

### Sample Questions: Knee

1. b. The patient may have a meniscus tear

#### ADDITIONAL EXPLANATION

a. Incorrect. Sometimes osteoarthritis may limit range of motion, but this patient had a mechanism

of injury.

b. Correct. This patient had a common mechanism for someone his age for a posterior horn meniscus tear. Usually stiffness will limit the posterior translation of the meniscus on the tibia, which sets the posterior horn up for getting pinched in the joint.

c. Incorrect. Not a mechanism for a hamstring strain.

d. Incorrect. This patient's pain is all posterior and not in the area of the patella retinaculum.

2. b. Cruciates are extrasynovial and intracapsular, menisci are intrasynovial

#### ADDITIONAL EXPLANATION

b. Correct. The fact that the cruciates are within the capsule and have a good blood supply would set them up for a quick bleed when injured, and thus immediate swelling.

Menisci are bated in synovium, and synovitis-type swelling would occur over a longer period of time. (approximately 24 hours)

3. d. Posterior Cruciate Ligament Injury

#### ADDITIONAL EXPLANATION

a. Incorrect. This resulted from a hyperflexion mechanism. She also has a posterior sag on exam.

b. Incorrect. No valgus stress

c. Incorrect. No rotary mechanism. Not enough information to completely rule this out, but the mechanism indicated points to something else more obvious.

d. Correct. This can be a typical mechanism for a PCL injury. A posterior sag presentation should immediately raise your suspicion this structure might be involved.

4. c. Posterior Drawer Test

#### ADDITIONAL EXPLANATION

a. Incorrect. This checks the integrity of the anterior cruciate ligament. You may get a positive finding with this if the posterior elements are disrupted if you begin the test in a degree of post-tibial translation

b. Incorrect. ACL test

c. Correct.

d. Incorrect. This checks the integrity of the medial collateral ligament

5. b. False

ADDITIONAL EXPLANATION

b. Correct. A torn posterior cruciate ligament may cause a degree of posterior translation at the tibofibular joint. So when you begin this test, the tibia may already be posterior translated so that you feel increased laxity with your line of pull. Thus, giving the impression of a positive test (false positive). It is important to note the quality of the "end feel when performing a Lachman's.

6. b. Osgood Schlater's Disease

ADDITIONAL EXPLANATION

- a. Incorrect. This would likely be seen in an older individual unless there was a precipitating trauma.
- b. Correct. The palpable tender bump gives this away. This is normally seen in young adolescents who are rapidly growing. The musculature is not keeping up with the long bone growth, thus creating a pull, or apophysitis traction type of inflammation at the quad insertion.
- c. Incorrect, This might coexist, but is not the best answer here
- d. Incorrect. Similar apophysits condition at the Achilles attachment on the calcaneous.

7. d. Quadricep stretching and counterforce brace

ADDITIONAL EXPLANATION

- a. Incorrect. This would likely increase the symptoms by increasing tension on the quadriceps attachment.
- b. Incorrect. May help to some degree with compression, but does not address the underlying mechanics
- c. Incorrect. May help decrease inflammation, but again does not address underlying mechanics
- d. Correct. Increasing flexibility of the quadriceps would decrease the tension at its insertion, thus decreasing the source of the symptoms. Also a counterforce brace is sometimes helpful in decreasing the tension at the quadriceps insertion when it's active.

8. c. Osteomyelitis

ADDITIONAL EXPLANATION

- a. Incorrect. No evidence of a tick bite.
- b. Incorrect. This is a metabolic bone disorder, characterized by weakening of the bones and multiple unexplained fractures.
- c. Correct. Any sort of deep bony infection predisposes one to this type of condition which can result in bone and joint destruction at a later time.
- d. Incorrect. This can be possible, but the fact that the patient had a previous deep bony infection earlier make osteomyelitis the best answer.

9. b. Medial patellar retinaculum

ADDITIONAL EXPLANATION

- a. Incorrect.
- b. Correct. As the patella is displaced laterally, this stresses the supporting retinacular structure on the medial side.
- c. Incorrect. Not likely
- d. Incorrect. Not completely correct because it's connective tissue expansion (medial retinaculum) is what is torn.

10. a. Anterior cruciate ligament injury

ADDITIONAL EXPLANATION

- a. Correct. You have a rotational mechanism, immediate swelling, and special tests that are positive for ACL findings.
- b. Incorrect. No valgus stress noted
- c. Incorrect. May be present, but not given enough information above
- d. Incorrect.

11. c. Magnetic Resonance Imaging (MRI)

ADDITIONAL EXPLANATION

- c. Correct. An MRI is the most sensitive to determine an anterior cruciate ligament. X-rays would not demonstrate a soft tissue injury.

12. b. Anterior cruciate, medial meniscus, medial collateral ligament

13. d. 10 weeks post-op

ADDITIONAL EXPLANATION

- d. Correct. 8-10 weeks of ROM < 90 is recommended to avoid disrupting meniscal repair.

14. c. OA at the knee

ADDITIONAL EXPLANATION

- c. Correct. The patient fits into Category 2 for knee OA (knee pain and crepitus w/ AROM, morning stiffness > 30 minutes, age ≥38) with a Sp of 88%. (Altman 1991, Altman 1991)

15. c. Manual therapy directed at the hip and knee

ADDITIONAL EXPLANATION

- c. Correct. According to Currier 2007, there is a 97% chance of pain being reduced by 30% within 48 hours when knee OA is treated with manual therapy & exercise

16. C. Age >55 years

17. B. Leg dominance

ADDITIONAL EXPLANATION

B. Correct: the 4 factors are ligament, quadriceps, leg and trunk/core dominance

18. B. Hamstrings are an ACL synergist

ADDITIONAL EXPLANATION

A. Incorrect: the attachments of the hamstrings offer better frontal plane control of the joint

B. Correct: hamstring activation places a posterior translation moment of the tibia on the femur

C. Incorrect: an anterior center of mass would increase knee extension

D. Incorrect: the advantage is the hamstrings place the knees in more flexion which offers better mechanical advantage

19. D. Open Kinetic Chain at 0-40 degrees. The quadriceps should be electrically silent during swing phase with the hamstrings eccentrically contracting to decelerate the tibia. Tight hamstrings cause the quadriceps to initiate action early, extending the knee during end-range thus promoting breakdown of the joint surfaces.

ADDITIONAL EXPLANATION

D. Correct: Open kinetic chain extension from 0-40 degrees places the most shear forces and pounds per square inch at the patellofemoral joint, thus increasing wear and tear of the joint.

20. A. 3%

ADDITIONAL EXPLANATION

A. Correct. The patient has a score (according to Riddle 2004, Wells 1995, 1997, 1998) of "0" which equates to a 3% chance of P-DVT. If the patient was bedridden for >3 days, pitting edema worse on right than left, calf swelling >3cm, and the presence of collateral nonvaricose veins, then the patient would have been in the high category and have a 75% chance of P-DVT.