

An introduction to

SHOULDER INJURIES

prevention & treatment



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FROM THE EDITOR

If, as somebody once said, the knee was designed when God's attention was distracted, the shoulder was created when He was at the height of his powers. Consider what the shoulder does, and how many athletes – swimmers, tennis players, bowlers, baseball pitchers, javelin throwers – take it for granted. The shoulder can assume no less than 1,600 different positions and, as Dr Simon Kemp points out early in this special report, there is more movement at the shoulder joint than at any other joint in the body. A truly remarkable invention.

Until it goes wrong! I'm not suggesting that God is anything less than infallible, but even He couldn't have anticipated the stress and punishment that the shoulder is subjected to in the modern sports world. And that's where this special report comes in. Prepared by the combined experts of Peak Performance and Sports Injury Bulletin, it looks at every aspect of shoulder care and injury prevention. It starts with an overview on the subject by an eminent physiotherapist, who also includes a number of canny DIY ideas for improving performance and avoiding injury. This is followed by a study of rotator-cuff injuries, the most common cause of shoulder pain, and a number of exercises designed to prevent them. Thereafter, three distinguished surgeons take the shoulder apart, literally, and explain how and why it goes wrong and what you can do about it. And that's not all...! I hope you enjoy this special report and find it useful.



Jonathan A Pye
Publisher

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SHOULDER INJURIES PREVENTION & TREATMENT

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN – ARTICLE ONE

AN OVERVIEW OF THE SHOULDER

The treatment, prevention and performance enhancement advice that follows relates to overuse injuries of the shoulder and not the management of acute or traumatic injuries such as glenohumeral dislocation, clavical fractures, or tears of the labrum (cartilage).

An important tip for athletes is do not wait until your shoulder starts to hurt to do these exercises. "injury prevention equals performance enhancement."

The shoulder joint comprises of four joints: Sternoclavicular (SC) joint, the acromionclavicular (AC) joint, the glenohumeral (GH) joint and the scapulothoracic (ST) joint.

The glenohumeral (GH) is the most susceptible to injury as it is entirely dependent on non-bony connections for integrity.

The GH joint relies on the balance strength and control of muscles, ligaments/capsule and labrum (cartilage) to function properly.

The GH joint has been likened to a seal balancing a ball on its nose because of the challenging task it has to perform.

The rotator cuff muscles comprise of the infraspinatus, supraspinatus, teres minor and subscapularis muscles. This group of muscles are key in enabling us to control and aid the GH joint to perform its balancing act.

The muscles primarily designed to position the scapula for overhead movement are the trapezius (especially lower trapezius) and serratus anterior – called therefore the 'scapular stabilizers'. Counter forces are also produced by levator scapulae, rhomboids and pec minor muscles.

The way to reach balance and control with your shoulder is to work on these five points: think sports specific technique, flexibility, core stability, rotator cuff control, general strength.

SPORTS SPECIFIC TECHNIQUE CAN BE AIDED BY YOUR TRAINER.

■ **Flexibility** – it is important that flexibility allows freedom of movement for the pelvis, trunk, scapula and humerus. For the rotator cuff the critical issue is the balance of forces centring the head of the humerus. It is more critical that the internal and external rotators are equally flexible, rather than how flexible they are.

Warning: to have too much flexibility at the expense of strength and control can be dangerous because of the shear forces causing wear and tear in the joint.

■ **Stretching** – the most important areas for regular flexibility sessions are: infraspinatus/teres minor, pectoralis major/minor, latissimus dorsi, biceps/triceps, thoracic spine, upper trapezius/scalenes/levator scapulae, gentle nerve stretching (oscillations).

The best way to learn how to stretch the above areas is to be taught by a sports physiotherapist, sports therapist or personal trainer.

Core Stability deficiencies are always found with chronic shoulder injuries, or after surgery or trauma, because pain tends to inhibit the postural muscles so they cannot do their job properly

The strength and control of the rotator cuff muscles are dependant on the good positioning of the scapula for effective control.

Therefore with the following exercises it is assumed that the scapula is being held as close as possible to neutral:

- internal/external rotation with arm by side
- internal/external rotation with arm at 90 degrees away from body
- End of range gentle flicks
- Stand facing wall with ball (Swiss or other) held up on wall at head height
- Squeeze tennis ball in hand

Please refer to the full Sports Injury Bulletin Shoulder Report for full instructions on how to carry out these exercises.

General Muscle Strength ('the outer core') must be considered after we have addressed the issues of technique, flexibility, core stability and rotator cuff control.

It is vital to look at the shoulder as only one link in the kinetic chain and using golf as a sport specific example we can understand how the transfer of rotary power starts with a series of wind ups finally being unwound as the stable base of the hips whips back in the opposite direction.

This is why plyometrics is so valuable as it is the exercise science that is concerned with harnessing the eccentric strength of muscles to gain greater power.

SHOULDER INJURIES PREVENTION & TREATMENT

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN –ARTICLE TWO

PREVENTING INJURIES

There is more movement possible at the shoulder joint than at any other joint in the body. Over 1600 positions in three dimensional spaces can be assumed by the shoulder, The price for this is an inherent lack of stability.

As the arm is abducted away from the body or flexed, impingement or squeezing of the rotator cuff and the head of the humerus can occur.

Any overhead activity that involves the arm being taken often enough from below the shoulder level to above shoulder level has the capacity to damage the rotator cuff. With repeated impingement a poorly conditioned rotator cuff can become damaged.

This form of primary impingement is most commonly seen in weight trainers who over emphasise the development of their prime moving muscles at the expense of their rotator cuff.

Secondary impingement refers to impingement secondary to underlying glenohumeral instability, when the rotator cuff is fatigued by its efforts to keep the humerus centred on the glenoid and consequently allows the head of the humerus to ride up, reducing subacromial space.

Secondary impingement is often seen in younger athletes in sports like swimming and throwing.

A strong and healthy rotator cuff is essential to the overhead athlete. They must be able to effectively control the position of their scapula for optimal cuff function.

Keeping increases to training schedule to less than 10% per week will significantly reduce the risk of injury.

Isolated rotator cuff strengthening exercises can be very effective as part of a pre-participation conditioning programme (full details of these can be found in the full Sports Injury Bulletin Shoulder Report).

Strengthening the scapular stabilisers is also needed but this requires expert supervision. However you can perform seated rowing which strengthen latissimus dorsi and should be undertaken while attempting to maintain scapular retraction.

PRACTICAL GUIDELINES TO PREVENT SHOULDER INJURIES

BALANCE YOUR UPPER BODY WORK OUTS

Make sure your upper body strength sessions are balanced. This means that every push or press exercise must be balanced with a pull or row exercise.

This is an example of a balanced upper body exercise plan. Note the 1:1 ratio between push/press and pull/row exercises.

- Bench Press (pectorals, anterior deltoid)
- Seated Row (rhomboids, mid-trapezius, latissimus)
- Flies (pectorals)
- Rear lying prone flies (rhomboids, mid-trapezius, rear deltoid)
- Lateral raises (anterior mid deltoid, upper trapezius)
- Lateral pull down wide grip (latissimus, lower trapezius)

NB// For those who are prone to or recovering from a shoulder injury change the ratio to 2:1 in favour of the non mirror muscles.

LIMIT YOUR RANGE OF MOVEMENT AND TAKE IT EASY

You must progress slowly, this will often mean avoiding certain ranges of motion where the shoulder joint sub-acromial space is compressed the most.

Avoid lateral raises, upright rows and shoulder press completely for a while. However incline bench press with arm abducted to 45 degrees would be a good choice to start again.

During heavy work outs ensure you warm up the shoulder joint and rotator cuff thoroughly prior to lifting

CORRECT SCAPULA POSITIONING

The correct position for the scapula is back and rotated down. To achieve this you need to use your rhomboids, mid and lower trapezius muscles to retract the shoulder and pull the scapula down. A good way to learn this position is during the seated row exercise by keeping your scapula back and down while you move your arms.

Ideally you want to achieve this position during all upper body exercises such as press up or front raise where the shoulder may become impinged will not be painful if you stabilise your scapula correctly.

SPORTS SPECIFIC EXERCISES

Plyometrics for the shoulder usually involves medicine balls of various weights.

Plyometrics exercises have two advantages; First they are performed fast and second they involve stretch shortening cycle movement patterns. Therefore they are much more sport specific.

It is important to ensure that your plyometric workouts are balanced between the prime movers (pectorals, latissimus, anterior deltoid) and the rear-shoulder and upper back muscles.

You can do things like Power Drops (for pectorals, anterior deltoids) and Catch and throw backhands (external rotators). Please refer to the full Sports Injury Bulletin Shoulder Report for full details.

SHOULDER INJURIES PREVENTION & TREATMENT

A SPECIAL REPORT FROM SPORTS INJURY BULLETIN – ARTICLE THREE

SHOULDER EFFICIENCY & SCAPULO-HUMERAL RHYTHM

For the shoulder and arm to move efficiently requires co-ordinated movement of the scapula and humerus. This is known as scapulo-humeral rhythm.

If this scapulo-humeral rhythm is not met, then excess stress will be put on the shoulder joint.

Problems tend to arise when athletes focus their training solely on the prime mover muscles, such as pectorals and deltoids. This can result in relative weakness of the rotator-cuff and scapula stabiliser muscles.

Therefore the best programme will be one that promotes strength in all muscles groups and develops a balanced physique, front and back.

SCAPULAR DYSKINESIS

Recent research by Kibler and McMullen uses the concept of 'scapular dyskinesis': an alteration in the normal position or motion of the scapula during coupled scapulo-humeral movements. They suggest that a variety of symptoms share the same biomechanical fault – the inhibition or disorganisation of activation patterns in scapular stabilising muscles, leading to altered scapular function.

More research by Cools (from Belgium) supports this theory leading us to understand that incorrect muscle function (developed through sport specific demands or injury) is most evident in the lower and middle trapezius and lateral rotator-cuff muscles.

Due to this fact we can see that over head athletes and people involved in weight training need to spend time on specific strengthening exercises to promote injury prevention and ensure balanced strength and good posture.

PRE-HAB FOR BALANCED STRENGTH AND GOOD POSTURE

The following pre-hab outlines how to promote balanced strength and good posture in areas discussed above: For full details of this programme please refer to the Sports Injury Bulletin Shoulder Injury Special Report.

STEP 1. EQUALISE FRONT AND REAR STRENGTH

Opposing muscle groups must be trained equally. The best approach is to programme exercise pairs that work opposing muscles (table 1 below)

TABLE 1: FRONT AND REAR SHOULDER EXERCISE PAIRS

Press or Push Exercise	Opposing Pull or Row Exercise
Bench Press	Bench Pull or Seated Row
Dumbbell Press	Single Arm Row
Shoulder Press	Lat Pulldown
Flyes	Prone Flyes or Bent-Over Lateral Raise
Lateral Raises	Cable Lateral Pull Downs

Coaches and therapists should check that equal number of sets from each column are written into strength programmes.

STEP 2: DEVELOP GOOD PULLING FORM

It is essential to perform pull or row exercises with correct technique in order to ensure that the middle trapezius rhomboids and lower trapezius muscles are properly recruited.

The same coaching principle applies to rowing exercises. Exercisers should focus on retracting the scapula at the same time as the elbow is pulled back and keeping the scapula retracted as the arm goes forwards with the weight on the return movement. Do not perform this exercise with rounded shoulders as this will again result in poor shoulder joint mechanics.

STEP 3: ISOLATE THE ROTATOR CUFF

The small but crucial muscles of the rotator cuff should be targeted alongside the lower traps to avoid developing dysfunction or weakness. Please refer to full Peak Performance report for the coaching tips.

EXERCISE 1.

■ Internal shoulder rotation

Muscles Targeted – Subscapularis and pectoralis minor, the shoulder's medial rotators.

EXERCISE 2:

■ External shoulder rotation – Use resistance band or pulley machine

Muscles Targeted – Infraspinatus and teres minor, the shoulder's external rotators

EXERCISE 3:

■ Side lying raise – This exercise is particularly effective at recruiting rotator cuff muscles while avoiding putting the shoulder joint through stressful range of motion.

Muscles Targeted – Supraspinatus (top of rotator cuff), assisted by the deltoid and infraspinatus.

EXERCISE 4:

■ Human Arrow – This exercise may take time to learn

Muscles Targeted – Lower trapezius, focusing on scapular depression.

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SHOULDER INJURIES: PREVENTION AND TREATMENT – FREE DELIVERY WORLDWIDE

"Extremely useful! I've not been able to use it as much as I would have liked because I made the mistake of lending it to one of the rugby players at the club and it is now making it's way around the team. Keep up the good work!" – Charmaine Johns, Physio

There is perhaps no joint in the human body as complex, fascinating, or baffling as the shoulder. It can leave clinicians scratching their heads, wondering why a problem they have solved many times before is so stubborn.

And shoulder problems can certainly be stubborn! That's why, in every case, prevention is so much better than cure. Rarely is a pain that has surfaced a simple matter of applying some ice – it is more likely to be the tip of an iceberg...

This is a groundbreaking book in more ways than one. I was surprised to discover so many shoulder problems are due not only to bad habits of technique, but to the unbalanced upper-body workouts many athletes undertake in the mistaken belief they are doing themselves good.

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For these poor souls, injury and pain lie just around the corner. Read on to find if you are among them! Shoulder Injuries – Prevention and Treatment is a ground-breaking book from Peak Performance for all athletes who rely on their shoulders. You can get this great training guide for 33% off the recommended retail price of \$59.99! You pay only \$39.99! Prepared by the combined experts of Peak Performance and Sports Injury Bulletin, it looks at every aspect of shoulder care and injury prevention:

- Shoulder overview: the five main ingredients for keeping shoulders injury-free
- Rotator-cuff protection: a specialist in treating sports injuries explains how overhead athletes can prevent chronic shoulder pain
- Preventing injuries: a sports fitness expert suggests further exercises to help you avoid shoulder pain
- A surgical view: an orthopaedic surgeon explains why shoulders go wrong and what can be done to repair them
- Case study: how a keen club golfer was cured of a nagging shoulder pain
- Technical review: two surgeons discuss the diagnosis and treatment of acromioclavicular injuries in athletes
- Prehab guide: an assessment of the latest research into shoulder problems and with practical advice on achieving balanced upper-body development

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