

MULTIPLE CHOICE

MSK PRINCIPLES - PRACTICE SET

PROPOSED FOR REVIEW - questions are the author's verbatim Q&A; distractors are auto-selected from other answers in the same bank and must be checked by a subject-matter reviewer (a distractor could coincidentally be correct). Not authoritative assessment content.

1. Which transducer is generally MOST appropriate for evaluating superficial structures such as the finger flexor tendons or carpal tunnel?

- A. Low-frequency curvilinear transducer
- B. Phased-array (sector) transducer
- C. Intracavitary endocavity transducer
- D. High-frequency linear-array transducer

2. True or false: A normal hyaline articular cartilage layer should appear hyperechoic relative to adjacent muscle.

- A. False
- B. True

3. Anisotropy in musculoskeletal ultrasound is best defined as:

- A. Reverberation arising between two highly reflective interfaces
- B. An angle-dependent change in echogenicity of highly ordered structures when the beam is not perpendicular
- C. Increased through-transmission deep to a fluid-filled structure
- D. Loss of signal posterior to a calcified structure

4. A sonographer is unable to fully visualize the supraspinatus footprint because the patient cannot extend or internally rotate the shoulder. Which technique should be employed first?

- A. Use the modified Crass or Crass position to bring the tendon out from under the acromion
- B. Switch to a curvilinear transducer
- C. Apply harmonic imaging to reduce artifact
- D. Increase the depth setting to gain anatomic coverage

5. A focal hypoechoic region within a tendon disappears when the operator angles the transducer so the beam is perpendicular to the fibers. The MOST likely explanation is:

- A. Focal tendinosis
- B. Anisotropy artifact
- C. Calcific tendinopathy
- D. Partial-thickness tendon tear

6. A patient with a suspected Baker cyst is scanned. To distinguish a simple Baker cyst from a complex collection, which sonographic feature is MOST helpful?

- A. Anechoic contents with posterior acoustic enhancement and a neck between the medial gastrocnemius and semimembranosus
- B. A honeycomb internal pattern
- C. A cortical hyperechoic line with shadowing
- D. A hyperechoic fibrillar internal architecture

7. Which of the following BEST describes the relationship between transducer frequency and resolution/penetration in MSK ultrasound?

- A. Higher frequency decreases resolution and increases penetration
- B. Frequency has no effect on resolution or penetration
- C. Higher frequency improves both resolution and penetration
- D. Higher frequency improves resolution but decreases penetration

8. Compared with MRI, a particular strength of musculoskeletal ultrasound is:

- A. Real-time dynamic evaluation during active and passive motion

- B. Higher contrast for deep posterior shoulder structures
- C. Independence from operator skill
- D. Superior visualization of intraosseous marrow

9. To take advantage of the natural focal zone of a high-frequency linear array when scanning a superficial tendon, the sonographer should:

- A. Use multiple focal zones at the skin surface
- B. Set the focal zone at the deepest point of the field of view
- C. Disable focusing to maximize uniform brightness
- D. Place the electronic focal zone at or just deep to the tendon of interest

10. Which sonographic feature characterizes a normal cortical bone surface?

- A. A hyperechoic fibrillar band without shadowing
- B. A bright continuous hyperechoic line with posterior acoustic shadowing
- C. An anechoic compressible band
- D. A honeycomb pattern of low-level echoes

11. During a rotator cuff examination, the supraspinatus tendon appears artifactually hypoechoic. Which adjustment is the MOST appropriate first step?

- A. Heel-toe the transducer to keep the beam perpendicular to the tendon fibers
- B. Apply firm graded compression over the tendon
- C. Increase the overall gain
- D. Switch to a lower-frequency transducer

12. Which sonographic feature most reliably distinguishes a ligament from an adjacent tendon?

- A. A ligament is anechoic while tendon is hyperechoic
- B. A ligament connects bone to bone and shows a more compact, slightly less ordered fibrillar pattern
- C. A ligament shows a honeycomb pattern while tendon does not
- D. A ligament demonstrates posterior shadowing while tendon does not

13. While scanning the bicipital groove, dynamic external rotation of the shoulder is performed and the long head of the biceps tendon is observed to displace medially over the lesser tuberosity. This MOST likely represents:

- A. Calcific tendinopathy
- B. Anisotropy artifact
- C. Subluxation or dislocation of the long head of the biceps tendon
- D. Normal physiologic motion of the tendon

14. On a long-axis sonographic image, a normal tendon characteristically demonstrates which echotexture?

- A. Hypoechoic honeycomb pattern with rounded fascicles
- B. Hyperechoic fibrillar pattern of parallel linear echoes
- C. Anechoic compressible tubular structure
- D. Heterogeneous pennate pattern with central echogenic line

15. In contrast to hyaline cartilage, fibrocartilage such as the knee meniscus or acromioclavicular disc typically appears as:

- A. A hyperechoic, triangular or wedge-shaped structure
- B. A uniformly anechoic band over the bone surface
- C. A compressible anechoic structure with through-transmission
- D. A honeycomb pattern of fascicles

16. A normal, non-distended bursa typically appears on ultrasound as:

- A. A thick hyperechoic fibrillar band
- B. A heterogeneous, vascular soft tissue collection
- C. A rounded anechoic mass with posterior enhancement
- D. A thin hypoechoic or anechoic line between two hyperechoic fat layers

17. On a high-resolution image, a peripheral nerve can be reliably differentiated from an adjacent tendon by:

- A. Tracing the structure proximally and distally and noting that nerves do not move significantly with joint motion while tendons do
- B. Showing that nerves are compressible while tendons are not
- C. Observing that nerves shadow while tendons do not
- D. Demonstrating that nerves are anechoic while tendons are hyperechoic

18. Color or power Doppler in musculoskeletal ultrasound is MOST useful for which of the following?

- A. Quantifying cartilage volume
- B. Distinguishing a hypoechoic vessel from a hypoechoic tendon tear
- C. Differentiating anisotropy from calcific tendinopathy
- D. Measuring tendon thickness

19. Dynamic ultrasound evaluation is MOST useful for which of the following findings?

- A. Detecting an avascular intratendinous calcification
- B. Measuring cortical bone thickness
- C. Demonstrating snapping of the iliotibial band over the greater trochanter
- D. Quantifying hyaline cartilage volume

20. A hypoechoic region within a tendon that does NOT change with rocking the transducer, persists across multiple imaging planes, and shows internal hyperemia on power Doppler is MOST consistent with:

- A. Anisotropy artifact
- B. Tendinosis with neovascularity
- C. Normal tendon
- D. Acoustic shadowing from underlying bone

21. True or false: Anisotropy is unique to musculoskeletal ultrasound and does not occur in other body systems.

- A. True
- B. False

22. Spatial compounding may help reduce anisotropy artifact because it:

- A. Eliminates side-lobe artifact by changing apodization
- B. Increases the operating frequency of the transducer
- C. Acquires and averages frames from multiple beam-steering angles
- D. Suppresses harmonic frequencies generated in tissue

23. Which artifact is MOST suggestive of calcium hydroxyapatite within a tendon?

- A. Echogenic foci within the tendon with posterior acoustic shadowing
- B. Posterior acoustic enhancement deep to the tendon
- C. A comet-tail artifact arising from subcutaneous gas
- D. Angle-dependent hypoechogenicity that resolves with toggling

24. A hockey-stick (small-footprint, high-frequency) transducer is MOST useful for which MSK application?

- A. Imaging small superficial structures such as finger pulleys and digital nerves
- B. Assessing the deep portion of the gluteal muscles
- C. Imaging the deep posterior hip
- D. Evaluating the iliopsoas muscle in an obese patient

25. Which sonographic finding most strongly suggests a full-thickness rotator cuff tear rather than tendinosis?

- A. Hypoechoic region that disappears on beam angulation
- B. Hyperechoic foci with clean posterior shadowing
- C. Fusiform thickening with maintained continuity
- D. A visible defect across the entire tendon thickness with retraction or fluid filling the gap