



# Clinical examination of the shoulder girdle

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The shoulder girdle acts as a zone of transition. It is localized between three other regions: the cervical spine, the upper thoracic spine and the shoulder.

## Symptoms referred to the shoulder girdle

Pain originating from the cervical spine or from the upper thoracic spine is frequently felt at the shoulder girdle, for example at the base of the neck, in the trapezius muscle or in the scapular area. It may also radiate towards the subclavicular, pectoral or axillary regions or into the upper limb. This overlaps with possible symptoms from shoulder girdle disorders.

Shoulder girdle movements are therefore included in both the cervical (see Chapter 6) and thoracic (see Chapter 25) examinations. This preliminary screening may arouse suspicion about the shoulder girdle.

## Symptoms referred from the shoulder girdle

Pain that originates from a disorder in the shoulder girdle is usually experienced at the base of the neck, in the

pectoroclavicular area or in the trapezius muscle. It rarely spreads down the arm and thus arm pain may implicate either the spine or the shoulder.

Paraesthesia in the arm may result from a condition affecting the brachial plexus in the shoulder girdle.

## History

Symptoms from a disorder in the shoulder girdle are not typical. They mimic those of neck, upper thorax or shoulder.

History-taking will therefore start in the same way as for the examination of the cervical (see Chapter 6) or thoracic spine (see Chapter 25) or of the shoulder (see Chapter 12). The examiner will notice elements that may lay blame on the spinal joints (e.g. pain shifting from the centre to one side) or features that point towards a lesion of the shoulder girdle (e.g. increase of symptoms following scapular movements).

## Inspection

On inspection, special attention must be given to swelling (i.e. in the supraclavicular fossa), changes in the colour of the skin, muscular atrophy, difference in height of the shoulders and winging of the scapula.

## Functional examination

The functional examination of the shoulder girdle is never done as primary testing but follows evaluation of one of the other regions, which may provide elements that implicate the shoulder girdle.

Clinical examination of the shoulder girdle is an accessory to general assessment.

If the patient has described symptoms that could originate from the spine or from the shoulder, the cervical, thoracic or shoulder examination is performed. When, in this examination, signs are found that point towards the shoulder girdle (e.g. positive scapular tests), these will be examined thoroughly.

When the history is unspecific a preliminary examination (quick survey) of the upper quadrant is done (see p. 212). This includes tests for:

- the neck
- the shoulder girdle
- the shoulder
- the arm: as a neurological examination and to exclude local disorders in the upper limb.

Functional examination of the shoulder girdle is very simple: three active, three passive and four resisted movements are performed (see Fig. 1), summarized in Box 1.



## Active movements

The active tests cause movement in the three primary articulations. During all active movements (Fig. 2), attention is paid to pain, range of motion and abnormal sensations, such as paraesthesia or crepitus. The movements may stretch inert or contractile structures and make muscles work. A decreased range of movement is usually the result of either a neurological disorder or a problem of an inert structure.

## Active elevation of both shoulders ('shrugging')

The examiner stands behind the patient and asks for both shoulders to be shrugged. This movement requires full mobility of the scapulae. The normal range is between 30 and 45°.

### Box 1

#### Summary of examination of the shoulder girdle

##### Active movements of the shoulders

Elevation of both shoulders  
Protraction of both shoulders  
Retraction of both shoulders

##### Passive movements of the shoulder

Elevation  
Protraction  
Retraction

##### Resisted movements of the shoulder

Elevation  
Protraction  
Retraction  
Depression

##### Palpation

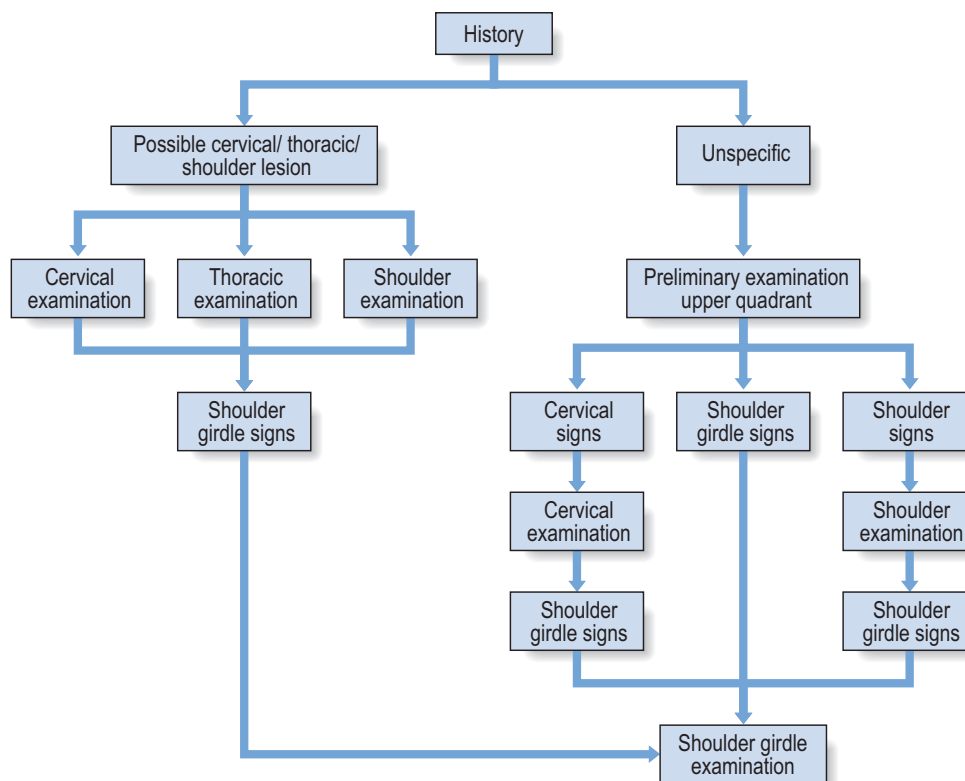


Fig 1 • Strategy for the examination of the shoulder girdle.



**Fig 2** • Active movements of the shoulders: (a) elevation; (b) protraction; (c) retraction.

### Active protraction of both shoulders

The patient brings both shoulders forwards. The normal range of scapular abduction is about 30°.

### Active retraction of both shoulders

The patient is asked to pull both shoulders backwards. Normally, about 30° is possible.

### General considerations concerning active scapular movements

A difference in height between the shoulders on shrugging indicates impaired mobility. This may be the result of disturbance of the scapulothoracic gliding mechanism or of a neurogenic condition leading to weakness of the scapular elevators.

Pain found on active elevation may be due to a problem of a contractile or an inert structure. Passive and resisted movements reveal the true nature of the lesion. Crepitus present on active elevation means the posterior thoracic wall has roughened, which often has an unknown cause. Paraesthesia when the shoulders are kept shrugged for a while are pathognomonic of a thoracic outlet syndrome (postural variety).

Pathological findings on the other active movements may be due to muscular activity, stretching of an inert structure or a movement in one of the three primary articulations (acromioclavicular joint, sternoclavicular joint or scapulothoracic gliding surface).

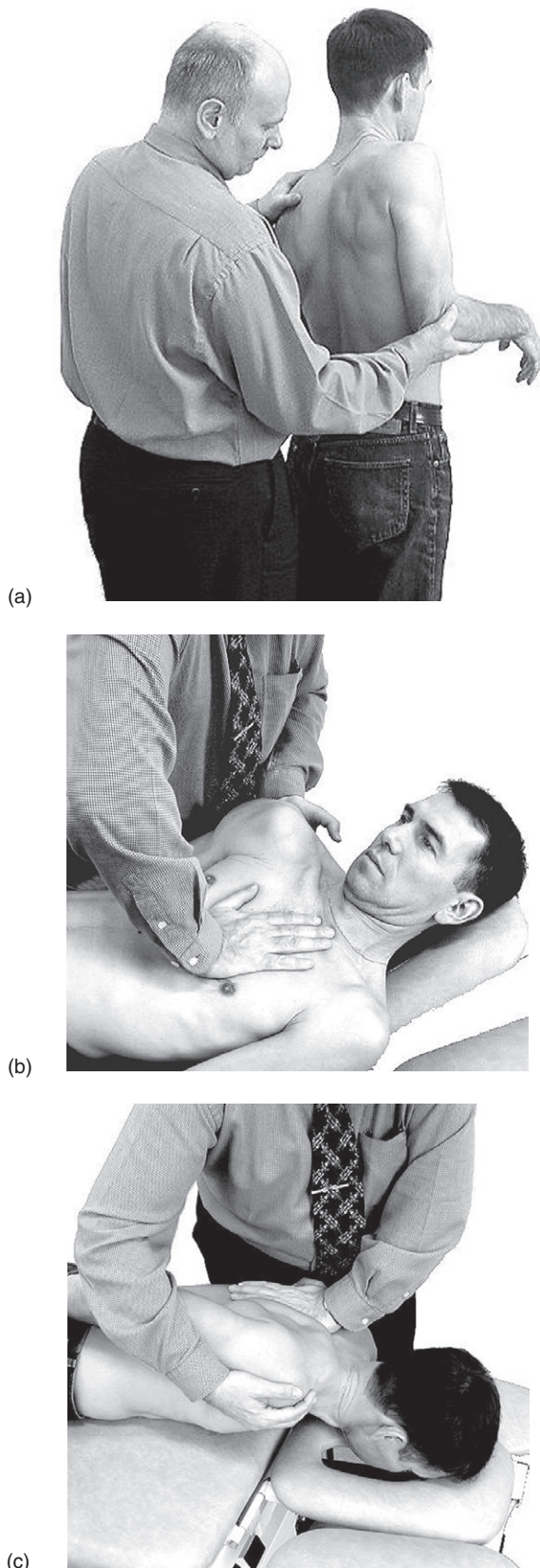
Because active elevation, retraction and protraction of the shoulders pull the dura mater in a cranial direction via the first thoracic nerve root, pain on one of these movements may have a dural origin. This may occur in thoracic discodural interactions.

### Passive movements

For a clear differential diagnosis between disorders of inert and contractile structures, active tests must be followed by passive and resisted movements. Passive movements (Fig. 3) put local inert structures under tension, have some influence on the joints at both ends of the clavicle and may passively stretch some contractile structures. Because the scapula glides on the thorax during these movements, the scapulothoracic gliding surface also must function properly.

The problem can be either of the scapulothoracic gliding surface, as in scapular metastases, or of one of the musculoligamentous attachments of the scapula to the trunk, or the outcome of an apical tumour of the lung. Total ankylosis of the acromioclavicular or of the sternoclavicular joint due to ankylosing spondylitis or to arthrosis is another possible cause.

For all passive tests, attention is paid to their influence on the pain, the range of movement and the end-feel. The 'normal' range of movement is the same as for the active tests; in normal subjects, the end-feel is elastic for all three passive movements, due to combined ligamentous and muscular stretching.



**Fig 3** • Passive movements of the shoulder: (a) elevation; (b) protraction; (c) retraction.

### Passive elevation of the shoulder

The examiner stands behind the patient, places one hand underneath the flexed elbow and brings the shoulder up by an upward directed pressure on the olecranon. The other hand fixates at the contralateral side of the base of the neck (Fig. 3a).

### Passive protraction of the shoulder

The patient is supine. The examiner stands at the patient's painful side and asks the patient to bring the shoulder forwards actively. The ipsilateral hand on the sternum is used for fixation, with the contralateral hand on the scapula. The patient is then asked to relax and the examiner continues the movement passively to the end of range where an extra pressure is given to assess end-feel (Fig. 3b).

### Passive retraction of the shoulder

The patient is asked to lie prone with the arm on the back. The examiner, at the patient's painless side, asks the patient to pull the shoulder actively backwards and then places the contralateral hand at the spine and fixes that area. The ipsilateral hand lies at the anterior aspect of the shoulder. The patient is asked to relax and the examiner continues the movement passively to the end of range where an extra pressure is given for the judgement of the end-feel (Fig. 3c).

## Resisted movements

During resisted movements (Fig. 4) pain and weakness are assessed.

### Resisted elevation of the shoulder

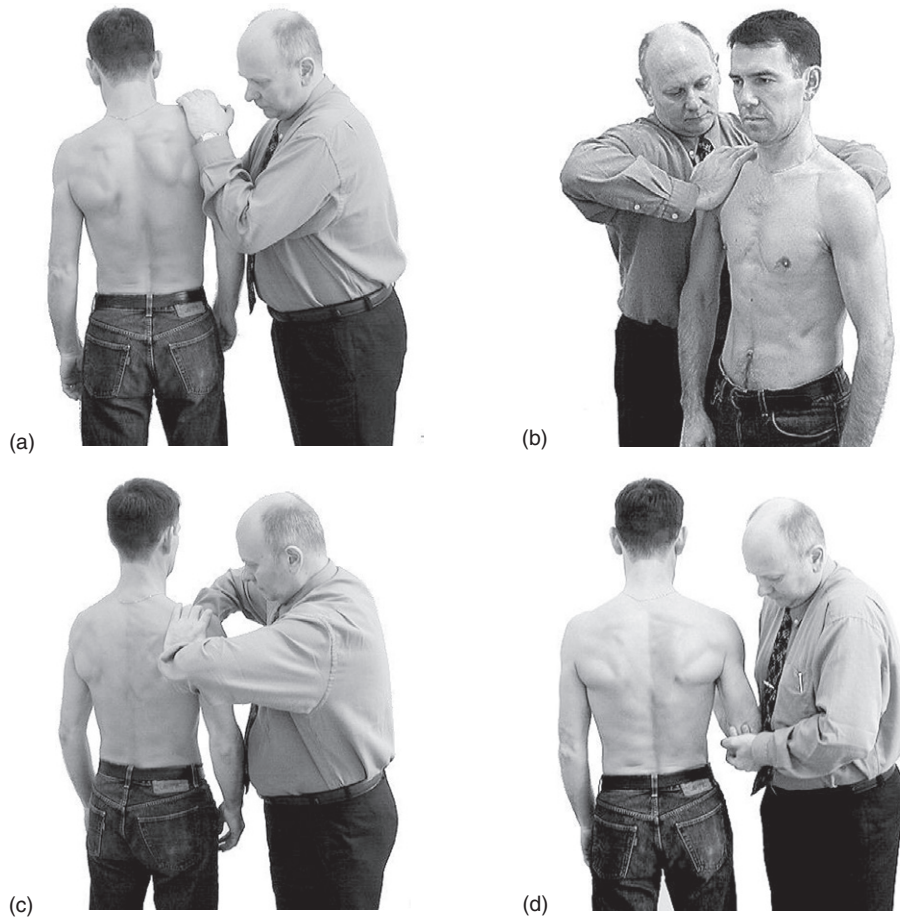
The examiner stands at the patient's painful side and puts both hands on the shoulder. The patient is asked to shrug the shoulder against the examiner's resistance (Fig. 4a). This movement tests the levator scapulae and the upper part of the trapezius, as well as the integrity of the C2–C4 nerve roots.

### Resisted protraction of the shoulder

The examiner stands at the patient's side and puts one hand on the anterior aspect of the shoulder, the other one on the posterior thorax between the scapulae. The patient is now asked to press the shoulder forwards (Fig. 4b). This is a test for the pectoralis major, serratus anterior and pectoralis minor muscles.

### Resisted retraction of the shoulder

The same technique is used as for resisted protraction but one hand is placed on the posterior aspect of the shoulder and one on the sternum (Fig. 4c). The following muscles are tested: rhomboids, middle and lower parts of the trapezius and latissimus dorsi.



**Fig 4** • Resisted movements of the shoulder: (a) elevation; (b) protraction; (c) retraction; (d) depression.

### Resisted depression of the shoulder

The patient bends the elbow to a right angle. The examiner puts both hands under the elbow and asks the patient to press down (Fig. 4d). This test examines the pectoralis minor, subclavius or latissimus dorsi muscle.

### Palpation

The functional tests are sometimes followed by palpation, if the structure at fault lies within the reach of the fingers.