1. Which of the following meniscal tears has the best prognosis?
A. horizontal
B. radial
C. peripheral
D. oblique

Reference:

2. Partial tears of the anterior cruciate ligament:
A. are more common than complete tears
B. are challenging to diagnose clinically
C. do not require surgical reconstruction
D. are usually associated with bone contusions in the lateral compartment

Reference:

3. Patellofemoral pathology:
A. typically results in lateral knee pain
B. is usually the result of prior trauma
C. is best evaluated on axial MR images
D. often results in tears of the lateral patellofemoral ligament

Reference:

4. The primary stabilizing ligament of the patella is:
A. the medial collateral ligament.
B. the medial patellotibial ligament.
C. the lateral patellofemoral ligament.
D. the medial patellofemoral ligament.

Reference:

5. Injuries to the structures of the posterolateral corner of the knee are:
A. rarely associated with injuries to other ligaments.
B. a potential cause for a failed cruciate graft if undiagnosed.
C. repaired after associated soft tissue swelling has resolved.
D. easily recognized on physical examination.

Reference:
6. Osteochondritis dissecans (OCD) of the knee in a skeletally immature patient:
A. involves both knees in about 40% of cases.
B. tends to result in loose bodies.
C. typically affects children before the age of 10 years.
D. has a better prognosis than in an adult.

References

7. A meniscal ossicle:
A. most commonly occurs in the posterior horn of the lateral meniscus.
B. often migrates within the knee like other loose bodies.
C. may or may not contain marrow fat.
D. is most easily recognized on axial MR images.

Reference

8. Normal structures that may simulate a meniscal tear or a displaced meniscal fragment on MR imaging include all of the following except the:
A. transverse intermeniscal ligament.
B. sagittal meniscomeniscal ligament.
C. anterior arm of the semimembranosus tendon.
D. meniscofemoral ligaments.

Reference

9. A discoid meniscus
A. is most common laterally
B. is less prone to tear
C. is most easily diagnosed on axial images
D. demonstrates too few “bow ties” on sagittal images

Reference

10. A bucket handle tear
A. most commonly involves the lateral meniscus
B. results from a radial tear
C. may result in a “double ACL” sign
D. may not demonstrate a displaced fragment at MR imaging

Reference

11. A “cyclops” lesion:
A. is often asymptomatic
B. is a complication of PCL reconstruction
C. refers to scar tissue in the posterior intercondylar notch
D. may restrict flexion of the knee

Reference

12. The most common plica in the knee is the:
   A. infrapatellar plica
   B. medial patellar plica
   C. suprapatellar plica
   D. lateral patellar plica

Reference

13. A bipartite patella
   A. most commonly involves its upper inner quadrant
   B. is an asymptomatic normal variant
   C. may mimic a fracture on radiographs
   D. is best demonstrated on sagittal images

Reference

14. Regarding the root attachments of the menisci:
   A. the medial anterior root attaches near the distal ACL
   B. the lateral anterior root attaches along the anterior margin of the lateral tibial plateau
   C. the medial posterior root attaches adjacent to the distal PCL
   D. the lateral posterior root attaches adjacent to the popliteus tendon

Reference

15. Horizontal meniscal tears are:
   A. most common in younger patients
   B. often asymptomatic
   C. not associated with meniscal cysts
   D. commonly associated with ACL tears

Reference
Zanetti M, Pfirrmann CWA, Schmid MR, et. al. Patients with suspected meniscal tears: prevalence of abnormalities seen on MRI of 100 symptomatic and 100 contralateral asymptomatic knees. AJR 2003;181:635-641

SAM Questions for HIP MRI (5 questions = 1 hour)
Target Audience: This self-assessment module is intended for radiologists in either a general academic group or in private practice.
Learning Objectives:
At the completion of this exercise, the participant will be able to:
1. identify ITOH on MRI.
2. recognize labral tears of the acetabulum.
3. appreciate the shortcomings of measurements for FAI of the hip.

Self-Assessment Questions
1. Avascular necrosis of the femoral head is best diagnosed on MRI by which of the following:
A. High T2 signal indicating edema  
B. A low signal serpiginous line at the articular surface  
C. Large joint effusion

Reference:  

2. A 55 yo woman presents with a sudden onset of hip pain. An MRI, shown below, is diagnostic for what disorder?

![MRI Image]

A. AVN  
B. Fracture  
C. Idiopathic transient osteoporosis of the hip

Reference:  
3. A 40 yo woman marathon runner reports a recent onset of hip pain. An MRI, shown below, is diagnostic for what entity?

A. ITOH  
B. Stress fracture  
C. Stress reaction

Reference:  
4. A 25 yo woman with a painful, clicking hip has the following MRI. What is the diagnosis?

A. Torn or detached acetabular labrum
B. ITOH
C. Stress fracture

Reference:

5. How is femoroacetabular impingement (FAI) is best diagnosed?

A. Plain films with various measurements
B. MRI with various measurements
C. Clinical exam by an orthopedic surgeon

Reference:
SAM Questions for SHOULDER MRI (15 questions for 3 hours)

Target Audience: This self-assessment module is intended for radiologists in either a general academic group or in private practice.

Learning Objectives:
At the completion of this exercise, the participant will be able to:

1. Recognize MR imaging findings of the rotator cuff
2. Recognize the MR imaging appearance of some normal anatomic variants in the shoulder
3. Recognize MR imaging findings of the glenoid labrum

Self-Assessment Questions
1. Most rotator cuff pathology is now considered due to which of the following?
   A. Impingement
   B. Intrinsic degeneration
   C. Congenital abnormalities

Reference:
Papadonikolakis, et al. Published evidence relevant to the diagnosis of impingement syndrome of the shoulder. JBJS 2011; 93: 1827-32


2. What is the most common type of rotator cuff tear?
   A. Bursal-sided partial tear
   B. Full thickness tear at the critical zone
   C. Rim rent

Reference:

3. How are most full thickness rotator cuff tears reported to surgeons?
   A. By gap measurement using the coronal images
   B. By gap measurement using the coronal and sagittal images
   C. As small, medium or large tears

Reference:

4. What is the most common abnormality of the rotator interval seen on MRI?
   A. Torn coracohumeral ligament
   B. Torn superior glenohumeral ligament
   C. Obliteration of fat due to scarring from adhesive capsulitis

References:
5. A Buford complex and a sublabral foramen, two normal variants of the labrum, occur in which quadrant of the labrum?
   A. Anterosuperior
   B. Posterior
   C. Anteroinferior

References:

6. A 50 yo man dislocated his shoulder and his subsequent MRI, shown below, reveals what abnormality?

A. A Hill Sachs deformity
B. A HAGHL lesion
C. A Bankhart lesion

Reference:
7. A 50 yo man presents with clinical findings suggesting a rotator cuff tear and has an MRI which shows a fluid collection in the spinoglenoid notch (shown below). Which muscle(s) might show edema and/or atrophy?

A. Supraspinatus
B. Infraspinatus
C. Deltoid
D. Teres minor

Reference:
8. A 50 yo man presents with a sudden onset of severe shoulder pain two months ago and now has weakness. He has an MRI shown below. What is the most likely diagnosis?

A. Rotator cuff muscle strain
B. Parsonage Turner syndrome
C. C-spine disc herniation

Reference:
9. A 50 yo man presents with clinical findings suggesting a rotator cuff tear and has an MRI which shows fatty atrophy involving the teres minor muscle. A sagittal T1 image is shown below. His rotator cuff appeared normal. What is the most likely diagnosis?

A. Parsonage Turner syndrome  
B. Adhesive capsulitis  
C. Quadrilateral space syndrome

References:

10. This baseball pitcher has shoulder pain and decreased throwing velocity. What abnormality is shown on this MRI?

A. Rotator cuff tear
B. Partial cuff tear
C. SLAP tear

References:

11. A 50 yo man presented with clinical findings suggesting a rotator cuff tear. An MRI showed a normal cuff, however, the sagittal T2 image (below) shows a fluid collection anterior to the subscapularis. Where is this fluid located?

A. Subacromial – subdeltoid bursa  
B. Joint space  
C. Subcoracoid bursa

Reference:  
Schraner AB, et al. MR imaging of the subcoracoid bursa. AJR. 1999;172:1567-71
12. A 35 yo man has a painful shoulder with limitation of activities. What abnormality is shown on his MR (shown below)?

A. Critical zone cuff tear
B. Partial cuff tear, bursal sided
C. Partial cuff tear, articular side (rim rent)

References:

13. A 40 yo woman has shoulder pain and limitation of motion. Her sagittal T1 and T2 images from her MRI are shown below. What is her diagnosis?

A. Torn rotator cuff  
B. Adhesive capsulitis  
C. Parsonage Turner syndrome

Reference:
14. A 25 yo man who suffered a shoulder dislocation has an MRI, shown below. What is his diagnosis?

Reference:
15. A 50 yo man has had chronic shoulder pain and recently had shoulder trauma. An MRI, shown below, reveals what abnormality?

A. A large rotator cuff tear with moderate tendon retraction
B. A partial rotator cuff tear
C. A rim rent

Reference:

2015 SAM QUESTIONS: MRI OF THE WRIST (5 questions = 1 hour)

1. Abnormal marrow signal in the proximal ulnar aspect of the lunate suggests:
   A. Kienbock’s disease
   B. hamatolunate impaction
   C ulnolunate impaction
   D. stylocarpal impaction


2. Peripheral tears of the triangular fibrocartilage:
   A. are most often secondary to chronic degeneration
   B. are less accurately diagnosed with MRI than are central tears
   C. have worse healing potential than central tears
   D. are less commonly symptomatic than central tears

3. A complete tear of the scapholunate ligament may lead to a:
   A. VISI deformity
   B. SLAC wrist
   C. carpal tunnel syndrome
   D. flexor carpi radialis tenosynovitis

Reference:

4. The intersection syndrome:
   A. involves the tendons of the third and fourth extensor compartments
   B. is centered 3-4 cm proximal to the radiocarpal joint
   C. is best demonstrated on T1W images
   D. does not result in abnormal findings distal to the radiocarpal joint

Reference:

5. Ganglia of the wrist:
   A. are uncommon
   B. are rarely septated
   C. require contrast administration for diagnosis
   D. are most common along the dorsal SLL and volar radiocarpal ligaments

Reference:

2015 SAMS QUESTIONS: MRI OF THE ANKLE AND FOOT (15 questions for 3 hours credit)

1. Hagland’s Syndrome typically includes:
   A. tendinosis and partial tearing of the Achilles tendon 5-6 cm proximal to its calcaneal insertion.
   B. marrow edema within the posterior talus.
   C. retrocalcaneal bursitis.
   D. thickening and partial tearing of the proximal plantar aponeurosis.


2. With regard to the peroneal tendons:
   A. a peroneus tertius is the most common accessory muscle of the ankle.
   B. tendon subluxation indicates injury/stripping of the flexor retinaculum.
   C. the tendons pass through the tarsal tunnel as they course into the foot.
   D. tears of the peroneus brevis are more common than those of the peroneus longus.


3. Regarding the use of MR imaging for diagnosing osteomyelitis in the foot:
   A. neuropathic arthropathy can be easily differentiated from infection based on a lack of contrast enhancement within the affected bones.
B. confluent decreased signal intensity within the marrow on T1W images is highly specific for osteomyelitis
C. increased signal intensity within the bone marrow on fat-saturated T2W or STIR images is highly specific for osteomyelitis.
D. gadolinium enhancement within the bone marrow is highly specific for osteomyelitis.

Reference:
Johnson PW, Collins MS, Wenger DE. Diagnostic utility of T1-weighted MRI characteristics in evaluation of osteomyelitis of the foot. AJR. 2008;192:96-100

4. Injury of the Lisfranc ligament:
   A. is most commonly due to a direct blow to the midfoot.
   B. is often associated with midfoot fractures
   C. is best demonstrated on sagittal MR images
   D. is best diagnosed on an oblique radiograph of the midfoot.


5. A Morton neuroma:
   A. is a benign neoplasm of a plantar digital nerve.
   B. may be found in asymptomatic patients.
   C. is most conspicuous on T2W short axis images.
   D. does not typically enhance due to its fibrous nature.

Reference

6. Turf toe:
   A. is best demonstrated on sagittal and short axis MR images.
   B. may be suspected on radiographs if there is distal migration of the hallux sesamoids.
   C. always involves disruption of the plantar plate complex of the great toe.
   D. typically involves tearing of the flexor hallucis longus tendon.

Reference

7. The calcaneofibular ligament
   A. courses in an anterior oblique direction from the distal tip of the fibula to the calcaneus
   B. lies immediately superficial to the peroneal tendons
   C. is most easily seen on sagittal images
   D. typically tears after the anterior talofibular ligament


8. The Hawkins sign:
   A. indicates avascular necrosis of the talus
   B. is seen in the head of the talus
C. is usually observed about six weeks after injury
D. is synonymous with an osteochondral lesion


9. Regarding tarsal coalition:
   A. It may or may not involve a true bony coalition
   B. A calcaneocuboid coalition is most common
   C. A talocalcaneal coalition is best seen on axial images
   D. Cross-sectional imaging is needed for accurate diagnosis


10. Syndesmotic injury
    A. involves the talofibular ligaments
    B. may result in a proximal fibular fracture
    C. results from severe plantar flexion of the foot
    D. typically results in an avulsion fracture of the lateral malleolus


11. Plantar fasciitis
    A. most commonly affects its lateral band
    B. results in severe attenuation of the fascia
    C. is best demonstrated on axial images
    D. may be associated with marrow edema in the calcaneus


12. Posterior tibial tendon pathology
    A. may result in sinus tarsi syndrome
    B. leads to a pes cavus deformity
    C. is most common in active, younger patients
    D. most commonly occurs near its musculotendinous junction

Reference: Chhabra A, Soldatos T, Chalian M, et. al. 3-Tesla magnetic resonance imaging evaluation of posterior tibial tendon dysfunction with relevance to clinical staging. J Foot Ankle Surg 2011;320-328

13. Sinus tarsi syndrome
    A. produces chronic medial hindfoot pain
    B. is a degenerative process
    C. is suggested by low signal tissue in the sinus tarsi on T1W images
    D. is an imaging diagnosis


14. Regarding ankle tendon anatomy
    A. the peroneus brevis tendon lies lateral or posterior to the longus
B. the posterior tibial and flexor hallucis tendons cross at the Knot of Henry
C. the anterior tibial tendon is the most lateral extensor tendon at the ankle
D. the tibial nerve lies between the flexor digitorum and flexor hallucis longus tendons


15. Tarsal tunnel syndrome
   A. results in paresthesias along the dorsum of the foot
   B. is often secondary to peroneal tenosynovitis
   C. involves the tibial nerve or its branches
   D. always results from a space occupying mass in the tunnel


SAM Questions for MRI of Tumors (5 questions for 1 credit hour)
Target Audience: This self-assessment module is intended for radiologists in either a general academic group or in private practice.
Learning Objectives:
At the completion of this exercise, the participant will be able to:

1. appreciate the difficulty in differentiating benign from malignant chondroid tumors.
2. understand the use and pitfalls of gadolinium in tumors.
3. know which tumors resemble fluid collections.

Self-Assessment Questions
1. Which of the following is true of chondroid tumors?
   A. A biopsy should be performed to tell benign from malignant
   B. Plain films can reliably differentiate benign from malignant
   C. Biopsy should be avoided, if possible, because pathologists have a difficult time differentiating benign from malignant

Reference:

2. The following plain film of a femur in a 55 yo man taken following trauma shows a chondroid lesion. Which of the following statements should be included in the interpretive report?
A. Cannot exclude a chondrosarcoma
B. Differential diagnosis includes enchondroma and chondrosarcoma
C. This is a benign appearing chondroid lesion with no aggressive features seen.

Reference:

3. Which of the following statements concerning gadolinium use for tumors is correct?
   A. Gadolinium should be given for MRI of all tumors
   B. Gadolinium should be used to tell a solid tumor from a fluid collection
   C. Fat suppressed T1 images should be used following gadolinium administration

References:

4. Which tumors most often resemble fluid collections?
   A. Lipomas
   B. Malignant fibrous histiocytomas and desmoids
   C. Synovial sarcomas and neural tumors

Reference:
May DA. MR imaging of musculoskeletal tumors and tumor mimickers with intravenous gadolinium - experience with 242 patients. Skeletal Radiology. 1997;26:2-15

5. What is the most reliable imaging indicator for differentiating a simple lipoma from a well-differentiated liposarcoma (atypical lipoma)?
A. An atypical lipoma will enhance with gadolinium
B. Rapid growth indicates an atypical lipoma
C. Thick fibrous strands indicate an atypical lipoma

Reference:
Gaskin CM. Lipomas, lipoma variants, and well-differentiated liposarcomas (atypical lipomas): results of MRI evaluations of 126 consecutive fatty masses. AJR 2004 Mar;182:733-9

**SAM Questions for MRI of the Lumbar Spine (10 questions for 2 hours credit)**
Target Audience: This self-assessment module is intended for radiologists in either a general academic group or in private practice.
Learning Objectives:
At the completion of this exercise, the participant will be able to:

1. apply the proper imaging protocol for the lumbar spine
2. use the proper terminology for disc disease and stenosis
3. diagnose abnormalities in the lumbar spine that can mimic disc disease

**Self-Assessment Questions**

1. A proper MRI spine protocol includes which of the following?
   A. Angled axial cuts through each disc space
   B. Coronal T1 and T2 images
   C. Contiguous stacked axial images

   Reference:

2. Which of the following terms for a focal disc bulge is recommended?
   A. Protrusion
   B. Extrusion
   C. Extruded
   D. Herniation

   Reference:

3. Concerning a lateral disc, which of the following is incorrect?
   A. It will impress and distort the thecal sac
   B. It can clinically mimic a disc protrusion one level cephalad
   C. It can result in surgery at the wrong level
   D. It can occlude the neuroforamen

   Reference:

4. Asymptomatic focal disc bulges are found in what percentage of the population over the age of 40?
A. 5%
B. 10%
C. 20%
D. 40%

References:

Jarvik JJ. The Longitudinal Assessment of Imaging and Disability of the Back (LAIDBack) Study: baseline data. Spine 2001; 26: 1158-66

5. Which of the following is one of the most common causes of failed disc surgery?
   A. Infection
   B. Wrong level surgery
   C. Failure to remove a free fragment or sequestration

Reference:


6. A sagittal T2 weighted image, shown below, reveals bands of high signal at the vertebral body endplates around the L3-4 disc. What do these represent?

A. Type 1 Modic changes
B. Type 2 Modic changes
C. Infection

Reference:

7. A T2 weighted axial image through the L5 level is shown below. What is the diagnosis?

A. Epidural hematoma
B. Epidural lipomatosis
C. Arachnoiditis

Reference:
Delamarter R. Diagnosis of lumbar arachnoiditis by magnetic resonance imaging. Spine 1990;15:304-10

8. An axial T1 weighted image through the L5-S1 disc space, shown below, shows a disc bulge. What terminology best describes this?

A. A disc protrusion causing spinal stenosis
B. A herniation
C. A focal disc protrusion

Reference:
9. A sagittal T1 weighted image of the lumbar spine, shown below, shows abnormalities at the spinous processes. What is this called?
   A. Degenerative disease
   B. Infection
   C. Baastrup’s

Reference:


10. An axial T1 weighted image, shown below, shows a mass adjacent to the left facet joints that is impressing the thecal sac. What is this mass?

A. A neurogenic tumor
   B. An intraspinal synovial cyst
C. A large sequestration

References:


SAM QUESTIONS: MRI OF THE ELBOW (5 questions = 1 hour credit)

1. The most important stabilizer of the elbow during the throwing motion is the:
   A. radial collateral ligament
   B. lateral ulnar collateral ligament
   C. anterior band, ulnar collateral ligament
   D. annular ligament


2. The most commonly affected structure in the pediatric thrower's elbow is:
   A. the lateral epicondylar apophysis
   B. the medial epicondylar apophysis
   C. the common extensor tendon
   D. the ulnar collateral ligament


3. The “T” sign on a MR arthrogram of the elbow refers to:
   A. an osteochondral lesion of the trochlea.
   B. a partial tear of the lateral ulnar collateral ligament.
   C. a partial tear of the triceps tendon.
   D. a partial tear along the undersurface of the ulnar collateral ligament.


4. The posterior interosseous nerve:
   A. Is a terminal branch of the median nerve
   B. pierces the supinator muscle at the arcade of Frohse
   C. innervates the flexor musculature of the forearm
   D. may become entrapped at the ligament of Struthers


5. The three common sites of pathology in the elbow associated with the valgus overload syndrome include:
   A. the ulnar collateral ligament (UCL); trochlea; coronoid process
   B. the radial collateral ligament (RCL); capitellum; biceps tendon
   C. the UCL; capitellum; posteromedial joint
   D. the UCL; RCL; posteromedial joint

**SAM QUESTIONS: MRI OF OSSEOUS TRAUMA (5 questions = 1 hour)**

1. **The earliest radiographic sign of a developing stress fracture in cortical bone is:**
   A. focal periosteal reaction
   B. a faint sclerotic band
   C. corticoperiosteal thickening
   D. subtle intracortical lucency
   **Reference:**
   Mulligan ME. The "gray cortex": an early sign of stress fracture. Skeletal Radiol. 1995;24:201-203

2. **Epiphysiolysis:**
   A. is another name for an acute Salter-Harris type 1 fracture
   B. affects the lateral humeral epicondyle in young throwers ("little leaguer's elbow")
   C. is a repetitive stress injury of bone
   D. requires cross-sectional imaging for diagnosis
   **Reference:**

3. **Spontaneous osteonecrosis of the knee:**
   A. most commonly affects young adults.
   B. typically involves the medial femoral condyle
   C. usually results from long term steroid use.
   D. is often associated with tears of the posterior root of the lateral meniscus
   **Reference:**

4. **Which is considered a “high risk” stress fracture?**
   A. lateral femoral neck
   B. posterior tibial cortex
   C. medial femoral neck
   D. calcaneus
   **Reference:**

5. **The best MR imaging sign of an unstable osteochondral fragment is:**
   A. edema within the subchondral fragment
   B. enhancement within the subchondral fragment
   C. high T2 (fluid) signal intensity surrounding the fragment
   D. marrow edema beneath the subchondral fragment
   **Reference:**