

*Ministry of Defence*

## **Synopsis of Causation**

### **Recurrent Dislocation of the Shoulder**

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## **Disclaimer**

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This synopsis has been completed by medical practitioners. It is based on a literature search at the standard of a textbook of medicine and generalist review articles. It is not intended to be a meta-analysis of the literature on the condition specified.

Every effort has been taken to ensure that the information contained in the synopsis is accurate and consistent with current knowledge and practice and to do this the synopsis has been subject to an external validation process by consultants in a relevant specialty nominated by the Royal Society of Medicine.

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# 1. Definition

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- 1.1. The **shoulder joint** is formed by the head of the [humerus](#) moving against the [glenoid fossa](#) (the glenohumeral joint) and within the wider area defined by the [acromion](#), the [coracoid process](#) and the [coracoacromial](#) and [coracohumeral ligaments](#). The glenohumeral joint is shallow and, along with the [acromioclavicular joint](#), allows a wide range of movement at the shoulder. The glenohumeral joint is stabilised by the glenohumeral ligaments and the [rotator cuff](#) musculature, especially the [subscapularis](#), while further stability of the shoulder is provided by muscles including the [deltoid](#).
- 1.2. Subluxation of the shoulder occurs when the [articular](#) surface of the head of the humerus is partially displaced from its usual range of contact with the glenoid fossa. If full displacement takes place then **dislocation** has occurred. The distinction between subluxation and dislocation is one of degree and for the purposes of this synopsis the term “dislocation” will be used in its broader, literal sense to include all degrees of displacement.
- 1.3. **Recurrent** dislocation is dislocation returning after one or more intermissions indicating at least one previous episode.
- 1.4. Recurrent dislocation occurs [anteriorly](#) in the vast majority of cases, with the rest being [posterior](#) or, rarely, [inferior](#) or [superior](#).<sup>1,2,3</sup>

## 2. Clinical features

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- 2.1. Dislocation of the shoulder due to **injury** is accompanied by severe pain and inability to move the upper arm. However, in people who have very lax joints, pain may be very much less and mobility less impaired.
- 2.2. After **anterior** dislocation the head of the humerus can often be felt, with a palpable hollow just below the [acromion](#). The arm is usually held in a position of [abduction](#) and [internal rotation](#).
- 2.3. After **posterior** dislocation the arm is more likely to be held in [adduction](#) and internal rotation. The anterior aspect of the shoulder is usually less rounded than on the other side. This deformity is best seen from above.
- 2.4. Features of interference with blood supply or nerve supply to the arm can occur in some cases and must always be carefully assessed and promptly dealt with if longer term complications are to be avoided. The [axillary nerve](#) is particularly vulnerable to damage.
- 2.5. [Anteroposterior](#) and [lateral](#) X-ray views are important in assessment but may not always be available before [reduction](#), which should be effected promptly. [MRI](#) scans are sometimes used to reveal details of tissue injuries if surgical repair procedures are being considered, but are not needed at the immediate assessment stage. Other specific physical findings are often sought by the examining clinician.
- 2.6. With a **recurrent** episode of shoulder dislocation there may be no clear cut prior causative event, although such dislocations often occur during activities such as throwing, using a racquet overhead or swimming. The individual may describe a feeling of the shoulder slipping out of the joint or of the arm going numb.
- 2.7. In an individual prone to **recurrent** dislocation the physical findings may include some deformity of the shoulder and/or the [scapula](#), muscle [wasting](#), and loss of symmetry between the two sides. There is often demonstrable increased mobility of the head of the humerus within the glenoid fossa.
- 2.8. Different **types of damage** can occur :
  - 2.8.1. After **anterior** recurrent dislocation of the shoulder :
    - the Bankart [lesion](#) is almost always present, ([avulsion](#) of the anterior aspect of the [capsulolabral](#) tissues in the lower half of the glenoid fossa)<sup>1,4,5,6,7</sup> Such tissue disruption causes weakness of the anterior aspect of the joint which contributes to instability, particularly if the arm is put into a position of [external rotation](#) in abduction.
    - an impression fracture on the posterior aspect of the head of the humerus (the Hill-Sachs lesion) occurs in most people with recurrent anterior dislocation<sup>1,5</sup> The indentation is usually small and has little or no effect on instability, but if it involves more than 30% of the head's articular surface it may catch on the anterior edge of the glenoid fossa and cause re-dislocation.<sup>1,8</sup>

- rotator cuff tears can occur in older patients
- bony damage to the glenoid rim may be more important than was previously realised<sup>1</sup>

2.8.2. After **posterior** dislocation, long posterior [labral](#) tears and posterior capsulolabral avulsion are often found,<sup>9,10</sup> and contribute to instability of the joint.

### 3. Aetiology

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The causes of recurrent dislocation of the shoulder vary in each individual and may include some or all of the following factors :

- 3.1. **Constitutional or inherited** characteristics include the degree of laxity in joints which can vary from minimal to very marked in different individuals and is of particular importance in the shoulder joint. Lax joints dislocate more easily. If laxity of the shoulder joint allows abnormal movement of the humeral head the joint is considered to be **unstable**. It is **instability** of the joint which leads to recurrent dislocation of the shoulder.
- 3.2. The **type of incident** leading to dislocation can be used to define two groups<sup>1</sup>:
  - An **atraumatic** group with inherent joint laxity
  - A **traumatic** group where joint laxity is far less marked

However, individual cases may exhibit features within both groups.

- 3.2.1. People in the **atraumatic group** are characterised by a tendency to shoulder dislocation after what would seem to be a minor incident: bowling at cricket, playing an overhead shot in sports such as tennis, sometimes even just an untoward, awkward movement of the arm, especially in abduction and external rotation.
  - 3.2.1.1. Such individuals may have a family history of recurrent shoulder dislocation and some have a history of **bilateral** shoulder dislocation.
  - 3.2.1.2. People in this group also tend to show laxity in other joints. They can, of course, injure a shoulder just the same as anyone else, when the dislocation would probably be anterior and share other features of the traumatic group.
  - 3.2.1.3. Dislocation of the shoulder can also occur as a result of a **stroke**.<sup>11</sup> In such cases the displacement is due to muscle weakness and is usually inferior and slight.
- 3.2.2. People in the **traumatic group** usually have a clear history of an injury which caused their first shoulder dislocation, usually **unilateral**. If instability of the shoulder joint occurs it usually does so within the first 2 years after the initial injury.<sup>1</sup>
  - 3.2.2.1. In this group, there is no inherent joint laxity and the main primary causes are related to contact sports in the young and falls in the elderly.<sup>1</sup>
  - 3.2.2.2. People who have **epileptic fits** may dislocate a shoulder posteriorly during an attack, and if instability arises it can be considered traumatic in type, although, again, those with inherited laxity in joints are more vulnerable to dislocation. Sometimes bilateral posterior dislocation can occur. These points also apply to people who suffer from an **electric shock**.
  - 3.2.2.3. In this traumatic group dislocation due to an injury is most likely to occur when the arm is in a position of abduction and external rotation, or when a direct blow to the shoulder is sustained.<sup>1</sup>

3.3. In both atraumatic and traumatic groups the **age of the individual at the time of the first dislocation** is the main factor in determining the likelihood of recurrent instability<sup>1,12</sup>:

- The younger a person is, the more likely he is to suffer recurrence
- Young people are more likely to have capsulolabral avulsion. If this is suspected MRI scanning or [arthroscopy](#) is indicated as it can only be seen on X-ray if the avulsion includes bone. This damage makes recurrent dislocation more likely
- Young people are less likely to comply fully with [rehabilitation](#) advice such as keeping the shoulder immobilised for sufficient time
- Young people are more likely to return to competitive sport quickly<sup>1</sup>

3.4. **Voluntary dislocation** of the shoulder<sup>13</sup> is considered by some to be attention-seeking behaviour.<sup>14</sup> Even so, individuals may cause joint tissue damage in the process and the clinical effects may become indistinguishable from those in other patients.<sup>15,16,17,18</sup>

## 4. Prognosis

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4.1. With ever improving techniques in surgical repair of damaged shoulder joint tissues the vast majority of individuals with recurrent dislocation become free of recurrence and can frequently return to normal activities, even contact sports.<sup>1,19</sup>

4.2. However, while the incidence of recurrence can be reduced by intensive rehabilitation after the initial episode in younger patients, a number of factors can adversely affect prognosis in those who do go on to develop recurrent dislocation:

4.2.1. **Delay in initial treatment** can be crucial. Early reduction of shoulder dislocation is an important part of management, especially in younger patients. It follows that prompt diagnosis is essential, even in difficult circumstances, such as on the sports field or training ground, in the mountains or at work. Fortunately, anterior dislocations, the commonest by far, are easily diagnosed, but with posterior dislocations diagnosis can be difficult<sup>20</sup> and any corresponding delay may increase the risk of recurrence. Delays in diagnosis of months or even years can occur.<sup>21</sup>

4.2.2. The **type of surgical repair** can influence the risk of recurrence. The increasing use of modern technologies, such as MRI and arthroscopy, reveals that the tissue damage factors that contribute to shoulder instability are complex<sup>1</sup>:

- Bony damage to the glenoid rim may partially account for the failure of arthroscopic repair techniques to match the results obtained by [open surgery](#) where such bony lesions can be more easily dealt with<sup>1</sup>
- There is now a trend towards repairing and re-tensioning of soft tissues at open surgery, rather than using techniques solely aimed at restriction of movement<sup>1</sup>

Overall, recurrence of shoulder dislocation after open surgery is less than 10%,<sup>1</sup> but rates of recurrence after arthroscopic repair are not so clear, varying somewhat between studies, but are still higher than for open repair.<sup>1,22,23</sup>

4.2.3. **Problems associated with surgical repair** can also contribute to recurrence risk. The recurrences which do occur after operation may be due to :

- inappropriate selection of individuals for the chosen procedure<sup>24</sup>
- errors of technique at operation,<sup>25,26,27,28</sup> including damage to nerves or blood vessels
- multiple episodes of shoulder dislocation before surgery is carried out
- poor state of the tissues of the shoulder joint.<sup>29,30</sup> Stretched or scarred ligaments may limit the repair potential, as may other tissue lesions.

4.2.4. **Post-operative problems** contributing to recurrence can include :

- breakdown of repaired tissues



- failure of the individual to fully comply with post-operative management
- return to contact sport<sup>31,32</sup>

4.2.5. **Other management factors**, such as variations in immobilisation duration or in intensive rehabilitation schedules show no consistent advantage in the recurrence rate of one regime over another.<sup>12,33</sup>

4.2.6. **The number of recurrences** of dislocation contribute as the more often dislocation occurs the more the soft tissues may be stretched and the more bony damage may occur. Repeated recurrences can occur even though the individual makes every effort to be careful, but undoubtedly continuing to pursue adverse activity after recurrent dislocations will increase the risk of more severe instability.

4.2.7. **Skeletal maturity** is of little consequence as whether or not the [proximal humeral epiphysis](#) is closed does not seem to affect the risk of recurrence.<sup>1,34</sup>

4.2.8. **Infection** within the repaired area, **breakdown of repaired tissues**, **damage to nerves or blood vessels**, **chronic pain** and **reduced joint mobility** can all occur and undermine an otherwise good outlook, but such complications are fairly rare now.<sup>1</sup> However a few individuals can be left with reduced shoulder function and continuing instability.

4.2.9. **Degenerative disease** in any joint increases with age, but [osteoarthritis](#) in the shoulder is up to 20% more likely to be diagnosed on X-ray if dislocation has occurred previously.<sup>35</sup> However, it is usually mild or [asymptomatic](#).

4.2.9.1. Long term follow-up studies indicate the [incidence](#) of osteoarthritis to be anything from 15% to over 50% depending on age at first dislocation and length of follow-up.<sup>36,37,38,39</sup>

4.2.9.2. The incidence varies with the techniques used in treatment.<sup>19,36,38,39,40</sup>

4.2.9.3. The number of dislocations that have occurred [correlates](#) with increased severity of osteoarthritis but not with its incidence.<sup>38</sup>

4.2.9.4. Severely [symptomatic](#) osteoarthritis requiring active treatment is rare.

## 5. Summary

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- 5.1. Recurrent dislocation of the shoulder is a common condition usually due to an initial injury but also occurring more easily in people with lax joints. Many factors contribute to the risk of recurrence.
- 5.2. Improvements in surgical techniques, both open and arthroscopic, give most patients a satisfactory prognosis as far as recurrence is concerned.
- 5.3. There is a substantial risk of secondary osteoarthritis shown on X-ray but this is usually mild and asymptomatic.

## **6. Related Synopses**

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Osteoarthritis – General

Traumatic Dislocation of the Hip

## 7. Glossary

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abduction	Movement away from the body.
adduction	Movement towards the body.
acromion	The triangular projection of the spine of the scapula that forms the point of the shoulder.
acromioclavicular joint	The joint between the acromion and the clavicle (collar bone).
anterior	Nearer the front.
anteroposterior	In the direction from anterior to posterior.
arthroscopy	Orthopaedic procedure that involves the introduction of a thin fibre optic device into a joint space to allow direct visualisation of the internal structure. Hence: <i>arthroscopic</i> .
articular	Of, or pertaining to, a joint.
asymptomatic	Without obvious symptoms of disease.
atraumatic	Not resulting from injury.
avulsion	Pulling off.
axillary nerve	One of the main nerves to the arm.
bilateral	Occurring on both sides.
capsulolabral	Pertaining to the tissues forming the edge of the labrum and the ligaments attached to it.
coracoacromial ligaments	Ligaments between the acromion and the coracoid process.
coracohumeral ligaments	Ligaments between the humerus and the coracoid process.
coracoid process	Bony process projecting forwards from the upper part of the scapula (shoulder blade).
correlate	Associate with statistically.
deltoid	Muscle over the outer area of the shoulder.

epiphysis	The part of a long bone from which bone growth occurs. Hence: <i>epiphyseal</i> .
epileptic fit	A disturbance of brain function with episodic loss of consciousness, abnormal uncontrolled movements and/or disturbances of sensation and often accompanied by loss of control of some bodily functions.
external rotation	A movement which rotates the front of the limb outwards, away from the midline.
glenoid fossa	The hollow in the head of the scapula (shoulder blade) that receives the head of the humerus.
humerus	The bone of the upper part of the arm.
incidence	The rate of new occurrence in the population being studied.
inferior	Situated below another structure.
internal rotation	A movement which rotates the front of the limb inward, towards the midline.
labral	Pertaining to the labrum.
labrum (of glenoid fossa)	A ring of fibrocartilage attached to the margin of the glenoid fossa to increase its depth.
lateral	Outer; i.e. away from the midline.
lesion	Discontinuity of tissue or loss of function due to injury or disease.
ligaments	Bands of fibrous tissue that connect bones or cartilages, serving to support and strengthen joints. Hence: <i>ligamentous</i> .
MRI	Magnetic Resonance Imaging, a technique used to image internal structures of the body.
open surgery	An operation done through an incision which exposes the required area.
osteoarthritis	a non-inflammatory joint disease.
posterior	Further back in position, or behind.
proximal	Nearer the point of attachment to the body.

reduction	Correction of displacement.
rehabilitation	Return of function, usually with medical assistance.
rotator cuff	Fibrous part of muscles which stabilise the head of the humerus within the shoulder joint.
scapula	The shoulder blade bone.
stroke	Damage to brain nerve cells due to interrupted blood flow.
subscapularis	One of the deeper muscles of the shoulder.
superior	Situated above another structure.
symptomatic	With symptoms of disease.
traumatic	Resulting from injury.
unilateral	Occurring on one side only.
wasting	Diminishing in bulk and power.

## 8. References

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