

Exercise and Shoulder Pain

Introduction

The human shoulder is an intricate system of bones, joints, connective tissues and muscles that place the arm and hand in a position that allows them to function. It derives its stability from a group of four small muscles (known as the rotator cuff) and another five muscles that stabilize the scapula (shoulder blade) and guide the entire shoulder joint along the rib cage during arm motions. Some experts state that the upper extremities can assume more than 1,600 positions in three-dimensional space at the shoulder joint. When working properly, the shoulder makes activities like throwing, hammering, shoveling, raking, painting, climbing, lifting, swimming and waving possible. A painful shoulder can make routine activities like brushing your teeth, bathing, dressing, sleeping, and combing your hair extremely difficult.

Chronic shoulder pain (lasting more than a few weeks to a few months or more) is the most common upper extremity problem in recreational and professional athletes. According to the Centers for Disease Control and Prevention (CDC), approximately 13.7 million Americans sought medical care for shoulder pain in 2003 alone.

Shoulder Structure

The shoulder is a ball-and-socket joint and sacrifices some of the stability afforded the hip joint for a higher level of mobility. It lacks a deep socket; instead, the ball-shaped humeral (arm bone) head sits or adjoins a shallow, saucer-like socket (glenoid fossa), located slightly to the front and side surface of your shoulder blade. The structural arrangement of the shoulder joint contributes to its highly mobile and fairly unstable status. Because the head (ball) of the humerus (arm bone) is two-thirds larger than the glenoid fossa (the narrow socket), the shoulder resembles a golf ball on a tee.

Shoulder Function

Raising your arm overhead requires a fine blend of shoulder mobility with dynamic stability. Adequate strength and endurance of both the rotator cuff and shoulder blade stabilizing muscles (trapezius, levator scapula, rhomboids, pectoralis major and serratus anterior) is essential. Although each of the "rotator cuff" muscles has a separate function in isolation, together they enable the shoulder joint to produce its numerous characteristic motions while maintaining a balance between mobility and stability. The four rotator cuff muscles (supraspinatus, infraspinatus, teres minor and subscapularis) work in concert to allow the arm relatively free movement in numerous positions while pulling your humeral head (the ball) downward and inward within the glenoid fossa (socket).

The scapula must move with the humeral head (the ball) in order to maintain a mobile yet supportive base for the rotator cuff muscles to function within. Good posture, muscle strength and endurance and proper exercise selection and technique can all contribute to enhanced shoulder stability and function. Poor posture (forward head with rounded shoulders and upper back), failure of stabilizing muscles, overuse of specific exercises, muscle strength and flexibility imbalances and improper exercise technique can all contribute to shoulder pain and injury during overhead arm and shoulder movements.



Common Sources of Shoulder Pain

Common disorders contributing to shoulder pain include:

- Arthritis: A degenerative process causing pain, swelling, stiffness, and disability
- Fractures: A break in a bone
- Dislocations/subluxations: Complete or partial separation of bones within the joint
- Sprains: Stretch/damage to ligaments and connective tissue within the joint
- Frozen Shoulder: Stiffness & loss of movement; a tight connective joint capsule
- Diabetic Complications: Can cause frozen shoulder
- Rotator Cuff Tendonitis: Irritation and swelling of tendons of rotator cuff muscles
- Impingement: Compression/abrasion of rotator cuff tendons by bony and ligamentous structures
- Rotator Cuff Tears: Partial or full-thickness tears in the tendons connecting the rotator cuff muscles to part of the humeral head (the ball portion of the joint)

Exercise Precautions for Individuals with Shoulder Pain

Individuals with ongoing shoulder pain should avoid exercising the painful limb and should seek immediate medical attention. They should select other forms of exercise to maintain their physical fitness without using their painful shoulder. Shoulder pain lasting more than a week should be checked by a physician or qualified medical professional. Exercises or movements that cause pain should be avoided and new pain should be reported to a physician. Individuals who have successfully completed rehabilitation should be medically cleared to perform upper extremity exercises and should seek exercise guidelines from their healthcare professional(s). You should not try to “exercise through the pain.” The Arthritis Foundation cautions people to avoid exercise/activities that cause increased pain lasting an hour or more after exercise. Seek guidance from a qualified exercise professional.

The American College of Sports Medicine’s certification credentials recognize exercise professionals demonstrating high levels of competence in exercise plan development and supervision. They can help you develop a balanced exercise program to enhance your physical fitness and help you make sound exercise selections.

Common Exercise-Related Shoulder Injuries

Common injuries to the shoulder include rotator cuff impingement (squeezing and abrasion of tendons beneath joint structures and surfaces), rotator cuff tendonitis (inflammation, pain and swelling), and rotator cuff tears (either partial or complete tears of the rotator cuff tendons). These injuries are most common in people over the age of 40 . Shoulder (scapular) instability (excessive motion) is found in 68 percent of individuals with rotator cuff problems. Factors leading to rotator cuff impingement tendonitis and tears include:

- Sudden trauma: A fall on the shoulder or arm
- Repetitive microtrauma: Overuse of overhead activities with improper form
- Poor posture: Round shoulders, forward head and rounded upper back; rotator cuff and scapular stabilizing muscle fatigue and weakness and muscle imbalances; changes or variations in shoulder anatomy
- Connective tissue (capsular tightness or looseness)
- Improper exercise selection and technique



Strategies to Enhance Shoulder Stability and Function

Shoulder stability and function can be enhanced by practicing good posture, maintaining a balance of flexibility and strength in all shoulder muscles, and selecting appropriate exercises and performing them correctly. Pressing the chest out while pulling the bottom of the shoulder blades and elbows downward (towards the back pockets) and together can help improve shoulder stability and function. Hold this position for a count of five, release and repeat it as tolerated throughout the day. The following exercises are often considered “contraindicated” for people with swollen and irritated shoulders:

- Shoulder (overhead) presses
- Dumbbell side raises with thumbs pointing down
- Upright rows above shoulder height
- Incline bench press
- Lateral pull-downs behind the neck

Some preventative shoulder exercise modifications may include:

- Shoulder press: Keep bar/dumbbells slightly in front of shoulders and above ear level.
- Bench press: Keep bar a few inches above chest when lowering and keep arms close to the body.
- Pectoral Chest Fly Machine: Keep arms slightly in front of the shoulder and body when lowering the weights. Do not try to stretch your arms below your torso level.
- Lateral pull-down: Pull bar down in front of head and use an underhand grip.

Summary

Rotator cuff injuries are the most common upper-extremity problem experienced by recreational and professional athletes. They can be painful and debilitating, yet are often preventable. Good posture, proper exercise selection and technique, and consultation with an exercise professional are all strategies that can enhance shoulder stability and function. Exercise-related pain that limits shoulder function should be reported to a physician immediately. Previously injured exercisers should get medical clearance from their physician and/or physical therapist before starting a new exercise program. Recurring pain warrants cessation of exercise and medical follow-up.

Written for the American College of Sports Medicine
By Peter Ronai, M.S., RCEP

