

## MUSCULOSKELETAL EXAM

### I. MUSCULOSKELETAL DISEASE

#### A. **Magnitude**

Over 37 million people in the United States suffer from one or another form of arthritis or related condition. It represents one of the five leading problems in patients presenting to the primary care physician.

#### B. **Rheumatology**

This is the branch of medicine dealing with arthritis and related disorders of the musculoskeletal system including the multi system autoimmune diseases.

Rheumatologists are medical specialists in musculoskeletal disease.

#### C. **Value of the History and Physical**

The history and physical are critical to arriving at an accurate diagnosis of musculoskeletal disorders. Although the same might be said for all systems, it is particularly true in this area.

In the diagnosis of musculoskeletal disease, 70% of the weight might be placed on the history, 20% on the physical and 10% on laboratory data.

### II. TERMS-YOU SHOULD BE FAMILIAR WITH

- A. **Arthralgia:** Pain in the joint.
- B. **Arthritis:** Inflammation of the joint. Implies presence of warmth, swelling, heat, tenderness and possibly erythema.
- C. **Baker's cyst:** A synovial cyst found in the popliteal space, which may occasionally rupture into the calf and mimic thrombophlebitis.
- D. **Bouchard's nodes:** Bony enlargement of the proximal interphalangeal joints found in osteoarthritis.
- E. **Boutonniere deformity:** A characteristic deformity found in rheumatoid arthritis, which includes a flexion contracture of the proximal phalangeal, joint associated with hyperextension of the distal interphalangeal joint.
- F. **Bursitis:** Inflammation of a bursa, which is a synovial lined sac, which may or may not be in communication with a joint cavity.
- G. **Crepitation:** A palpable or audible grating or crunching sensation produced by motion of a joint or tendon.
- H. **Diarthrodial joint:** A freely movable joint lined by synovium.
- I. **Ganglion:** Cystic enlargement arising from joint capsules and tendon sheaths, most common\* located on the dorsum of the wrist
- J. **Hallux vagus:** Abnormal abduction of the great toe in relation to the first metatarsal. When the head of the first metatarsal subsequently enlarges on its medial side, a bunion deformity is created.
- K. **Hammer toe:** A common toe deformity characterized by hyperextension at the metatarsophalangeal joint, flexion at the proximal interphalangeal joint.
- L. **Heberden's node:** Bony enlargements of the distal interphalangeal joint of the hand secondary to osteoarthritis.

- M. **Kyphosis:** Rounded thoracic convexity of the spine often seen in older women.
- N. **Myalgia:** Pain in muscle.
- O. **Podagra:** Acute of the first metatarsal phalangeal joint and often the calling card of gout.
- P. **Rheumatoid nodule:** A subcutaneous or subperiosteal nodule with a characteristic histology often found on the extensor surface of the forearm and elbow and seen in about 20% of patients with rheumatoid arthritis.
- Q. **Scoliosis:** A lateral curvature of the spine.
- R. **Synovitis:** Inflammation of the lining tissue of a diarthrodial joint. It results in the palpable swelling of joints found in diseases like rheumatoid arthritis. An examiner will properly note the presence or absence of "palpable synovitis".
- S. **Swan neck deformity:** A characteristic hand deformity in rheumatoid arthritis in which there is a flexion contracture of the metacarpalphalangeal joint, hyperextension of the proximal interphalangeal joint and flexion of the distal interphalangeal joint. It may be found in other types of arthritis.
- T. **Tophus:** A collection of monosodium urate crystals, which may be palpated beneath the skin.
- U. **Ulnar deviation:** Another common deformity in rheumatoid arthritis in which the fingers drift inward at the MCP joints.

### III. RECORDING THE MUSCULOSKELETAL EXAM

A musculoskeletal exam nearly exclusively relies on inspection and palpation of the joints and some specialized tests involving those techniques. Rarely do percussion and auscultation play a role in the musculoskeletal exam. The key features to note and record on the examination of the joints are **S**welling, **T**enderness and **L**oss of motion.

Other important physical signs including temperature and color changes over the joint, crepitation and deformity can be added to complement the basic **STL** data

**Rating:** Swelling, tenderness and loss of motion can be graded conveniently on a scale of 0-4. In general terms, 0 means normal, 1 a mild abnormality, 2 moderate, 3 marked and 4 maximum abnormality. A more detailed explanation of the grading system is presented in the following table.

#### THE MUSCULOSKELETAL EXAM

	<b>S0</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>
Swelling (S)	No Swelling	Joint swelling which may not be apparent on casual inspection, but should be recognizable to an experienced examiner	Joint swelling obvious even on casual observation	Markedly abnormal swelling	Joint swelling to a maximally abnormal degree
	<b>T0</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>
Tenderness (T)	No Tenderness	Slight or mild tolerable discomfort on palpation	More severe pain on ordinary palpation, which the patient prefers not to tolerate	More intolerable pain even with light palpation or pressure	Pain which may be caused by even a mild stimulus such as a sheet touching the joint often characteristic of acute gout
	<b>L0</b>	<b>L1</b>	<b>L2</b>	<b>L3</b>	<b>L4</b>
Limitation of motion (L)	Normal joint motion	About 25% loss of motion	About 50% loss of motion	About 75% loss of motion	100% loss of motion or complete ankyloses of the joint

**Fist grading:** Motion in small joints of the fingers can be specifically measured in each case, but this represents a time consuming exercise that is usually not critical to patient management. A good global assessment of joint motion in the hands can be achieved by asking the patient to make a fist and assessing the degree to which that functional activity is impaired. A normal complete fist produced by complete flexion of all the fingers is described as 100% fist, and a flat hand with no flexion is a 0%. In between these two extremes, one can estimate 25%, 50% and 75% fists.

A rheumatologist caring for a patient with polyarticular joint disease can benefit from the use of this semi-quantitative shorthand in following the course of the patient. The following example of a recorded examination of a patient with rheumatoid arthritis demonstrates the usefulness of this method in providing an easy to read summary of the joint exam.

**EXAMPLE: Rheumatoid Arthritis Patient**

	<b>RIGHT</b>	<b>LEFT</b>
<b>TMJ</b>	<b>0</b>	<b>0</b>
<b>Shoulder</b>	<b>S<sub>0</sub>T<sub>1</sub>L<sub>70</sub><sup>o</sup><sub>abd</sub></b>	<b>S<sub>0</sub>T<sub>1</sub>L<sub>0</sub></b>
<b>Elbow</b>	<b>S<sub>0</sub>T<sub>0</sub>L<sub>10-100</sub></b>	<b>S<sub>1</sub>T<sub>1</sub>L<sub>0</sub></b>
<b>Wrist</b>	<b>S<sub>1</sub>T<sub>1</sub>L<sub>1</sub></b>	<b>S<sub>1</sub>T<sub>2</sub>L<sub>1</sub></b>
<b>MCP</b>	<b>2, 3S<sub>1</sub>T<sub>1</sub></b>	<b>2, 4S<sub>1</sub>T<sub>1</sub></b>
<b>PIP</b>	<b>3, 4S<sub>1</sub>T<sub>1</sub></b>	<b>3, 4S<sub>1</sub>T<sub>1</sub></b>
<b>DIP</b>	<b>0</b>	<b>0</b>
<b>Fist</b>	<b>75%</b>	<b>75%</b>
<b>Hip</b>	<b>L<sub>0</sub></b>	<b>L<sub>0</sub></b>
<b>Knee</b>	<b>S<sub>1</sub>T<sub>1</sub>L<sub>0-95</sub></b>	<b>S<sub>1</sub>T<sub>0</sub>L<sub>0-100</sub></b>
<b>Ankle</b>	<b>0</b>	<b>0</b>
<b>MTP</b>	<b>2, 3S<sub>1</sub>T<sub>2</sub></b>	<b>2, 3, 4S<sub>1</sub>T<sub>2</sub></b>

## I. EXAMINATION OF THE JOINTS

- A. Specific information regarding joint anatomy, technique and range of motion can be found in Chapter 17 of Bates entitled, "The Musculoskeletal System".
- B. In general, all joints above the waist are examined with the patient in the sitting position while joints below the waist are examined with the patient supine. Consistency in performance of the joint exam is more important than any specific method.
- C. If you forget range of motion for a given joint, you can refresh yourself by performing active range of motion on your own joints (presuming that range of motion of your joints is normal.)

- D. When noting swelling about the joints, always attempt to delineate periarticular and bursal swelling from synovitis.
- E. Minor joint abnormalities may be more apparent when compared to the same joint on the contralateral side.

## II. COMMON SYNDROMES TO KNOW ABOUT AND SPECIAL SIGNS

- A. Carpal Tunnel Syndrome  
(compression of median nerve within the carpal canal)  
  
Phalen's Test/Tinel's Sign
- B. Low Back Pain with Radiation to the Leg  
  
(Straight Leg Raising Sign [SLR])
- C. Impingement Syndrome (Rotator Cuff Tendinitis)
- D. Lateral Epicondylitis (Tennis Elbow)
- E. Medial Epicondylitis (Golf Elbow)
- F. Patello-femoral syndrome--clicking on extension of lower leg
- G. Fibromyalgia--trigger points and sleep disturbance
- H. Ruptured Baker's Cyst---mimics DVT
- I. "Lax Ligament" syndrome