In addition, implementation of this threshold will require additional resources to be directed towards physiotherapists working in the primary care setting, such that patients can be assured access to a holistic, multidisciplinary programme of conservative management where appropriate.

A further caveat is that while the thresholds identified in this report suggest the need for optimal conservative management in the first instance, what constitutes optimal care remains open to question. Unfortunately, analysis of the related evidence base is beyond the scope of this present report.

It is noted that while development of this threshold should aid in defining who should be referred for arthroscopy, the mechanisms around its practical implementation remain to be fully clarified. It is clear that the National Healthlink Project, which permits the secure transmission of clinical patient information between GPs and hospitals, has facilitated improved communication of referrals between primary and secondary care. It is thus suggested that one mechanism through which this referral threshold might be implemented would be through its integration in the form of a standardised referral form into this project. Of note, initiatives are underway by the orthopaedic and rheumatology clinical care programmes in the Health Service Executive (HSE) to develop interface clinics and consultations between primary and secondary care services in Ireland and to implement agreed national referral guidelines for all patients with musculoskeletal disease. As these developments are realised, the threshold outlined above may require updating to reflect the changing roles of allied health practitioners within the context of these referral guidelines.

In conclusion, the thresholds outlined above are consistent with well established clinical guidelines and published evidence. Hence, they are unlikely to represent a major change from current practice, but rather a standardisation of referral and treatment criteria across all areas of the publicly-funded healthcare system. Consistent application of the criteria throughout the healthcare system through the use of stated thresholds that are integrated into agreed national referral guidelines should assist patient triage, bring greater transparency, ensure equity of access based on clinical need and allow maximum benefit to be gained from existing resources. Consistent with best practice, guidelines and thresholds should be updated as necessary to reflect changes in the evidence base. As with all thresholds, it is imperative that there are opportunities for appeal mechanisms to ensure good governance. In addition, while these thresholds represent best practice, their implementation will depend on timely access to both the full range of conservative treatment options and to radiology services, at the primary care level.

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## Appendices

### Appendix 1.1 – HIPE ICD-10AM/ACHI list of intervention codes for shoulder arthroscopy procedures

Intervention code	Description
48945-00	4894500 (Arthroscopy of shoulder).
48948-01	4894801 (Arthroscopic removal loose body shoulder).
90600-00	9060000 (Arthro release adhes/contract shoulder).
48945-01	4894501 (Arthroscopic biopsy of shoulder).
48948-00	4894800 (Arthroscopic debridement of shoulder).
48954-00	4895400 (Arthroscopic synovectomy of shoulder).
48951-00	4895100 (Arthro decomp subacrom space).
48957-00	4895700 (Arthroscopic stabilisation of shoulder).
48948-02	4894802 (Arthroscopic chondroplasty of shoulder).
48960-00	4896000 (Arthroscopic reconstruction of shoulder).

## Appendix 1.2 – Key points from systematic reviews and consensus statements on management of shoulder pathology

### ISAKOS, 2013<sup>(30)</sup>

#### Key points

##### Acromioplasty

Non-operative management of impingement is effective in the vast majority of cases, however, acromioplasty is indicated if a patient complains of lateral pain aggravated by night pain, has a positive impingement sign, and has a painful arc with no improvement on the scapular assistance test and scapular retraction test. This procedure is best indicated in patients who do not benefit from a three-month rehabilitation programme. Typically, shoulder impingement can be managed non-operatively because no statistical difference exists between rotator cuff healing rates with and without acromioplasty. However, the re-tear rate is decreased when the surgery is performed at the index repair.

##### Coracoid impingement

Signs and symptoms of coracoid impingement include crepitus and pain on examination. It should be non-surgically managed for the first three to six months. Coracoid decompression should only be completed after failure of conservative measures in addition to a positive injection sign.

##### Rotator cuff tears

Most asymptomatic tears responded to non-operative protocols and remained asymptomatic at two years. Partial tears with greater than 50% involvement should undergo repair, whereas smaller tears can be managed conservatively with physical therapy and activity modification.

### Guideline: AAOS, 2010<sup>(32)</sup>

In the absence of reliable evidence, it is the opinion of the work group that surgery not be performed for asymptomatic full-thickness rotator cuff tears.

Rotator cuff repair is an option for patients with chronic, symptomatic full-thickness tears.

We cannot recommend for or against exercise programmes (supervised or unsupervised) for patients with rotator cuff tears.

We cannot recommend for or against subacromial injections for patients with rotator cuff tears.

We cannot recommend for or against the use of NSAIDs (non-steroidal anti-inflammatory drugs), activity modification, ice, heat, iontophoresis, massage, transcutaneous electrical nerve stimulation (TENS), pulsed electromagnetic field (PEMF), or phonophoresis (that is, ultrasound) for non-surgical management of rotator cuff tears.

- We suggest that patients who have rotator cuff-related symptoms in the absence of a full-thickness tear be initially treated non-surgically using exercise and or NSAIDs.
- We cannot recommend for or against subacromial corticosteroid injection or PEMF in the treatment of rotator cuff-related symptoms in the absence of a full-thickness tear.
- We cannot recommend for or against the use of iontophoresis, phonophoresis, TENS, ice, heat, massage, or activity modification for patients who have rotator cuff-related symptoms in the absence of a full thickness tear.

Early surgical repair after acute injury is an option for patients with a rotator cuff tear.

We cannot recommend for or against the use of perioperative subacromial corticosteroid injections or NSAIDs in patients undergoing rotator cuff surgery.

It is an option for physicians to advise patients that the following factors correlate with less favourable outcomes after rotator cuff surgery: increasing age, MRI tear characteristics, workers' compensation status.

We cannot recommend for or against advising patients in regard to the following factors related to rotator cuff surgery: diabetes, comorbidities, smoking, prior shoulder infection, and cervical disease.

We suggest that routine acromioplasty is not required at the time of rotator cuff repair.

It is an option to perform partial rotator cuff repair, debridement, or muscle transfers for patients with irreparable rotator cuff tears when surgery is indicated.

It is an option for surgeons to attempt to achieve tendon-to-bone healing of the cuff in all patients undergoing rotator cuff repair. We cannot recommend for or against the preferential use of suture anchors versus bone tunnels for repair of

full thickness rotator cuff tears.

We cannot recommend for or against a specific technique (that is, arthroscopic, mini-open, or open repair) when surgery is indicated for full-thickness rotator cuff tears.

We suggest surgeons not use a non-cross-linked, porcine small intestine submucosal xenograft patch to treat patients with rotator cuff tears. We cannot recommend for or against the use of soft-tissue allografts or other xenografts to treat patients with rotator cuff tears.

In the absence of reliable evidence, it is the opinion of the work group that local cold therapy is beneficial to relieve pain after rotator cuff surgery. We cannot recommend for or against the preferential use of an abduction pillow versus a standard sling after rotator cuff repair.

We cannot recommend for or against a specific time interval before initiation of active resistance exercises after rotator cuff repair.

We cannot recommend for or against the use of an indwelling subacromial infusion catheter for pain management after rotator cuff repair.

## ISAKOS, 2010<sup>(35)</sup>

### Key points

Surgical treatment of first-time dislocation is still controversial, however, recent Level I studies with medium- to long-term follow-up have found advantages of surgical treatment in the young active population.... factors are in favour of primary surgical treatment of first-time dislocations in young active individuals, but every case is an individual case and the indications and prognosis should be discussed with the patient.

Spica cast immobilization has never been shown to be beneficial and should be avoided.

### Recurrent dislocations

Success of rehabilitation is highest in multidirectional instability (MDI) and athletes with micro-instability or disabled throwing shoulder, and rehabilitation is less successful in post-traumatic instability.

Preoperative rehabilitation should prepare for the postoperative phase by improving scapular control, rotator cuff strength, and flexibility.

A non-operative rehabilitation programme aims at correcting deficits that relate to symptoms, whereas postoperative rehabilitation should be guided by surgical findings.

The issue of choosing open or arthroscopic repair is becoming obsolete but is still controversial. The way of approaching the shoulder seems less important. The goal of surgical treatment is to identify the pathology and fix the lesion no matter the approach.

### **Posterior instability**

Posterior shoulder instability is not so frequent but often occurs as part of multidirectional instability. In these cases non-operative treatment provides good results. In cases of traumatic posterior labral lesions, surgical treatment may be necessary.

## Appendix 1.3 – UK Examples of Referral Thresholds for Shoulder Arthroscopy

UK Primary Care Trust	Threshold
<p><b>Worcestershire, 2010</b></p>	<p><b>Rotator cuff impingement</b></p> <p>Symptoms include pain on abduction of shoulder between 60° to 120° (= painful arc).</p> <p>If gradual onset symptoms persist, conservative management within primary care should include:</p> <ul style="list-style-type: none"> <li>▪ Referral to physiotherapy or Physio Direct;</li> <li>▪ Steroid injections undertaken by an appropriately trained and experienced physiotherapist or GP (up to three injections with a six-week interval between each);</li> <li>▪ Referral to secondary care if no improvement in symptoms following physiotherapy/steroid injections;</li> </ul> <p>Acute traumatic cuff tears should be urgently referred to secondary care orthopaedic services. A patient over the age of 30 years who has fallen or has dislocated their shoulder and has pain immediately after the fall, should be considered to have an acute tear.</p> <p>If significant night pain that has failed to be alleviated through the above conservative measures or patient has acute onset pain without associated trauma with evidence of muscle wasting, an early urgent referral to secondary care orthopaedic services should be made.</p> <p><b>Frozen shoulder</b></p> <p>May be characterised by pain and restricted external rotation with a normal X-ray.</p> <p>Conservative management within primary care should be tailored as to whether the patient is in acute inflammatory, scarring or recovery phase.</p>

	<ul style="list-style-type: none"> <li>■ Referral to physiotherapy or Physio Direct should be considered for scarring and recovery phases if there has been no improvement in symptoms. Physiotherapy in the acute inflammatory phase is not recommended given the fact it may aggravate severe synovitis within the joint.</li> <li>■ Steroid injections may be considered if no improvement in symptoms.</li> <li>■ If symptoms persist or the patient is in intractable pain, referral to musculoskeletal integrated clinical assessment and treatment services / secondary care should be considered.</li> </ul> <p><b>Glenohumeral osteoarthritis</b></p> <p>Usually presents with a gradual onset of stiffness and pain in the affected shoulder joint and is usually seen in the age groups &gt;65 years, but occasionally it is also seen in the younger age groups following complications of recurrent instability or fractures of the shoulder.</p> <p>Referral to ICATS/OPS should be considered for patients with the following symptoms:</p> <ul style="list-style-type: none"> <li>■ Ongoing pain and discomfort.</li> <li>■ Intractable pain.</li> </ul> <p>It is important to note that osteoarthritic changes within a joint are not always the cause of a patient's symptoms and that the cause of degeneration within a joint is not always osteoarthritis. Therefore, management of patients should be tailored to their individual presentation.</p>
<p><b>BOA/BESS/RCSEng DRAFT Commissioning Guide, Subacromial Shoulder Pain, 2014<sup>(34)</sup></b></p>	<p><b>1.1 Primary care</b></p> <p>Assessment:</p> <ul style="list-style-type: none"> <li>■ diagnosis is based on History and Examination</li> <li>■ correct early diagnosis helps streamline patient care, avoiding delays and incorrect treatment advice</li> <li>■ Primary Care and intermediate clinicians can work</li> </ul>

	<p>through the Algorithm (see Appendix 1), if they arrive at the section highlighted in yellow, then a diagnosis of rotator cuff tendinopathy /impingement is highly likely</p> <ul style="list-style-type: none"><li>▪ check for RED FLAGS</li></ul> <p>Ultrasound and MRI are not usually needed to initially manage this disorder but radiographs are helpful in primary care</p> <p>Emergency referral – same day:</p> <ul style="list-style-type: none"><li>▪ red warm joint with fever – suspected infected joint</li><li>▪ trauma leading to loss of rotation and abnormal shape - unreduced shoulder dislocation.</li></ul> <p>Urgent referral (&lt;2/52) to secondary care:</p> <ul style="list-style-type: none"><li>▪ shoulder mass or swelling – suspected malignancy</li><li>▪ sudden loss of ability to actively raise the arm (with or without trauma) – acute cuff tear</li><li>▪ new symptoms of inflammation in several joints – systemic inflammatory joint disease (rheumatology referral).</li></ul> <p>Management of rotator cuff tendinopathy/impingement:</p> <ul style="list-style-type: none"><li>▪ rest, NSAIDs, simple analgesia</li><li>▪ appropriate structured physiotherapy with goal setting for six weeks to include postural correction and motor control retraining, stretching, strengthening of the rotator cuff and scapula muscles and manual therapy</li><li>▪ do not consider further physiotherapy unless there is improvement during the first six weeks of treatment</li><li>▪ injection of corticosteroids into subacromial space (no more than one, as repeated injection may cause tendon damage)</li></ul> <p>Referral to secondary care:</p>
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	<ul style="list-style-type: none"> <li>■ use shared decision making</li> <li>■ persistent pain and disability not responding to at least six weeks of non-surgical treatment, unless red flag identified</li> <li>■ Consider optimisation of modifiable systemic or local risk factors that may delay surgical treatment prior to referral (such as investigation and treatment of diabetes).</li> </ul> <p><b>1.2 Intermediate care</b></p> <p>This may be provided by certified healthcare professionals in a number of different settings including Integrated Clinical Assessment and Treatment Services (ICATS) and can provide: assessment, non-surgical treatment programmes, referral to secondary care and postoperative care. They should form part of an integrated care programme with close links to primary and secondary care using protocols agreed with the secondary care provider.</p> <p>Assessment</p> <ul style="list-style-type: none"> <li>■ assessment identical to that in primary care</li> <li>■ ensure the correct diagnosis has been made</li> <li>■ re-assess for urgent referral to secondary care</li> </ul> <p>Management of rotator cuff tendinopathy/impingement</p> <ul style="list-style-type: none"> <li>■ Treatment should only be introduced if it did not take place in primary care and the likelihood of helping patients is high. If not refer to secondary care to avoid introducing delay in diagnosis and treatment.</li> <li>■ If patients have improved with six weeks of physiotherapy in primary care, consider a second six weeks of evidence-based physiotherapy to include postural correction and motor control retraining, stretching, strengthening of the rotator cuff and scapula muscles and manual therapy</li> <li>■ Injection of corticosteroids into the subacromial space and/or the acromio-clavicular joint if indicated and</li> </ul>
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	<p>ONLY if not already given in primary care.</p> <p>Refer to secondary care provider</p> <ul style="list-style-type: none"> <li>▪ use shared decision making</li> <li>▪ persistent pain and functional impairment not responding to at least six weeks of evidence-based non-surgical treatments with goal setting; this timeline should include any treatment received in primary care</li> <li>▪ patients who are not suitable for surgery or have decided not to have surgery should be offered an appropriate care package.</li> </ul> <p><b>1.3 Secondary Care</b></p> <p>Assessment</p> <ul style="list-style-type: none"> <li>▪ reassess for Red Flags</li> <li>▪ history – location, radiation and onset of pain, duration of symptoms, history of trauma, exacerbating and relieving factors, involvement of other joints, systemic illness, comorbidities, occupation, hand dominance, level of activity/ sports, patient expectation</li> <li>▪ examination</li> <li>▪ radiographs (if not performed in primary care) and US/MRI to assess the integrity and state of rotator cuff muscles and tendons.</li> </ul> <p>Surgery is indicated for persistent or significant pain and loss of function despite comprehensive non-operative treatment.</p> <p>A shared decision making model should be adopted, defining treatment goals and taking into account personal circumstances.</p> <p>Patients should be informed that the decision to have surgery can be a dynamic process and a decision to not undergo surgery does not exclude them from having surgery at a future time point.</p> <p>Ensure a multidisciplinary approach to care with availability of trained shoulder physiotherapists and shoulder surgeons.</p>
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	<p><b>Acromioplasty</b></p> <p>Arthroscopic subacromial decompression (acromioplasty) involves excision of the bony spur on the antero-inferior surface of the acromion, the 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 painful mechanical irritation of the rotator cuff tendons. It should be considered for patients with:</p> <ul style="list-style-type: none"><li>■ impingement pain in the absence of a rotator cuff tear</li><li>■ impingement pain with an unreparable rotator cuff tear</li><li>■ failure of appropriate conservative management.</li></ul> <p>It is mainly conducted as a day case procedure as long as more extensive surgery is not needed and there are no significant patient morbidities or social reasons to admit the patient overnight.</p> <p>In some cases the acromio-clavicular joint (ACJ) contributes to subacromial pain and may need an additional procedure of excision arthroplasty of the ACJ (open or arthroscopic). This decision should be made by the surgeon based on the clinical findings and after correlation with imaging.</p> <p><b>Rotator cuff repair</b></p> <p>A rotator cuff repair operation aims to reattach the cuff tendons to bone. 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 a subacromial decompression may need to be performed in association with the tendon repair.</p> <p>Rotator cuff repair should be considered in patients with:</p> <ul style="list-style-type: none"><li>■ acute (traumatic or degenerative) rotator cuff tear</li></ul>
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	<ul style="list-style-type: none"><li>■ persistent subacromial shoulder pain and weakness with ultrasound or MRI findings indicating a full thickness rotator cuff tear after adequate and appropriate conservative treatment</li></ul> <p>The relative value of surgical repair, over debridement surgery, and conservative treatment for large and massive irreparable tears is provided by studies such as UKUFF.</p>
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