

# **Investigation 3.7**

**3.7A: Shoulder Pain**

**3.7B: Joints**

## Investigation

# 3.7A: Shoulder Pain

When your staff schedules an appointment they ask the patient the nature of the problem and estimate the amount of time you will need to deal with the issues. Most of your appointments involve a sickness, but sometimes an injury prompts the visit.

Physicians commonly classify an injury according to the duration of symptoms as acute, sub-acute, or chronic. **Acute** injuries occurred very recently, usually in the past few days. An athlete visiting you because he or she injured an ankle playing volleyball yesterday is experiencing an acute injury. **Sub-acute** injuries occurred less recently, perhaps from a few weeks up to a couple months ago. We classify injuries as **chronic** when they occurred months ago, but still produce **symptoms**. The duration of symptoms impacts the strategy for assessment and care. Acute injuries commonly require more diagnostics tests, while sub-acute and chronic injuries dictate a great focus on therapy **modalities**. All injuries begin as acute injuries; for acute injuries you hope to heal the injury to avoid sub-acute or chronic symptoms.

Chief Complaint: George is a 67 year old male with a chief complaint of right shoulder pain.

History of Chief Complaint:

George reports his pain has been present for at least six months. He does not recall a specific injury that **precipitated** the pain. The pain started as mild and **intermittent** in the right shoulder area, but for the past two months it has become almost constant during his waking hours and occasionally severe on movement of the shoulder. To get relief he takes an over-the-counter **anti-inflammatory** medication once or twice every three days. However, the pain keeps coming back.

When you ask George to describe the pain, he says he feels it mostly at the top of the shoulder, but sometimes he notices pain also at the front or back of the shoulder. Sometimes he gets temporary relief by pressing on the back of his shoulder. He describes the pain occasionally as very intense for a short period of time, up to 9/10 on the **pain scale**. His pain makes it difficult to shave, brush his teeth, and hold a full glass of water. He definitely feels pain and also feels some weakness. He experiences pain when he lies down to sleep, having great difficulty finding a comfortable position for his shoulder.

George has retired from a career as a salesman. His sales position did not include heavy lifting. His current exercise comes from walking, but he enjoyed playing baseball until the age of 54. Indeed George reports he had quite a reputation on the mound as a strong right-handed pitcher. He still enjoys bowling on occasion, again right-handed.

George reports his past medical history includes surgeries for **appendicitis** at age 14 and removal of a **cyst** from his left wrist about age 37. George has been taking medications for **hypertension** and borderline **diabetes** for several years. He is right side **dominant**, as noted above.

**Current Medications:**

Metformin 400 mg **Bid**

Lisinopril 20 mg **QD**

Naproxen Sodium 220 mg BID **prn**

**Examination:**

Temperature: 98.6 F.

Blood Pressure: 145/82

Head and Neck: within normal limits

Heart and Lungs: within normal limits

Abdomen: within normal limits

Upper Extremities: left and right muscular and **osseous symmetry**. Right shoulder tender to **palpation anterior, posterior, superior and lateral** areas. **Mobilization** of right shoulder joint **elicits crepitus** and a complaint of increased discomfort. **Splinting** and weakness to **resistance tests** in all **parameters** noted in right shoulder only. Shoulder is stable. No **edema** or **erythema** observed. Left shoulder within normal limits. Normal lower extremities.

**Investigation 3.7A: Shoulder Pain**

Dr.: \_\_\_\_\_

Worksheet 3.7A1

P.: \_\_\_\_\_ Date: \_\_\_\_\_

**Use the information George provided in the medical interview to complete the first part of his medical record located below.**

**Medical Record**

Patient: \_\_\_\_\_

Doctor: \_\_\_\_\_

Chief Complaint: \_\_\_\_\_

Hx of CC: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Current and Past Medical Hx: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Current Medications: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Surgical Hx: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Positive Exam Findings: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Below is the list of possible causes of George’s shoulder pain. You can see there are too many possible causes for you to test for every single one. Besides, George would be very unhappy with you if you allowed him to suffer while you worked your way through the entire list. The Differential Diagnosis for Shoulder Pain according to the Mayo Clinic<sup>1</sup> is:

- Avascular necrosis
- Brachial plexus injury
- Broken arm
- Bursitis
- Cervical radiculopathy
- Dislocated shoulder
- Frozen shoulder
- Heart attack
- Impingement
- Sprains and strains
- Osteoarthritis
- Polymyalgia rheumatica
- Rheumatoid arthritis
- Rotator cuff injury
- Separated shoulder
- Septic arthritis
- Tendinitis
- Tendon rupture
- Thoracic outlet syndrome
- Torn cartilage

Reference:

<sup>1</sup><http://www.mayoclinic.org/symptoms/shoulder-pain/basics/causes/sym-20050696>

As George’s physician, you must consider every possible cause on the list. However, you feel you can help George more if you rule out the least likely causes right away and quickly arrive at a “**working differential diagnosis**” of the most likely causes. In order to eliminate unlikely causes of George’s shoulder pain you will compare what George told you about his symptoms and your examination findings to the **Differential Diagnosis Versus Symptom Chart** on the next page; the chart indicates which symptoms are more likely to occur in each of the possible causes. Match up as many of George’s symptoms to the potential disorders to shorten your differential diagnosis down to the three or four most likely causes. **Write your choices below:**

Differential Diagnosis:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

\*\*\*This page needs to be in Landscape Orientation\*\*\* see attached file



Once you reduce your differential diagnosis to a manageable number of possibilities you are ready to consider which tests might help you make your final diagnosis. You have available tests to analyze blood, **x-rays** to look inside the body at bones and joints, **Magnetic Resonance Imaging** (MRI) to evaluate soft tissue structures such as muscles, ligaments, and cartilage. **Computerize Tomography** (CT Scan) is a special X-Ray test that can provide clearer definition of internal anatomy when faced with a difficult diagnostic problem.

When you consider which test you will order first you must also consider how much each test costs. A blood test can range from inexpensive to expensive, depending on the type of information you request. Plain X-ray images are much less expensive than an MRI. An MRI or CT Scan may cost well over \$1000. We must always compare the expense versus the helpfulness of the test in reaching a diagnosis.

You will also want to consider the effect on the patient when deciding what test to order. For example, the effect on the body from X-rays accumulates with every x-ray ordered. The risk of developing a cancer from exposure to x-ray radiation increases a little with each x-ray exposure in their lifetime. CT scans utilize large amounts of x-ray radiation. A CT scan on the chest, for example, requires about 15 times the radiation exposure needed for a plain chest x-ray. **Nerve Conduction Velocity tests** of peripheral nerves are expensive and uncomfortable for the patient.

Because of the costs and risks, you have a responsibility to order only those tests that are truly necessary to assist you in making the correct diagnosis.

**Tests:** Which tests do you want to order for George? Number the tests in order from most useful to least important for your assessment of George's shoulder (leave blank the space next to tests you do not need):

- |  |   |
|--|---|
| <input type="checkbox"/> Complete blood count      | <input type="checkbox"/> Muscle Grip Strength Testing |
| <input type="checkbox"/> x-rays of right shoulder  | <input type="checkbox"/> Nerve Conduction Velocity    |
| <input type="checkbox"/> X-rays of cervical spine  |   |
| <input type="checkbox"/> X-rays of lumbar spine    |   |
| <input type="checkbox"/> MRI of right shoulder     |   |
| <input type="checkbox"/> CT Scan of right shoulder |   |

The following chart contains the results you would receive for each test you selected for George . Just for fun see if the tests you did not select would have been helpful.

Test	Results
Complete Blood Count	All findings within normal limits
x-rays of right shoulder	Severe degenerative changes within the shoulder joint with spurring
x-rays of cervical spine	Mild degenerative changes
x-rays of the lumbar spine	No herniation or degenerative changes
MRI right shoulder	Severe degenerative joint changes
CT Scan right shoulder	Severe degenerative joint changes
Muscle Grip Strength Testing	Weakness in right hand vs left hand
Nerve Conduction Velocity Test	Within normal limits

Summarize the results for the tests you ordered as if you are explaining to George how you figured out the cause of his pain.

Test Results: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Diagnosis: \_\_\_\_\_  
\_\_\_\_\_

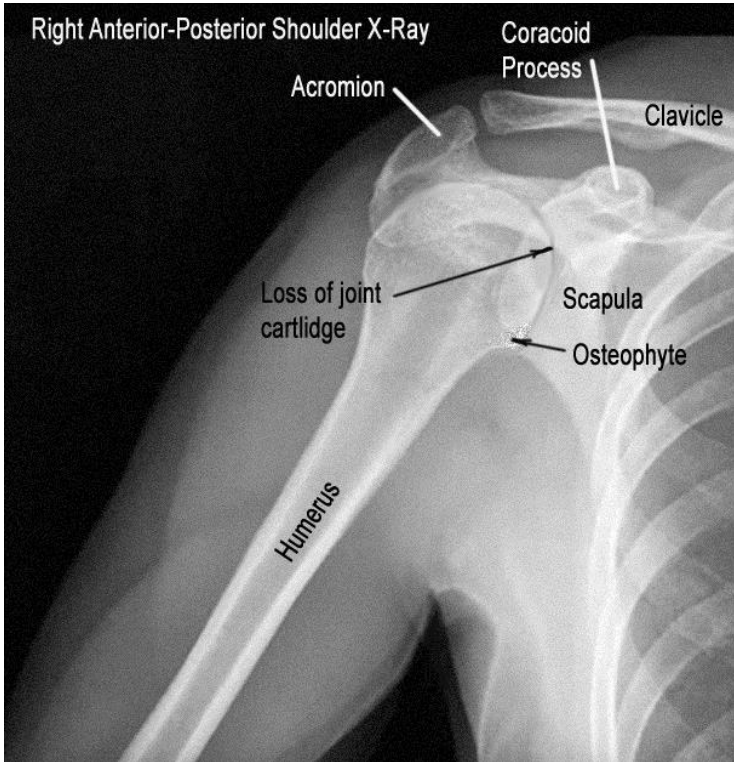
Treatment Plan: (look up at least three possible treatments for your diagnosis)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





The x-ray on the left demonstrates a normal shoulder joint from one perspective. A complete shoulder x-ray would include three views: AP, LAT, & Oblique

X-ray of normal right shoulder



The adjacent x-ray demonstrates degenerative arthritis of the shoulder joint. Note the diminished space between the head of the humerus and the glenoid fossa of the scapula when compared to the normal x-ray.

Injuries to bones and joints are often referred to Orthopedic Surgeons for further evaluation and treatment; they specialize in the treatment of injuries and diseases affecting the bones and joints. Orthopedists are the “carpenters of the medical community” who treat patients of all ages with problems with their “skeletal scaffolding”. Children might injure bones and joints when they fall off their skateboard or bicycle. Unfortunately some people are born with bone deformities that require treatment, so-called congenital deformities. Teenagers and young adults may sometimes think they are invincible, driving cars erratically, inviting a crash or getting into fights. Sports injuries can occur even when taking all appropriate precautions. Adults sometimes suffer work related injuries or have accidents. Elderly patients’ joints can wear out and require replacement. Almost everyone needs an Orthopedist somewhere along his or her life’s journey.

Orthopedic Surgery has several sub-specialties to include surgeons who focus exclusively on the spine, hand, shoulder, hip, lower leg and foot, even non-surgical orthopedic treatments and rehabilitation. Orthopedists who have not completed a fellowship in a sub-specialty are considered General Orthopedists; they treat basic bone or joint problems of a more routine nature. Sub-specialists use their advanced training to manage more complex orthopedic problems referred to them for care.

We can see a good example of orthopedic sub-specialization in the world of professional baseball. Pitchers at that level throwing thousands of baseballs at high velocity are prone to two particular career-limiting injuries: (1) tears of the rotator cuff and labrum of the shoulder and (2) tearing of the ligaments of the elbow. A Major League baseball team would insist their pitcher with the shoulder injury receive treatment from a surgeon who works exclusively on sports injuries to elbow ligaments. Medicine is very specialized in this modern age, where amazingly complex procedures can literally rebuild the injured structure.

Not all patients referred to Orthopedic Surgeons require surgery. In fact, Orthopedists generally reserve surgery as a last resort only recommended when conservative treatments such as rest, medication, therapeutic injections, and physical therapy have failed to resolve pain and restore function. All surgery has a risk of failure or infection and should receive careful and informed consideration. Surgeons themselves often define major surgery as “any surgery done on me”.

Orthopedists have an extensive arsenal of options available when surgery becomes necessary. A partial list of procedures often performed by Orthopedists include:

1. Closed reduction of a displaced fracture
2. Open reduction of a displaced fracture
3. Excision and curettage of infected bone and tissue
4. Bone Biopsy of suspected bone cancer
5. Reattachment of torn muscles or ligaments
6. Total joint replacement for arthritis of shoulder, hip, knee, or ankle
7. Repair of torn rotator cuff of shoulder
8. Ligament replacement in elbow
9. Arthroscopic surgery of knee
10. Ligament replacement of knee
11. Spinal Fusion

Non-surgical orthopedic treatments include application of casts, injections of local anesthetics and steroids, physical mobilization or traction therapy, prescribing oral medications, and many more.

With so many people participating in sports, injured in car accidents, and suffering diseases **afflicting** joints and bones, orthopedists are, indeed, very busy physicians. Orthopedic medicine continues to develop highly technical treatments for orthopedic problems. It is nearly impossible for a single orthopedist to become proficient in all areas of this constantly expanding specialty. Perhaps the value of sub-specialization makes more sense to you now.