Introduction
Shoulder disorders cause pain, limit the ability to perform many routine activities, and can significantly disrupt sleep. Self-reported prevalence of shoulder pain is estimated at between 16% and 26% in the general population. Shoulder disorders are the third most common primary care musculoskeletal presentation (after back and neck pain) and, while most people recover within 3 months, recurrence or chronic symptoms may occur in a significant proportion of patients.

Several clinical tests (e.g. Hawkins, Neer, Yergason, Speed) have been described to aid diagnosis of shoulder disorders. However, research acknowledges a lack of consensus on diagnostic criteria and a lack of concordance in clinical assessment, even between musculoskeletal specialists. Furthermore, mixed shoulder disorders occur commonly and over-differentiation between the numerous diagnostic categories is unlikely to alter usual primary care treatment and follow up.

This report will focus on a simplified classification of shoulder disorder, differential diagnoses and referral pointers based on a clinical assessment appropriate within primary care. Treatment choices linked to this classification are presented alongside a summary of the evidence for common interventions.

What are the risk factors?
Both incidence and functional impact increase with age. Lifting heavy loads, repetitive movements in awkward positions and/or prolonged elevation of the upper limb(s) are all associated with the development of shoulder symptoms. Thus, occupations which usually involve such physical risk factors are associated with a higher risk of shoulder disorders. Recognised risk factors for adhesive capsulitis (‘frozen shoulder’) include diabetes and prolonged immobility, for example, after a stroke, after shoulder trauma or surgery, or associated with cardiac disease or surgery. In common with other painful musculoskeletal disorders, psychosocial factors can influence outcomes such as return to normal activities and work.

Clinical assessment of the painful shoulder
The consultation should take a holistic approach, which includes an assessment of the functional impact of the shoulder problem and explores psychosocial and occupational issues. Shoulder pain may arise from elsewhere, so it is important to enquire about the general health of the patient and symptoms arising from the neck, upper limbs, axillae and chest.

History
The issues which should be covered are:
- Determining the onset (acute, sub-acute, recurrent), site, nature, exacerbating and relieving factors and any associated symptoms of the pain.
- Specifically enquiring about the relationship of the pain to movement. Does it occur at rest? Is it nocturnal?
- Is there difficulty sleeping on the affected side? While nocturnal pain may be due to difficulty finding a comfortable sleeping position, consider nerve root pain, bony pain or malignancy, particularly if there is a history of cancer and/or systemic symptoms.
What is the impact on function of the joint? What activities are impaired?

Is the dominant or non-dominant arm affected?

Is there neck or other upper limb pain?

Are any other joints affected?

Is there any history of injury, acute shoulder pain or instability? Does the shoulder ever partly or completely come out of joint or is there concern that it might slip on certain movements?

Enquiring about tasks undertaken at work and sporting activities.

Are there systemic symptoms of illness (fever, night sweats, weight loss, generalised joint pains, rash, new respiratory symptoms)?

Is there a past history of shoulder pain or other musculoskeletal problems? What was the response to treatment?

Enquiring about significant co-morbidity (diabetes, stroke, cancer; respiratory, gastrointestinal, or renal disease; ischaemic heart disease).

Checking current drug treatment and adverse drug reactions.

Examination

The normal shoulder joint has the greatest range of movement of any joint. Assess active, passive and resisted movement in flexion, extension, abduction, adduction, and internal and external rotation. Examine the neck, upper limbs, axillae and chest wall for potential sources of referred pain (Table 1).

<table>
<thead>
<tr>
<th>TABLE 1. Examination of the shoulder joint.</th>
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<tbody>
<tr>
<td>• Inspect shoulders from the front, from the side and from behind for muscle wasting, swelling and deformity.</td>
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<tr>
<td>• Examine the neck, axillae, and chest wall and for lymphadenopathy.</td>
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<tr>
<td>• Assess range of movement of cervical spine.</td>
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<tr>
<td>• Palpate sternoclavicular, acromioclavicular and glenohumeral joints for tenderness, swelling, warmth and crepitus.</td>
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<tr>
<td>• Compare power, stability and range of movement (active, passive, resisted) of both shoulders.</td>
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<td>• Observe scapular movement.</td>
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<tr>
<td>• Look for a painful arc (70–120° active abduction).</td>
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<tr>
<td>• Test passive external rotation (less than 50% range of movement compared to the unaffected side suggests a glenohumeral problem).</td>
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<tr>
<td>• Test for a significant rotator cuff tear (‘drop arm test’ – patient unable to support the weight of the affected arm abducted to 90°).</td>
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</table>

Red flag indicators

Red flag indicators include symptoms and signs of systemic disease, generalised or localised lymphadenopathy, history of cancer, unexplained significant neurological deficit, and concerning local features such as a palpable mass or bony tenderness (Table 2).

<table>
<thead>
<tr>
<th>TABLE 2. Shoulder pain: red flag indicators.</th>
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<tbody>
<tr>
<td>• Tumour: history of cancer; symptoms and signs of cancer; unexplained deformity, mass, or swelling, lymphadenopathy</td>
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<tr>
<td>• Infection: red skin, fever, systemically unwell</td>
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<tr>
<td>• Unreduced dislocation: trauma, epileptic fit, electric shock; loss of rotation; abnormal shape</td>
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<tr>
<td>• Acute rotator cuff tear: recent trauma, acute disabling pain and significant weakness, positive drop arm test</td>
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<td>• Neurological lesion: unexplained wasting, significant sensory or motor deficit</td>
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Investigations

While plain radiography may be entirely appropriate to exclude fracture and/or dislocation in the context of trauma, it is not usually indicated in the primary care assessment of shoulder pain, unless, for example, malignancy is suspected. Malignancy and systemic illnesses are relatively rare causes of shoulder pain, thus blood tests (full blood count, erythrocyte sedimentation rate) should likewise only be requested if there are red flag indicators.

Causes of shoulder pain

Diagnosis should be based on a clinical assessment, summarised in the clinical algorithm opposite, which groups patients according to the most common presentations.

The causes of shoulder pain may usefully be divided into conditions associated with pain arising from the shoulder joint and those conditions where the pain arises from elsewhere (Table 3). This report will summarise the diagnosis and management of the three commonest shoulder disorders presenting to primary care physicians: rotator cuff disorders, glenohumeral joint problems and acromioclavicular joint problems. Referred mechanical neck pain is usually easily differentiated from a shoulder disorder as the pain and tenderness are localised to the neck and the suprascapular area and referred to the shoulder and arm, and also may be associated with upper limb paraesthesia. Movement of the cervical spine and shoulder usually produces more generalised upper back, neck and shoulder discomfort.
FIGURE 2. Diagnosis of shoulder problems
with guidelines for initial management

**Neck or shoulder or other?**
- Symptoms localised to neck or shoulder?
- Move the neck and then the shoulder
- Does this reproduce the pain?

- **Neck**
  - Common age 35+
  - Management
    - Perform neurological examination. If positive findings then refer
    - Rest
    - NSAIDs/analgesia
    - Physiotherapy

- **Shoulder**
  - History of instability?
    - Has your shoulder ever partly or completely come out of joint?
    - Are you worried that your shoulder may dislocate or slip in the joint on sporting activity or on certain movements?

- **Other neck or arm**
  - Common age 35+
  - Management
    - Rest
    - NSAIDs
    - Physiotherapy

**RED FLAGS – urgent referral**
See Table 2

**Acromioclavicular joint disease (uncommon)**
- Common age 30–50 years
- Management
  - Rest
  - NSAIDs/analgesia
  - Consider cortisone injection

**Glenohumeral joint**
- Frozen shoulder
  - Common age 40–60 years
- Arthritis
  - Uncommon
  - Common age 60+
- Management
  - Cortisone injection
  - Refer
  - Surgery

**Rotator cuff/impingement**
- Common age 35–75 years
- Management
  - Rest
  - NSAIDs/analgesia
  - Consider physiotherapy
  - Refer
  - Surgery

**Other neck or arm pain**
- Common age 35–75 years
- Management
  - Rest
  - NSAIDs/analgesia
  - Physiotherapy
  - Refer

**Adapted with kind permission of the Oxford Shoulder and Elbow Clinic, Nuffield Orthopaedic Centre NHS Trust, Oxford**
TABLE 3. Causes of shoulder pain.

<table>
<thead>
<tr>
<th>Pain arising from the shoulder</th>
<th>Pain arising from elsewhere</th>
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</thead>
<tbody>
<tr>
<td>• Rotator cuff disorders: rotator cuff tendinopathy, calcific tendinitis, impingement, subacromial bursitis, rotator cuff tears</td>
<td>• Referred pain: neck pain, myocardial ischaemia, referred diaphragmatic pain</td>
</tr>
<tr>
<td>• Glenohumeral joint problems: capsulitis (‘frozen shoulder’), arthritis</td>
<td>• Polyomyalgia rheumatica</td>
</tr>
<tr>
<td>• Acromioclavicular joint problems</td>
<td>• Malignancy: apical lung cancers, metastases</td>
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<tr>
<td>• Infection (rare)</td>
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</tr>
<tr>
<td>• Traumatic dislocation</td>
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</table>

Common shoulder disorders

Rotator cuff disorders

In all rotator cuff disorders (Table 3), there is significant overlap of presenting symptoms and signs. The rationale for grouping these disorders together is that treatment, management and follow up are similar.

**Rotator cuff tendinopathy** is the most common cause of shoulder pain. There is often a history of physical risk factors associated with occupational or sporting activities and pain with overhead upper limb movements. Inspection may reveal muscle wasting. On examination, pain is reproduced on abduction with the thumb down and is worse against resistance. While active and resisted movements are painful and may be partially restricted, passive movements tend to be full. The presence of a painful arc reinforces the diagnosis of a rotator cuff disorder, but research has suggested that it is neither specific nor sensitive as a clinical sign.

The age of the patient, the mode of onset and character of the pain (acute or subacute onset, history of trauma), and functional impairment (exacerbation with overhead activities and painful weakness of shoulder movements) may indicate a diagnosis of **rotator cuff tear** rather than tendinopathy. In young people there is usually a history of acute onset after trauma. In the elderly, a rotator cuff tear may be atraumatic, related to intrinsic degeneration of the cuff or to attrition from bony spurs on the undersurface of the acromion, or secondary to inflammatory arthritis. A partial tear may exhibit similar features on clinical examination to rotator cuff tendinopathy (muscle wasting and painful weakness in resisted abduction may occur in either condition). The ‘drop arm test’ (Table 1) has been described as a useful test for a large or complete tear and is an easy technique to incorporate into examination of the joint.

A study which used magnetic resonance imaging of the shoulder joint in asymptomatic individuals found a high prevalence of abnormalities, including partial and full thickness tears. Thus there may be little or no correlation between symptoms and functional impairment and the type and severity of the tear.

Glenohumeral joint problems

Adhesive capsulitis (‘frozen shoulder’) and glenohumeral arthritis are characterised by deep joint pain, which causes significant restriction of activities of daily living due to impaired external rotation, for example putting on a jacket. Sleep is often disturbed. In adhesive capsulitis, three phases may be described over a period of 18–24 months:

1. **initial** phase, gradual onset of diffuse and severe shoulder pain, typically worse at night with inability to lie on the affected side
2. **stiff phase** with less severe pain present at the end range of movement, global stiffness and severe loss of shoulder movement
3. **recovery phase** with a gradual return of movement.

During the stiffening phase of the process, the joint capsule thickens and becomes stiff, rather like scar tissue. It is physically difficult to penetrate at arthroscopy.

Typically, there is significant restriction (over 50%) of passive external rotation, compared to the unaffected shoulder. Overall, global pain and restriction of all active and passive movements are present.

Acromioclavicular joint problems

Acromioclavicular disorders in younger people are usually secondary to injury, and sometimes joint dislocation may occur. Acromioclavicular osteoarthritis may be the cause of localised symptoms in the elderly, and in this age group may also be associated with rotator cuff disorders such as subacromial impingement and tendinopathy. Pain, tenderness and occasionally swelling are localised to the acromioclavicular joint. There is restriction of passive horizontal abduction (flexion) of the shoulder, with the elbow extended across the body.

Treatment

For all shoulder disorders recommend regular analgesia, encourage the patient to maintain activity (within limits), advise on occupational issues and provide written ‘self-help’ information. Paracetamol is suitable as a first-line treatment and may be supplemented by mild opiates such as codeine phosphate. If no contraindications exist, non-steroidal anti-inflammatory drugs (NSAIDs) may be used short term. In the elderly, specifically counsel about the increased risk of upper gastrointestinal side-effects and impact on renal function and cardiovascular risk with NSAIDs, and in all patients the risks of dependence and constipation with regular opiate analgesics.
**Practical tips**

**Useful patient information:**
- Arthritis Research Campaign information booklet, ‘The Painful Shoulder’: www.arc.org.uk/arthinfo/patpubs/6039/6039.asp
- NHS Direct: www.nhsdirect.nhs.uk

**Specialist/occupational health information:**
- The Health and Safety Executive website provides useful guidelines for employers: www.hse.gov.uk/msd/hsemsd.htm#uld

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**Rotator cuff disorders**

While relative rest in the early stages is appropriate for rotator cuff disorders (including possible minor tears), the patient should aim to return to normal activity as soon as possible. Attention to occupational factors is important in order to reduce the risk of long-term incapacity and loss of employment. Changes may need to be made within the workplace in order to facilitate early return to work, for example a phased return to work or a temporary respite from work involving repetitive shoulder movements or heavy lifting.

Overall there is a lack of high-quality clinical trial evidence for common primary care treatments for rotator cuff disorders. Many of the studies have been undertaken in a secondary care setting and involved complex interventions which are not easily reproduced in primary care. In a primary care population, participants presenting with undifferentiated shoulder disorders who were allocated to a physiotherapy treatment group were less likely to re-consult with a GP than those receiving steroid injections alone.11

Systematic reviews suggest equivalent short-term benefit for physiotherapy (incorporating supervised exercise) and steroid injections in the management of shoulder disorders.12 Subacromial corticosteroid injections (see British National Formulary www.bnf.org/bnf/), up to 10 ml in volume, may relieve pain and thus facilitate rehabilitation, but the effect may be small and relatively short-lived.12 If the initial response is good, the injections could be repeated up to three times, at 6-weekly intervals. As there is no evidence that steroid injections are either beneficial or harmful in the presence of a rotator cuff tear, they should be avoided if the history and examination suggest a large or complete tear.

**Glenohumeral joint problems**

The classical history of adhesive capsulitis is resolution after 18–24 months, although symptoms may persist for 3 years or more, particularly in diabetic patients. The mainstay of management is pain relief and maintenance of function, and treatment can be tailored to the presenting phase. For example, active physiotherapy alone may be distressing and counterproductive if started in the early, painful phase of the condition, but starting soon after intra-articular corticosteroid injections may be of short-term benefit.13 Gentle mobilisation and strengthening exercises may improve mobility and reduce disability in the later phases.

**Acromioclavicular joint problems**

If there is significant traumatic dislocation, refer the patient. Otherwise, complete resolution of symptoms is usual following rest and simple analgesia. Consider steroid injection of the joint if symptoms persist despite conservative management.

**Other interventions**

Clinical trials of acupuncture treatment for shoulder problems have tended to be too small and methodologically diverse to provide robust evidence of benefit, apart from some short-term pain relief after treatment. Occupational factors have been implicated in the development of shoulder disorders and there is evidence that the prognosis of both neck pain and low back pain are influenced by individual psychosocial factors (general psychological distress, fear of movement, passive coping style). However, a systematic review of a limited evidence base found multidisciplinary biopsychosocial rehabilitation for shoulder problems in adults of working age no better than ‘usual care’.14
Referral criteria

The patient should be referred to an orthopaedic specialist if there is:

- diagnostic uncertainty or any of the red flag criteria summarised in Table 2
- history of shoulder joint instability
- acute, severe post-traumatic acromioclavicular pain
- pain and significant disability lasting more than 6 months, despite attention to known physical risk factors and, if indicated, treatment with physiotherapy and steroid injections.

KEY PRACTICE POINTS

- Self-help advice and discussion of physical contributory factors should be provided, in addition to analgesics.
- Referral for physiotherapy may improve short-term outcomes and reduce GP consultations for shoulder pain.
- Steroid injections have a marginal short-term effect on pain.
- Mild trauma or overuse (before the onset of pain), early presentation and acute onset have a more favourable prognosis.
- Poorer prognosis is associated with increasing age, diabetes, severe or recurrent symptoms at presentation, and associated neck pain.
- Consider orthopaedic referral for surgical assessment when primary care measures fail.

Acknowledgement

This paper (including the tables) is derived from the following clinical review: Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. BMJ 2005;331(7525):1124-8. www.bmj.com/cgi/content/full/331/7525/1124.

References

COMMENT

Shoulder pain is a very common cause of disability in the community. To a large extent it has been overlooked both in terms of the amount of morbidity it causes and also in terms of how it should best be managed. This excellent overview summarises the approach to the management of shoulder pain in primary care. It distinguishes the different types and patterns of shoulder pain and provides guidelines for early management. Significantly it distinguishes conditions involving the rotator cuff (impingement and rotator cuff tear) from disorders of the glenohumeral joint (frozen shoulder) and osteoarthritis. The management strategy of these conditions is different and it is important for doctors in primary care to be able to distinguish them. This can be done fairly straightforwardly with simple attention to aspects of examination in the surgery. In primary care complicated imaging is rarely needed for shoulder disorders and is best left to severe cases or cases which fail to respond to treatment and need management in secondary care. A substantial number of operative procedures are now available for shoulder disorders and the review provides advice about the best time to refer patients to secondary care.

A large number of questions about shoulder disorders remain unanswered, for example:

1. Can a better treatment for frozen shoulder be found – for example are new anti-inflammatory medications going to be useful?
2. How many injections should be given into the subacromial bursa or shoulder joint before they cause damage to tendon or other tissue?
3. Is accurate placement of an injection using ultrasound guidance a better way of managing disorders of the subacromial bursa and rotator cuff?
4. What is the best timing of management for rotator cuff tears? Should early surgery be advocated to prevent progression and the development of unmanageable massive tears?

Further research into both the natural history investigation and treatment of disorders including impingement, rotator cuff tear and osteoarthritis is currently being supported by the Arthritis Research Campaign (arc) and should allow us to give better advice to patients in the future.

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Nuffield Professor of Orthopaedic Surgery
2008 BSR Annual Meeting, Liverpool
Primary Care Day : 22 April 2008

SHOULDER PAIN

The British Society for Rheumatology, Primary Care Rheumatology Society and the arc Primary Care Working Group are running a combined educational day on shoulder pain aimed at GPs, rheumatologists and health professionals in rheumatology.

Topics include:

- Functional anatomy of the shoulder and common shoulder problems
- ‘Hands on’ examination session
- Operative treatment of shoulder problems
- Imaging of the shoulder – including a practical demonstration of musculoskeletal ultrasound
- Sports injuries affecting the shoulder and their treatment/rehabilitation

For full details visit:
www.bsrconference.org.uk/primarycareday.html