
THE JOURNAL OF BONE & JOINT SURGERY

CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

JULY, AUGUST, SEPTEMBER
2008

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THE DEADLINE TO SUBMIT YOUR ANSWERS FOR GRADING THIS SET OF QUESTIONS IS JANUARY 15, 2009.

PURPOSE

The purposes of this CME program are:

- To provide the general orthopaedic surgeon with an ability to assess his or her continuing competence in orthopaedics through the acquisition of contemporary scientific information.
- To provide a broad-based review and update of the major subspecialty areas in orthopaedics.
- To make *The Journal* reader aware of new advances in orthopaedic surgical techniques and technology.

INSTRUCTIONS

In order to benefit most from this educational experience and qualify for Continuing Medical Education credit, please observe the following instructions:

1. Read the learning objectives listed on the Response Form and be certain that they meet your individual learning needs.
2. These CME questions have been derived from the information presented in the July, August, and September issues of the 2008 American volume of *The Journal of Bone and Joint Surgery* (Vol. 90-A). A careful study of each article should yield the best response to each question.
3. Record your answers and complete all portions of the attached Response Form in the back of this document. Upon successful completion of the examination, you may claim up to ten category-1 CME credits. However, to claim up to ten credits to satisfy self-assessment examination requirements mandated by the Maintenance of Certification process, you must take the *online* JBJS quarterly examination.
4. In order for the American Academy of Orthopaedic Surgeons to document your participation in the CME activity, Academy Fellows must provide their AAOS membership number in the designated area on the Response Form.
5. In addition to providing the answers to the CME questions, you must complete the examination evaluation questions. These questions are found on the Response Form. The way you answer these evaluation questions will not in any way affect the score that you achieve.
6. All completed answer sheets will be graded, and you will be advised of the results of this examination within four weeks after it is received. In order to qualify for CME credit, a score of more than 50% correct must be achieved on the examination. The charge must be paid at the time that the answer sheet is submitted. **The deadline to submit your answers for grading this set of questions is January 15, 2009.**

1. **A twenty-nine-year-old male ski instructor is seen two years after a partial medial meniscectomy. The meniscal injury was a very large bucket-handle tear that resulted in removal of about 70% of the posterior half of the medial meniscus, but the meniscal rim remained intact. The patient now presents with an acute injury to the same knee with clinical findings of instability, effusion, and medial joint-line pain. Magnetic resonance imaging confirms a complete tear of the anterior cruciate ligament and further tearing of the medial meniscus, but the lateral meniscus and chondral surfaces are intact. The knee is in neutral alignment. The patient undergoes anterior cruciate ligament reconstruction and arthroscopic placement of a collagen meniscus implant to replace the lost meniscal tissue and to fill the meniscal defect. What is the most likely outcome for this patient?**
 - A. he can expect to resume skiing without restriction in three to four months
 - B. he should plan to change his profession and lifestyle permanently because there is no possibility of adequate recovery
 - C. his outcome will be compromised because he underwent concurrent anterior cruciate ligament reconstruction and placement of a collagen meniscus implant
 - D. his outcome should not be influenced by having had both procedures concurrently because anterior cruciate ligament reconstruction does not appear to impact the results of placement of a collagen meniscus implant
 - E. he will require conversion to a total knee arthroplasty within five years
2. **A sixty-year-old woman has some questions regarding her planned surgical fusion of the first metatarsophalangeal joint. During the discussion, she states that she dislikes taking oral analgesics and wonders whether there are any other methods for pain relief that the surgeon or anesthesiologist could perform to help with postoperative pain. You state that regional nerve blockade can be performed for forefoot surgery and describe which of the techniques might be safe and effective. Which of the following statements is correct?**
 - A. ankle block alone does not alter perception of pain
 - B. popliteal block alone does not alter perception of pain
 - C. a combination of ankle and popliteal blocks is not safe
 - D. a combination of ankle and popliteal blocks is safe but no more effective than ankle block alone
 - E. a combination of ankle and popliteal blocks is safe and more effective than ankle block alone
3. **In a cadaver study, torsional loads were applied to the intact hip joint and substantial mechanical strains were elicited in the anterior part of the acetabular labrum. Which of the following statements is true?**
 - A. strains were highest in hips with femoroacetabular impingement
 - B. strains were elicited only if the hips were aligned within 50° of neutral in any direction
 - C. maximum strains were elicited at maximum ranges of motion
 - D. substantial strains were elicited with the hip loaded in external rotation or abduction
 - E. maximum strains were elicited only in hip flexion and internal rotation
4. **In a retrospective analysis of mortality following vertebral compression fractures in a Medicare population, the authors found which of the following groups to be most at risk of dying following this injury?**
 - A. older men
 - B. older women
 - C. younger men
 - D. younger women
5. **A hospital is trying to determine whether to invest in a new expensive technology designed to improve the outcomes of knee replacement. The technology has demonstrated some ability to improve short-term im-**

- plant alignment, but no study has shown improved long-term survival of knee replacements done with use of the technology. Which of the following is true?**
- the hospital should buy the technology to remain competitive
 - the hospital should not buy the technology because of the high cost
 - the number of knee replacements performed at the hospital should not be a factor in the decision
 - other programs needing funding at the hospital should not be a factor in the decision
 - the hospital needs to weigh the likelihood of improved outcomes based on available data against the cost of the technology and against other potential uses of the funds needed for the investment in order to make a decision
- 6. In a group of two-year-old children who had been treated as infants for clubfoot deformity with Achilles tendon lengthening and the Ponseti method, a prevalent finding was:**
- increased dorsiflexion of the ankle in the stance phase of gait
 - ankle stiffness
 - footdrop in the swing phase of gait
 - intoeing
 - strong plantar flexors
- 7. A seventy-four-year-old woman is seen nineteen years following a right total hip arthroplasty with vague right hip pain that started approximately three weeks previously, shortly after she had begun a water exercise program. There is tenderness over the area of the greater trochanter. A radiograph reveals eccentric articulation of the femoral head in the socket and an area of osteolysis in the greater trochanter that appears larger than it did on radiographs made at her last follow-up visit, seven years previously. What is the most likely cause of the hip pain?**
- trochanteric bursitis
 - stem loosening
 - wear debris synovitis
 - cup loosening
 - fracture of the greater trochanter
- 8. When performing surgery that involves articular cartilage, maintaining an optimal physiologic environment may improve cartilage viability. Bovine osteochondral explants were exposed to irrigation solutions of varying osmolarity (0 to 480 mOsm) for ninety seconds, then wounded with a full-thickness scalpel through the articular cartilage, and then exposed to the same fluid medium for another 2.5 hours. Subsequent analysis showed that chondrocyte viability was best maintained at an osmolarity of:**
- 0 mOsm
 - 10 mOsm
 - 170 mOsm
 - 340 mOsm
 - 480 mOsm
- 9. Numerous factors related to polyethylene implant processing have been hypothesized to increase the articular surface wear of polyethylene tibial bearings that were sterilized with gamma radiation in air. Of the following variables, which is the only one that has been found to be significantly associated with in vivo loss of the thickness of gamma-irradiated-in-air polyethylene tibial bearings of the same design?**
- radiation dose
 - time from sterilization to clinical implantation (shelf life)
 - polyethylene forming resin
 - method of shaping the articular surface (e.g., machining, molding, or heat-pressing)
 - initial minimum thickness of the bearing
- 10. A sixty-five-year-old man with Type-I diabetes presents to the emergency department following a ground-level fall off a curb. He reports that he experienced immediate pain in the left ankle and was unable to walk following the injury. Examination reveals mild ecchymosis over the lateral aspect of the ankle, with tenderness both medially and laterally. Radiographic examination demonstrates a minimally displaced bimalleolar ankle fracture. Pedal pulses are absent bilaterally. Review of the medical history reveals long-standing insulin dependence and hypertension. Which of the following factors was significantly associated with the risk of complications developing following surgical management of the fracture?**
- insulin requirement
 - absence of pedal pulses
 - male sex
 - hypertension
 - bimalleolar fracture type
- 11. After plate fixation of a humeral shaft fracture in a patient who was neurologically intact before the surgery, a radial nerve paralysis is identified in the recovery room. The surgeon should:**
- return the patient immediately to the operating room for exploration
 - schedule a return to the operating room within seventy-two hours for nerve repair or tendon transfer
 - administer corticosteroids for nerve injury and check compartment pressures
 - perform nerve conduction studies and electromyography
 - provide a wrist splint and reassure the patient that the paralysis will likely resolve
- 12. Which statement best describes the current usage of recombinant human bone morphogenetic protein-2 (rhBMP-2) in clinical practice?**
- the primary concern about off-label usage of rhBMP-2 relates to inconsistent fusion rates
 - the use of rhBMP-2 for anterior lumbar interbody fusion has not yet been approved by the Food and Drug Administration (FDA)
 - there is a considerable amount of physician-directed usage of rhBMP-2 in the posterolateral aspect of the spine
 - two companies have been approved to market and produce rhBMP-2
 - Most studies regarding rhBMP-2 suggest that the resultant fusion rate is slightly lower than that following supplementation with autogenous iliac bone graft
- 13. A cardiologist stops you in the hospital corridor and asks your opinion regarding his persistent neck pain. You should:**
- briefly discuss his symptoms with him and render an opinion
 - recommend several days of analgesic medication and that he consult with you if the pain persists
 - discuss his symptoms, briefly examine him, and then render an opinion
 - have him see you in your office for a complete history, physical, and diagnostic testing
 - tell him to obtain a magnetic resonance image of the cervical spine and send the report to your office for your review
- 14. A twenty-nine-year-old male former college football player presents to you with a two-year history of progressive right knee pain. He notes a history of several right knee "sprains" that had caused him to miss a game or two but had never needed surgery. Physical examination reveals a grade-II posterior drawer with a chronic grade-I posterior sag and a mild increase of external rotation at 30° and 90°. He has no increase in varus or valgus laxity, and the Lachman test is negative when the knee is reduced. Stress radiography shows 9 mm of increased posterior tibial translation compared with that of the normal, uninjured knee. The most likely diagnosis is:**
- partial posterior cruciate ligament tear
 - complete posterior cruciate ligament tear
 - combined posterior cruciate ligament and posterolat-

- eral corner injury
 D. posterolateral corner injury
 E. posterior cruciate and anterior cruciate ligament injury
- 15. A sixty-eight-year-old woman who underwent uncomplicated total knee arthroplasty three months ago presents with swelling, erythema, incisional drainage, and increasing pain at the operative site over the past ten days. On examination, the knee is found to be diffusely swollen, warm, and tender. Motion is restricted by pain. Radiographs show the components to be in good position. Laboratory results reveal an erythrocyte sedimentation rate of 92 mm/hr, a C-reactive protein level of 75 mg/L, and a joint fluid cell count of $55,000/10^3 \text{ cm}^3$ with 96% neutrophils. Which of the following tests best confirms the presence of periprosthetic infection:**
- A. erythrocyte sedimentation rate
 B. C-reactive protein level
 C. synovial fluid cell count
 D. synovial fluid differential count
 E. combined assessment of serologic and synovial fluid values
- 16. A sixty-year-old woman who lives alone has agreed to undergo first metatarsal osteotomy. She asks you when it will be safe for her to resume driving her automobile. You tell her that, in a recent study, patients who underwent foot surgery achieved a reaction time and brake time that approached those of a control population by how many weeks postoperatively?**
- A. two
 B. four
 C. six
 D. eight
 E. twelve
- 17. A seventy-six-year-old Canadian man underwent an uncomplicated total knee arthroplasty for the treatment of osteoarthritis. On the fifth postoperative day, the patient was medically stable and the physiotherapy team deemed independent mobilization to be safe for him. He lives alone in a single-story house and has a son and daughter-in-law who live twenty minutes away. Which of the following discharge destinations was found to be associated with the best three-month functional outcome?**
- A. home with in-home physiotherapy supports
 B. inpatient rehabilitation at the same hospital
 C. inpatient rehabilitation in a freestanding facility
 D. there is no difference in outcomes between home or inpatient rehabilitation
- 18. A twenty-year-old college athlete requires anterior cruciate ligament reconstruction to play varsity tennis. His trainer has told him that double-bundle anterior cruciate ligament reconstruction at the appropriate tension provides excellent stability. You tell him that a recent in vitro study indicated that the anterior cruciate ligament reconstruction that adequately restores lateral tibial plateau displacement to normal during simulated pivot-shift testing is:**
- A. single-bundle anterior cruciate ligament reconstruction
 B. double-bundle anterior cruciate ligament reconstruction with posterolateral tension equaling anteromedial tension at 10° of flexion
 C. double-bundle anterior cruciate ligament reconstruction with posterolateral tension equaling anteromedial tension at 30° of flexion
 D. double-bundle anterior cruciate ligament reconstruction with posterolateral tension equaling anteromedial tension plus 30 N at 10° of flexion
 E. double-bundle anterior cruciate ligament reconstruction with posterolateral tension equaling anteromedial tension plus 30 N at 30° of flexion
- 19. Thirteen patients who had undergone a radial shortening osteotomy for the treatment of Kienböck disease were evaluated at a mean of twenty-one years postoperatively. Which of the following statements regarding these outcomes is true?**
- A. DASH scores were significantly better in association with radial shortening of >4 mm than they were in association with radial shortening of 2 to 3 mm
 B. DASH scores were significantly worse in cases with preoperative positive ulnar variance
 C. DASH scores were significantly better in association with Lichtman stage IIIB than they were in association with Lichtman stage II or IIIA
 D. DASH scores were significantly worse after radial shortening osteotomy than they were after conservative treatment or scaphotrapeziotrapezoidal arthrodesis
 E. progression of the Lichtman stage was noted in half of the patients
- 20. A sixty-two-year-old man presents to the spine clinic with a two-month history of back pain. It is present throughout the day and does not seem to be relieved by rest. There is no weakness in the lower limbs, and the neurologic examination of the lower limbs reveals normal findings. Last year, the patient had a positive test for occult blood in the stool; he did not attend the follow-up visit with his primary care physician. Plain radiographs and computed tomography scans of the thoracic spine show a 1 by 1-cm lytic lesion of T5. Which needle is most appropriate for performing a biopsy of this lesion?**
- A. Craig needle with an inner diameter of 3.5 mm
 B. Harlow Wood needle with an inner diameter of 3 mm
 C. Jamshidi needle with an inner diameter of 3.1 mm
 D. Ackerman needle with an inner diameter of 1.5 mm
 E. Jamshidi and Swaim needle with an inner diameter of 2 mm
- 21. A forty-two-year-old construction worker sustained a closed tibial fracture from a crush injury and underwent operative reduction and fixation with an intramedullary nail three weeks ago. He presents now with increased pain at the fracture site of one week in duration and occasional fever and shaking chills. On examination, his oral temperature is 100.5°F (40.8°C), and he has tenderness at the fracture site. There is increased warmth and erythema of the skin over the fracture. His white blood-cell count is $14.7 \times 10^9/\text{L}$, erythrocyte sedimentation rate is 60 mm/hr, and C-reactive protein level is 4.7 mg/L. Plain radiographs suggest stable fixation but no evidence of fracture-healing. Your diagnosis is infection of the fracture site. The preferred treatment plan is to institute suppressive antibiotics and:**
- A. débridement, nail removal, and splinting
 B. débridement with maintenance of the nail
 C. débridement, nail removal, and external fixation
 D. débridement and exchange nailing
- 22. A seventy-year-old woman is seen in the emergency room complaining of debilitating pain in the right lower limb after tripping on a stair, even though she did not fall. A radiograph shows a simple transverse fracture of the right femoral shaft. She has no history of cancer or diabetes. You suspect that the fracture may be associated with a medication that she has been taking. Which of the following medications has been associated with fracture:**
- A. anti-sclerostin antibody
 B. calcitonin
 C. Fosamax (alendronate sodium)
 D. vitamin E
 E. Lipitor (atorvastatin calcium)
- 23. A recent randomized trial showed no benefit from operative treatment of a disc at the lumbosacral junction (L5-S1). Which of the following statements best describes the results of discectomy compared with those of non-operative treatment in patients with upper-level disc herniation (at L2-L3 or L3-L4) relative to those with disc herniations at L5-S1?**
- A. patients with upper-level herniation were, on the average, younger than patients with L5-S1 herniation

- B. patients with upper-level herniation had significantly more surgical complications than patients with L5-S1 herniation
- C. patients with upper-level herniation had a relatively smaller benefit from surgery in large part because non-operative treatment was more effective than it was for patients with L5-S1 herniation
- D. patients with upper-level herniation had a relatively greater benefit from surgery in large part because non-operative treatment was less effective than it was for patients with L5-S1 herniation
- E. the outcomes of both surgery and nonoperative treatment for the patients with upper-level herniation were similar to those for the patients with L5-S1 herniation
- 24. A seventy-two-year-old woman presents to you for evaluation as a candidate for total hip arthroplasty because of pain in the right hip that has progressively worsened for six months. The pain is described as dull and worse with weight-bearing; it now limits her daily activities. She has a history of hypertension, controlled with a diuretic. She has no other medical problems, and the only other medication that she uses is acetaminophen, prescribed by her personal physician to relieve pain. On physical examination, the patient appears well and in no distress. Her vital signs are normal. She has a mild antalgic gait and some moderate pain on flexion/abduction/external rotation of the right hip. Radiographs of the right hip, ordered by her personal physician, reveal moderate degenerative joint disease, with substantial joint-space narrowing. Which of the following was found to be both an ethically appropriate and a time-efficient strategy for outlining potential options for treatment of the hip pain?**
- A. discussing the two most important options using words that the patient might say when considering these options
- B. discussing all possible options and providing a detailed explanation of each
- C. discussing the one most appropriate option and providing a detailed explanation of it
- D. discussing the two most important options and providing a detailed explanation of each
- E. discussing all possible options using words that the patient might say when considering these options
- 25. A sixty-three-year-old woman is seen by her orthopaedic surgeon one year after a total knee arthroplasty. The patient has no symptoms, the physical examination reveals no remarkable findings, and radiographs show a well-fixed, well-positioned total knee replacement. The surgeon recommends clinical follow-up in one year (at two years postoperatively). In a recent study, what percentage of such patients returned for a two-year follow-up evaluation?**
- A. 90% to 95%
- B. 70% to 80%
- C. 50% to 60%
- D. 30% to 40%
- E. <20%
- 26. There has been considerable variability in the definitions of fracture-healing in published reports. In a survey of the recent literature, the most common current definitions of clinical and (plain) radiographic evidence of fracture-healing were found to be the:**
- A. ability to bear weight and bridging of the fracture site by at least three cortices
- B. absence of pain or tenderness on palpation or during physical examination and obliteration of the fracture line or the presence of cortical continuity
- C. absence of pain or tenderness during weight-bearing and bridging of the fracture site by callus, trabeculae, or bone
- D. ability to walk and absence of fracture displacement
- E. full painless range of motion at the adjacent joints and calcification of the fracture callus
- 27. A forty-two-year-old man presents at a six-month follow-up visit after an open repair of an acute Achilles tendon rupture. Postoperative management consisted of early weight-bearing and exercises. There were no postoperative complications. What is the most probable impairment at six months postoperatively?**
- A. excess dorsiflexion range of motion
- B. decreased ankle plantar flexion strength
- C. decreased ankle plantar flexion endurance
- D. impaired proprioception
- 28. The number of people eighty years of age and older is increasing along with a concomitant number of octogenarians who require total hip arthroplasty. In a review of the Finnish National Arthroplasty Registry, the most common reason for revision total hip arthroplasty in this age group was found to be:**
- A. periprosthetic fracture
- B. recurrent dislocation
- C. infection
- D. aseptic loosening
- E. fracture of the prosthesis
- 29. A ninety-five-year-old woman is admitted to the hospital after a fall. She complains of right hip pain, and radiographs confirm a fracture of the femoral neck. Her family is concerned about the prognosis. You can tell them that:**
- A. she probably has comorbidities similar to those in a cohort seventy-five to eighty-nine years of age
- B. the hospital stay will be approximately the same as that in a cohort seventy-five to eighty-nine years of age
- C. if the patient lived at home prior to the injury, it is likely she will be able to resume living at home postoperatively
- D. if the patient was independently mobile before the fracture, it is likely she will be independently mobile postoperatively
- E. the mortality rate in the 120-day period following surgery is double that in a cohort seventy-five to eighty-nine years of age
- 30. Intravascular injection of particulate steroids during cervical nerve root blocks has been postulated to be a cause of catastrophic neurologic complications. In an animal experiment, adult pigs under general anesthesia underwent steroid injections into the vertebral artery with fluoroscopic guidance. Which of the following best reflects the authors' findings?**
- A. all animals that received methylprednisolone (a particulate steroid) died of intraoperative neurologic complications
- B. animals that received high doses of dexamethasone (a non-particulate steroid) recovered more slowly than those that received lower doses
- C. animals that received high doses of prednisolone (a non-particulate steroid) recovered more slowly than those that received lower doses
- D. all animals that received intra-arterial injections demonstrated some evidence of brain stem edema on magnetic resonance imaging
- 31. A forty-six-year-old man with osteoarthritis of the hip presents with pain, a limp, and stiffness. The symptoms have been resistant to medical management and physical therapy. He has been forced to dramatically reduce his level of activity in order to tolerate the symptoms. The patient is interested in hip resurfacing because he has read about it on the Internet. During a discussion of the potential complications of the procedure with the patient, the topic of femoral neck fracture comes up. Which of the following statements accurately describes the risk factors for femoral neck fracture after hip resurfacing?**
- A. the risk of femoral neck fracture is unrelated to the sex of the patient
- B. the femoral resurfacing device protects the femoral neck from excessive loads
- C. a thicker cement mantle decreases the risk of fracture
- D. notching of the femoral neck has little effect on the fracture toughness of the femoral neck
- E. multiple factors have been implicated in a higher risk

- of femoral neck fracture, including bone quality, patient activity, and the position of the resurfacing component
- 32. When tibial lengthening with use of an Ilizarov external fixator over an intramedullary nail was compared with the conventional Ilizarov method, the authors found that:**
- the quality of new bone formation was superior in the intramedullary nail group
 - there were more complications in the intramedullary nail group
 - the duration of external fixation was shorter in the intramedullary nail group
 - valgus axial deviation was similar in the two groups
- 33. An eight-year-old girl has a two-week history of neck pain and torticollis. The neck pain has been continuous and is progressively increasing with no history of cervical trauma. The patient is afebrile, and the neurological examination reveals no abnormality. Radiographs show a lateral tilt of the cervical spine, with an acceptable sagittal alignment. A computed tomography scan reveals an osteolytic lesion in the left lateral mass of the atlas. A percutaneous fine-needle biopsy is performed, and the result confirms a diagnosis of Langerhans cell histiocytosis. A complete skeletal survey excludes other lesions. On the basis of the literature and the results in this case report, what is the most reasonable first treatment for this patient?**
- chemotherapy and immobilization with a stiff cervical collar
 - radiation therapy and immobilization with a halo vest
 - posterior occipitocervical fixation
 - immobilization with a stiff cervical collar
 - open curettage of the lesion and immobilization with a halo vest
- 34. In the largest published study of intraoperative femoral fractures at the time of revision total hip arthroplasty with use of an extensively coated femoral stem, the operative goal of which was stable diaphyseal fixation, the risk factors for intraoperative fracture were all of the following except:**
- substantial bone loss
 - a low ratio between the cortical and canal diameters
 - underreaming of the femoral canal
 - use of an extended greater trochanteric osteotomy
 - use of a large-diameter stem
- 35. The use of rhBMP-2 as a substitute for iliac crest autograft in lumbar spine fusion surgery is increasing. Numerous clinical studies have demonstrated good clinical and radiographic success after use of rhBMP-2 in various lumbar spine fusion procedures. Currently, the only indication for which rhBMP-2 is approved by the United States Food and Drug Administration for use in the lumbar spine is:**
- transforaminal lumbar interbody fusion with an interbody cage
 - posterolateral lumbar fusion with pedicle screw fixation
 - posterior lumbar interbody fusion with an interbody cage
 - anterior lumbar interbody fusion with a titanium cage
 - combined anterior lumbar interbody fusion and posterolateral lumbar fusion
- 36. The use of a regional nerve block for analgesia following joint replacement surgery in the presence of anticoagulant prophylaxis has been shown to:**
- cause more nerve palsy
 - be ineffective, in contrast with the use of systemic narcotic analgesia
 - not be associated with hematoma formation at the site of the nerve block
 - be associated with more of a risk of hematoma formation at the site of the nerve block if low-molecular-weight heparin is used
 - be associated with more of a risk of local bleeding unless anticoagulation is withheld for twenty-four hours after the nerve block
- 37. An eighty-year-old man who lives independently sustained an intracapsular fracture of the right femoral neck. He is admitted to the hospital, but operative intervention is delayed. A delay beyond thirty-six hours after admission is associated with an increased prevalence of all but which of the following?**
- mortality
 - pressure sores
 - length of hospital stay
 - inability to return to independent living
- 38. A seventy-five-year-old retired mechanical engineer requests that a cemented femoral stem be used for his imminent total hip arthroplasty and asks for information about whether a polished or precoated stem is preferable. You can tell him that, in a recent prospective randomized study comparing precoated and polished cemented femoral components at a mean of 5.3 years postoperatively, there was:**
- a greater number of periprosthetic fractures with the precoated components
 - a greater number of dislocations with the polished components
 - a higher rate of periprosthetic osteolysis with the polished components
 - no difference in the rates of revision or loosening at five years
 - more polyethylene wear with the precoated components
- 39. A seventy-three-year-old man returned for a follow-up examination sixteen years after a left primary total knee arthroplasty. Standing anteroposterior and lateral radiographs of the knee revealed good alignment of the components in both planes but <2 mm of polyethylene thickness remaining in the central articular portion of the medial compartment of a polyethylene tibial insert that was originally 8 mm thick. Which of the following best explains these findings?**
- inadequate release of tight medial soft-tissue structures
 - alignment of the limb in >6° of mechanical (hip-knee-ankle) varus
 - use of a polyethylene tibial bearing that was not irradiated
 - use of a polyethylene tibial bearing that was sterilized with gamma radiation in air
 - use of a femoral component with an excessively rough articular surface
- 40. A healthy thirty-five-year-old man sustained a closed isolated humeral fracture in a bicycle accident. Radiographs show the fracture pattern to be a spiral wedge with a butterfly fragment extending over about 5 cm of the midpart of the diaphysis. The best method of treatment to prevent a nonunion is:**
- a hanging arm cast and sling
 - a functional fracture brace and early motion
 - a dynamic compression plate at least ten holes in length
 - a locking plate engaging at least eight cortices
 - locked intramedullary nail
- 41. A sixty-seven-year-old osteoporotic woman presents with chronic ankle pain. Plain radiographs demonstrate extensive subtalar arthritis. You determine that a subtalar arthrodesis will provide the best relief. The greatest advantage of using computer-assisted surgery for the subtalar arthrodesis instead of a fluoroscopically guided, conventional technique is:**
- reduced exposure of the patient to radiation
 - increased accuracy of screw placement, maximizing fusion rates
 - decreased procedure time and time under anesthesia
 - increased first-pass guidewire accuracy, especially in osteoporotic patients
 - both A and D
- 42. A patient presents with pain with flexion of the ring finger as well as occasional locking. Physical examination reveals a tender nodule over the A1 pulley and pain with**

- passive stretch. A diagnosis of stenosing tenosynovitis is made, and a corticosteroid injection is offered as initial treatment. Which of the following conditions is likely to be associated with a recurrence of symptoms after injection?**
- duration of symptoms of greater than six months
 - insulin-dependent diabetes mellitus
 - non-insulin-dependent diabetes mellitus
 - carpal tunnel syndrome
 - a locked digit at the time of presentation
- 43. A thirty-six-year-old man is brought to the emergency department with an open right tibial and fibular fracture after a motor-vehicle accident. There is a 10-cm open wound on the medial aspect of the tibia. The neurovascular examination shows normal findings. Radiographs of the right tibia show comminuted fractures of the middle thirds of the tibia and fibula. You tell the family that five commonly used lower-extremity injury severity scoring systems (MESS, LSI, PSI, NISSA, and HFS-98) were evaluated in a large prospective study to determine if they could predict functional outcome after limb salvage. The results indicated that:**
- increasing scores on all of the lower-extremity injury severity scoring systems were associated with worsening functional outcome scores
 - only the scores on the LSI were significantly associated with functional outcomes
 - the functional recovery of patients who undergo a successful limb reconstruction cannot be predicted from the scores on lower-extremity injury severity scoring systems
 - lower-extremity injury severity scores are only predictive of short-term (six-month) functional outcomes
- 44. A thirty-five-year-old man has axial back pain that is worse with activities requiring lumbar spine flexion. He has no radicular leg symptoms or symptoms of claudication or stenosis. A black disc at the L5-S1 level is seen on T2-weighted magnetic resonance images, and a discogram elicits concordant 8/10 pain at the L5-S1 level. What molecular pathway(s) best explains the etiology of the disease process?**
- vascular invasion mediated by vascular endothelial growth factor (VEGF) and fibroblast growth factor (FGF)
 - matrix destruction by metalloproteinases
 - dysregulated cytokine signaling due to matrix destruction
 - all of the above
- 45. A nineteen-year-old man presents six weeks after sustaining a right knee injury while playing tackle football with some friends. He reports pain and instability with walking and other activities of daily living. Assessment of gait reveals no varus thrust. Physical examination reveals a 3+ posterior drawer, stability on Lachman testing, and increased external rotation at 30° and 90° of flexion. There is increased varus laxity at 0° that increases further at 30° of flexion. The most appropriate management to correct the knee stability should include a:**
- double-bundle posterior cruciate ligament reconstruction
 - single-bundle posterior cruciate ligament reconstruction
 - lateral collateral ligament and posterior cruciate ligament reconstruction
 - posterior cruciate ligament, lateral collateral ligament, and posterolateral corner reconstruction
- 46. Validated health-related quality-of-life measures have become important standards in the evaluation of the outcomes of lumbar spine surgery. Patients who have obtained a substantial clinical benefit one year after lumbar spine arthrodesis and report that their current health is "much better" than it was a year ago will probably have an Oswestry Disability Index raw score of at least:**
- 6.5 points
 - 10.4 points
 - 25.8 points
 - 31.3 points
- 47. Over the past nine years, surgeons who participated in the American Board of Orthopaedic Surgery (ABOS) Part-II certification examination have demonstrated a shift in practice pattern to currently favor open treatment rather than percutaneous fixation of fractures of the distal part of the radius. A review of the ABOS database suggested that this trend may be explained by all of the following, except:**
- the introduction, and reported good results, of volarly inserted locked plates in the treatment of distal radial fractures
 - the possibility that more recent graduates are being trained preferentially in open reduction and plate fixation techniques for distal radial fractures
 - the ease of patient care when fractures are treated with open techniques
 - higher physician reimbursement for the open procedure
- 48. A sixty-seven-year-old man presents to you with a six-month history of progressively worsening right hip pain seven years after undergoing a right total hip arthroplasty without cement for osteoarthritis. He does not recall any history of trauma. The well-healed lateral incision shows no signs of infection. Plain radiographs demonstrate no evidence of fracture, gross malposition, wear, loosening, periprosthetic lysis, or change in component position. A laboratory work-up reveals an erythrocyte sedimentation rate of 59 mm/hr and a C-reactive protein level of 35 mg/dL. You suspect a diagnosis of infection. An aspiration is unsuccessful in producing sufficient fluid for analysis. During revision surgery, which of the following, in combination with the preoperative erythrocyte sedimentation rate and C-reactive protein values, would provide the highest combined sensitivity, specificity, positive predictive value, negative predictive value, and accuracy for predicting the presence of infection?**
- intraoperative Gram stain showing rare gram-positive cocci
 - intraoperative frozen section showing an average of 12 polymorphonuclear cells per high-power field
 - intraoperative synovial fluid white blood-cell count of 3400 cells/mL
 - intraoperative synovial fluid white blood-cell count differential of 85% polymorphonuclear cells
- 49. Kocher-Lorenz-type fractures of the capitellum are characterized by:**
- coronal shear fractures about the capitellum that may contain a portion of the lateral crista of the humeral trochlea
 - articular shear fractures of the distal part of the humerus that contain little or no subchondral bone
 - an ability to be treated with newer locking-plate designs of internal fixation
 - a change in the carrying angle of the elbow
 - articular shear fractures of the distal part of the humerus that have a substantial portion of cancellous bone from the capitellum attached
- 50. Controversy remains about whether specialty orthopaedic hospitals provide superior care to patients when compared with general hospitals. A recent study demonstrated that, for total joint arthroplasty surgery:**
- specialty hospitals do not provide better care than general hospitals
 - general hospitals have more lower-risk patients than specialty hospitals
 - more joint arthroplasty operations are performed in general hospitals than in specialty hospitals
 - specialty hospitals have fewer adverse outcomes than general hospitals
 - the difference between specialty hospitals and general hospitals is no longer significant when adjusted for patient comorbidities and surgical volume

RESPONSE FORM

EXAMINATION EVALUATION

Did the July 2008 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of spine and total hip surgery? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of spine and hip disease? Yes No
3. Make you aware of new advances in orthopaedic surgical techniques and technology? Yes No

Comments (please comment on the quality of the questions and their relationship to your practice): _____

*Note: These objectives will change every quarter.

SURVEY (optional)

1. Which of the following best describes your practice type?
 - General orthopaedics
 - General orthopaedics with subspecialty interest
 - Exclusively subspecialty
 - Resident or student
 - Researcher
 - Other: _____
2. What are your specialty interests? Please rank in order of importance (1 = highest importance).

____ Adult	____ Spine
____ Geriatric	____ Hand
____ Pediatric	____ Rheumatology
____ Rehabilitation	____ Foot and Ankle
____ Sports	____ Other: _____
____ Trauma	
3. Which is your number-one priority to read when you receive *The Journal* (American volume only) each month?
 - Commercial advertising
 - Current Concepts
 - Classified advertising
 - Letters to The Editor
 - Clinical scientific articles
 - Basic scientific articles
 - Orthopaedic Forum
 - Instructional Course Lectures

ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the American Academy of Orthopaedic Surgeons (AAOS) and *The Journal of Bone and Joint Surgery* (JBJS). The AAOS is accredited by the ACCME to provide continuing medical education for physicians. The AAOS designates this educational activity for up to 10 hours of category-1 credit toward the AMA Physicians' Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

The deadline to submit your answers for grading this set of questions is January 15, 2009.

QUESTIONS?

For payment questions, contact the Subscription Department at 781-449-9780, x1240. For questions regarding submitted tests, contact Melissa Viola at 781-449-9780, x1224. E-mail all other questions to cme@jbjs.org.

ANSWER KEY

Black out the correct answers

- | | | |
|---------------|---------------|---------------|
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| 3. A B C D E | 20. A B C D E | 37. A B C D |
| 4. A B C D | 21. A B C D | 38. A B C D E |
| 5. A B C D E | 22. A B C D E | 39. A B C D E |
| 6. A B C D E | 23. A B C D E | 40. A B C D E |
| 7. A B C D E | 24. A B C D E | 41. A B C D E |
| 8. A B C D E | 25. A B C D E | 42. A B C D E |
| 9. A B C D E | 26. A B C D E | 43. A B C D |
| 10. A B C D E | 27. A B C D | 44. A B C D |
| 11. A B C D E | 28. A B C D E | 45. A B C D |
| 12. A B C D E | 29. A B C D E | 46. A B C D |
| 13. A B C D E | 30. A B C D | 47. A B C D |
| 14. A B C D E | 31. A B C D E | 48. A B C D |
| 15. A B C D E | 32. A B C D | 49. A B C D E |
| 16. A B C D E | 33. A B C D E | 50. A B C D E |
| 17. A B C D | 34. A B C D E | |

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