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CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

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THE DEADLINE TO SUBMIT YOUR ANSWERS FOR GRADING THIS SET OF QUESTIONS WAS JANUARY 15, 2006.

- 1. A nineteen-year-old man runs his motorcycle off the road and sustains a Grade-III open fracture of the tibia with gross contamination of the wound. When you take him to the operating theater for débridement and irrigation of the fracture, you must decide which irrigation fluid to use. Which of the following is true:**

- A. compared with an unsterile soap solution, antibiotic additives lower the risk of infection
- B. compared with an unsterile soap solution, antibiotic additives lower the risk of nonunion
- C. compared with an unsterile soap solution, antibiotic additives raise the risk of wound-healing problems**
- D. compared with antibiotic additives, an unsterile soap solution raises the risk of resistant organisms in wound infection
- E. compared with antibiotic additives, an unsterile soap solution lowers the risk of venous thrombosis

Anglen JO. Comparison of soap and antibiotic solutions for irrigation of lower-limb open fracture wounds. A prospective, randomized study. *J Bone Joint Surg Am.* 2005;87:1415.

- 2. Which of the following is the best combination of tests for diagnosing a full-thickness rotator cuff tear?**

- A. speed test, supraspinatus muscle test, and painful arc sign
- B. Neer impingement sign, supraspinatus muscle test, and painful arc sign
- C. infraspinatus muscle test, drop-arm sign, and painful arc sign**
- D. infraspinatus muscle test, relocation test, and painful arc sign
- E. weakness in internal rotation, Hawkins-Kennedy impingement sign, and Speed test

Park HB, Yokota A, Gill HS, Rassi GE, McFarland EG. Diagnostic accuracy of clinical tests for the different degrees of subacromial impingement syndrome. *J Bone Joint Surg Am.* 2005;87:1446.

- 3. Which of the following factors has been suggested to explain the substantially greater revision burden for hip arthroplasty in the United States compared with that in Sweden?**

- A. difference in hip implant designs
- B. difference in implant survivorship in the elderly population**
- C. increased rate of implantation in younger patients in the United States
- D. difference in gender breakdown in the installed base (patient population)
- E. increasing obesity rate in the United States

Kurtz S, Mowat F, Ong K, Chan N, Lau E, Halpern M. Prevalence of primary and revision total hip and knee arthroplasty in the United States from 1990 through 2002. *J Bone Joint Surg Am.* 2005;87:1487.

- 4. Which of the following results of pulmonary function testing should be expected in a patient who underwent posterior spinal fusion with iliac crest bone graft to treat adoles-**

- cent idiopathic scoliosis five years earlier?**

- A. worsened absolute values and percent-predicted values
- B. worsened absolute values and improved percent-predicted values
- C. improved absolute values and worsened percent-predicted values
- D. improved absolute values and unchanged percent-predicted values**
- E. unchanged absolute values and percent-predicted values

Kim YJ, Lenke LG, Bridwell KH, Kim KL, Steger-May K. Pulmonary function in adolescent idiopathic scoliosis relative to the surgical procedure. *J Bone Joint Surg Am.* 2005;87:1534.

- 5. An immunohistochemical study showed that the tendon of the long head of the biceps in humans contains a network of sensory and sympathetic nerve fibers. This type of innervation:**

- A. is associated with blood vessels
- B. is distributed evenly throughout the tendon
- C. is found predominantly near its insertion**
- D. plays a clear and distinctive role in the pathogenesis of shoulder pain
- E. is hypothesized to be unrelated to neurogenic inflammation

Alpantaki K, McLaughlin D, Karagogeos D, Hadjipavlou A, Kontakis G. Sympathic and sensory neural elements in the tendon of the long head of the biceps. *J Bone Joint Surg Am.* 2005;87:1580.

- 6. In 2004, the Seventh American College of Chest Physicians Conference on Antithrombotic and Thrombolytic Therapy gave a Grade-1A rating to which of the following thromboprophylactic measures for total knee arthroplasty and total hip arthroplasty?**

- A. aspirin, 325 mg daily
- B. warfarin therapy with a target international normalized ratio of 1.5 to 2.0
- C. low-molecular-weight heparin for three days
- D. mechanical prophylaxis and aspirin
- E. warfarin therapy with a target international normalized ratio of 2.0 to 3.0**

Archibeck MJ, White RE Jr. Specialty update. What's new in adult reconstructive knee surgery. *J Bone Joint Surg Am.* 2005;87:1656.

- 7. In a comparison of nondiabetic and diabetic patients who underwent surgical intervention for an ankle fracture, diabetic patients were found to have an increased:**

- A. mortality rate
- B. rate of postoperative complications
- C. length of hospital stay
- D. cost of hospital stay
- E. all of the above**

Ganesh SP, Pietrobon R, Cecilio WAC, Pan D, Lightdale N, Nunley JA. The impact of diabetes on patient outcomes after ankle fracture. *J Bone Joint Surg Am.* 2005;87:1712.

- 8. When a group of patients who underwent revision total hip arthroplasty because of in-**

- fection was compared with patients who underwent revision total hip arthroplasty because of aseptic loosening, the only significant difference between the groups was:**
- body mass index
 - APR-DRG SOI (severity-of-illness score)
 - estimated blood loss**
 - acetabular and femoral bone loss
 - operative time
- Bozic KJ, Ries MD. The impact of infection after total hip arthroplasty on hospital and surgeon resource utilization. *J Bone Joint Surg Am.* 2005;87:1746.
- 9. At the time of a two-year follow-up, patients with rheumatoid arthritis who had undergone repair of a rotator cuff tear were found to have:**
- disabling pain and poor function
 - a return to overhead activities
 - advancing arthritis necessitating arthroplasty
 - adequate pain relief and satisfaction with the shoulder**
 - elevation strength equal to that of the untreated shoulder
- Smith AM, Sperling JW, Cofield RH. Rotator cuff repair in patients with rheumatoid arthritis. *J Bone Joint Surg Am.* 2005;87:1782.
- 10. A twenty-nine-year-old woman is thrown from the back of a motorcycle and sustains a Grade-IIIC lower-limb injury with vascular disruption at the level of the middle and proximal thirds of the tibia. Which of the following statements is most true regarding the effect of the level of amputation on ultimate functional outcome:**
- a through-the-knee level is better than an above-the-knee level
 - a through-the-knee level is equivalent to an above-the-knee level
 - a below-the-knee level is better than an above-the-knee level
 - a below-the-knee level is equivalent to a through-the-knee level
 - a through-the-knee level is worse than either a below-the-knee or an above-the-knee level**
- MacKenzie EJ, Bosse MJ, Pollak AN, Webb LX, Swionkowski MF, Kellam JF, Smith DG, Sanders RW, Jones AL, Starr AJ, McAndrew MP, Patterson BM, Burgess AR, Castillo RC. Long-term persistence of disability following severe lower-limb trauma. Results of a seven-year follow-up. *J Bone Joint Surg Am.* 2005;87:1801.
- 11. A fourteen-year-old boy presents with a six-month history of left hip pain and limp. The findings of the radiographic evaluation are consistent with a diagnosis of monostotic fibrous dysplasia involving the femoral neck with evidence of a fatigue fracture. Which of the following bone-graft options would be the most appropriate for improving the mechanical strength of the femoral neck?**
- demineralized bone matrix
 - cortical allograft**
 - cancellous allograft
 - cortical autograft
 - cancellous autograft
- DiCaprio MR, Enneking WF. Current concepts review. Fibrous dysplasia. Pathophysiology, evaluation, and treatment. *J Bone Joint Surg Am.* 2005;87:1848.
- 12. In a study of patients with adolescent idiopathic scoliosis, which of the following was found to be associated with the greatest adverse effect on pulmonary function?**
- magnitude of the thoracic Cobb angle
 - length of the thoracic curve (number of vertebrae within the curve)**
 - thoracic hypokyphosis
 - coronal imbalance
 - curve rigidity
- Newton PO, Faro FD, Gollogly S, Betz RR, Lenke LG, Lowe TG. Results of preoperative pulmonary function testing of adolescents with idiopathic scoliosis. A study of six hundred and thirty-one patients. *J Bone Joint Surg Am.* 2005;87:1937.
- 13. A newly developed lower-extremity activity scale was found to:**
- obviate the need for patient-reported outcomes
 - require the use of a pedometer by the patient
 - be specifically applicable to arthritic patients**
 - be more difficult to interpret than the WOMAC or SF-36
 - await validation
- Saleh KJ, Mulhall KJ, Bershadsky B, Ghomrawi HM, White LE, Buyea CM, Krackow KA. Development and validation of a lower-extremity activity scale. Use for patients treated with revision total knee arthroplasty. *J Bone Joint Surg Am.* 2005;87:1985.
- 14. When describing prosthetic elbow joint replacement, the term constraint refers to:**
- laxity of the articulation
 - physical linkage between the components
 - geometric conformity of the components
 - biomechanical resistance to relative motion between the components**
 - a sloppy hinge
- Kamineni S, O'Driscoll SW, Urban M, Garg A, Berglund L, Morrey BF, An KN. Intrinsic constraint of unlinked total elbow replacements—the ulnotrochlear joint. *J Bone Joint Surg Am.* 2005;87:2019.
- 15. Which deep-vein-thrombosis prophylaxis agent functions primarily by directly inhibiting factor-XA activity?**
- warfarin
 - aspirin
 - fondaparinux
 - low-molecular-weight heparin**
 - standard unfractionated heparin
- Lieberman JR, Hsu WK. Current concepts review. Prevention of venous thromboembolic disease after total hip and knee arthroplasty. *J Bone Joint Surg Am.* 2005;87:2097.
- 16. Metal-on-metal articulation has been used as a bearing surface in total hip arthroplasty. Which of the following statements is correct?**
- a metal-on-metal articulation generates no wear particles

- B. implant fixation is more durable with a metal-on-metal articulation than with a metal-on-polyethylene coupling
- C. serum ion levels increase with increased patient activity
- D. histological evidence of hypersensitivity reaction has been observed in tissues retrieved from hips with a metal-on-metal articulation**
- E. there is an increase in neoplasia in patients with a metal-on-metal articulation
- Huo MH, Gilbert NF. Specialty update. What's new in hip arthroplasty. *J Bone Joint Surg Am.* 2005;87:2133.
- 17. When performing total knee arthroplasty, the orthopaedic surgeon must decide whether or not to resurface the patella. Which of the following statements is most consistent with the results found in a recent meta-analysis?**
- A. patellar resurfacing increases the risk of a reoperation and increases the prevalence of postoperative anterior knee pain
- B. patellar resurfacing decreases the risk of a reoperation only in the short term (less than five years postoperatively)
- C. data derived from the available trials show no difference in the rate of reoperations and the prevalence of postoperative anterior knee pain between resurfacing and nonresurfacing of the patella
- D. the mean improvement in the various knee scores is significantly greater when the patella is resurfaced
- E. patellar resurfacing decreases the risk of a reoperation and decreases the prevalence of postoperative anterior knee pain**
- Pakos EE, Ntzani EE, Trikalinos TA. Patellar resurfacing in total knee arthroplasty. A meta-analysis. *J Bone Joint Surg Am.* 2005;87:1438.
- 18. When compared with a patient of normal weight, an obese patient (body mass index of >30) undergoing surgery for acetabular fracture was most at risk for which of the following complications?**
- A. iatrogenic nerve injury
- B. wound infection**
- C. deep venous thrombosis
- D. heterotopic ossification
- E. pulmonary embolism
- Karunakar MA, Shah SN, Jerabek S. Body mass index as a predictor of complications after operative treatment of acetabular fractures. *J Bone Joint Surg Am.* 2005;87:1498.
- 19. Which of the following is the most important factor in predicting the future extent of pelvic osteolysis adjacent to a cementless acetabular cup?**
- A. type of communication pathway between the lesion and the joint space**
- B. usage of screws
- C. number of screw holes
- D. location of the lesion
- E. presence of cortical erosion
- Kitamura N, Naudie DDR, Leung SB, Hopper RH Jr, Engh CA Sr. Diagnostic features of pelvic osteolysis on computed tomography: the importance of communication pathways. *J Bone Joint Surg Am.* 2005;87:1542.
- 20. The nitrogen-containing bisphosphonates primarily exert their effectiveness by what mechanism?**
- A. direct cell death
- B. accumulation of cytotoxic ATP analogues
- C. inhibition of the mevalonate pathway**
- D. inhibition of cyclooxygenase
- E. formation of breaks in double-stranded DNA
- Morris CD, Einhorn TA. Current concepts review. Bisphosphonates in orthopaedic surgery. *J Bone Joint Surg Am.* 2005;87:1609.
- 21. A seventy-four-year-old woman who lives independently sustained a displaced femoral neck fracture after a simple fall at the golf course. She has mild hypertension but is otherwise healthy. If you perform internal fixation rather than a total hip replacement, which of the following outcome measures would be most likely?**
- A. a better possibility of independent living
- B. better hip function
- C. a reduced risk of hip complications
- D. an increased risk of revision surgery**
- E. a better quality of life
- Blomfeldt R, Törnkvist H, Ponzer S, Söderqvist A, Tidermark J. Comparison of internal fixation with total hip replacement for displaced femoral neck fractures. Randomized, controlled trial performed at four years. *J Bone Joint Surg Am.* 2005;87:1680.
- 22. In an analysis of published studies of the outcomes of total knee arthroplasty, the most common study design was:**
- A. preoperative/postoperative analyses with little case-mix adjustment**
- B. complex multivariate analyses
- C. systematic prospective studies with intact cohorts
- D. randomized clinical trials
- E. a design that could address differences across surgeons and settings
- Kane RL, Saleh KJ, Wilt TJ, Bershadsky B. The functional outcomes of total knee arthroplasty. *J Bone Joint Surg Am.* 2005;87:1719.
- 23. In a study comparing treatment with external fixation with treatment with an elastic stable intramedullary nail in children who sustained a tibial fracture, the children who had the latter procedure were found to have:**
- A. a higher rate of union
- B. a shorter time to union**
- C. a higher prevalence of residual deformity
- D. worse functional scores
- E. less patient satisfaction
- Kubiak EN, Egol KA, Scher D, Wasserman B, Feldman D, Koval KJ. Operative treatment of tibial fractures in children: are elastic stable intramedullary nails an improvement over external fixation?. *J Bone Joint Surg Am.* 2005;87:1761.

- 24. Which of the following is the most important factor in the evaluation of peroneal tendon pathology with diagnostic ultrasound?**
- low cost
 - low-frequency transducers
 - ability to perform color Doppler imaging
 - experience of the operator**
 - ability to differentiate peroneal tendon tears from ligament injuries
- Grant TH, Kelikian AS, Jereb SE, McCarthy RJ. Ultrasound diagnosis of peroneal tendon tears. A surgical correlation. *J Bone Joint Surg Am.* 2005;87:1788.
- 25. When patients who underwent hip hemiarthroplasty because of a neoplasm of the proximal part of the femur were compared with patients who underwent the same procedure for any other diagnosis, the dislocation rate at ten years postoperatively was found to be:**
- ten times higher in the neoplasm group
 - five times higher in the neoplasm group**
 - two times higher in the non-neoplasm group
 - five times higher in the non-neoplasm group
 - equal between the two groups
- Schneiderbauer MM, Sierra RJ, Schleck C, Harmsen WS, Scully SP. Dislocation rate after hip hemiarthroplasty in patients with tumor-related conditions. *J Bone Joint Surg Am.* 2005;87:1810.
- 26. Following triple arthrodesis, additional procedures are sometimes needed to fully correct acquired adult flatfoot deformity. Which of the following adjunctive procedures would help correct residual forefoot varus?**
- calcaneocuboid distraction arthrodesis
 - medial displacement calcaneal osteotomy
 - plantar flexion opening wedge osteotomy of the first cuneiform**
 - flexor digitorum longus tendon transfer
 - peroneus longus tendon transfer
- Johnson JE, Yu JR. Instructional course lecture. Arthrodesis techniques in the management of stage-II and III acquired adult flatfoot deformity. *J Bone Joint Surg Am.* 2005;87:1865.
- 27. In a meta-analysis of four randomized clinical trials that compared the results of hemiarthroplasty with those of total shoulder arthroplasty in patients with degenerative arthritis of the shoulder, the authors found that, at a minimum of two years postoperatively:**
- total shoulder arthroplasty yielded superior functional results**
 - hemiarthroplasty yielded superior functional results
 - there was no significant difference between the groups regarding functional results
 - the hemiarthroplasty group had significantly less pain
 - the durability of the results at two years can be expected to be maintained at five years
- Bryant D, Litchfield R, Sandow M, Gartsman GM, Guyatt G, Kirkley A. A comparison of pain, strength, range of motion, and functional outcomes after hemiarthroplasty and total shoulder arthroplasty in patients with osteoarthritis of the shoulder. A systematic review and meta-analysis. *J Bone Joint Surg Am.* 2005;87:1947.
- 28. The use of patient-derived outcome scales has become increasingly prevalent for the evaluation of the results of hip and knee arthroplasty. When the physical component summary score of the SF-36 was compared with outcomes instruments that were disease-specific, the SF-36 was found to have:**
- responsiveness similar to that of disease-specific instruments**
 - better validity than disease-specific instruments
 - a lower ceiling effect than disease-specific instruments
 - good subjective validity, but the SF-36 must be used with a disease-specific instrument
 - underestimated patient satisfaction
- Marx RG, Jones EC, Atwan NC, Closkey RF, Salvati EA, Sculco TP. Measuring improvement following total hip and knee arthroplasty using patient-based measures of outcome. *J Bone Joint Surg Am.* 2005;87:1999.
- 29. Which of the following statements regarding platelet-derived growth factor is most true?**
- it has not been shown to improve healing in any tissue except bone
 - it might increase the pool of undifferentiated mesenchymal cells in an ectopic muscle site, but the osteoinductive factors in demineralized bone matrix may not be present in sufficient quantity to move the cells into the endochondral pathway**
 - neither platelet-derived growth factor nor any other growth factor has been shown to augment the osteoinductive properties of demineralized bone matrix
 - platelet-derived growth factor must be combined with the other growth factors in PRP before it becomes osteoinductive
 - only osteoblasts and osteoclasts are responsive to platelet-derived growth factor
- Ranly DM, McMillan J, Keller T, Lohmann CH, Meunch T, Cochran DL, Schwartz Z, Boyan BD. Platelet-derived growth factor inhibits demineralized bone matrix-induced intramuscular cartilage and bone formation. A study of immunocompromised mice. *J Bone Joint Surg Am.* 2005;87:2052.
- 30. Which nerve is at greatest risk of injury when an anterolateral portal is being established for arthroscopic surgery of the elbow?**
- radial nerve**
 - ulnar nerve
 - median nerve
 - anterior interosseous nerve
 - lateral antebrachial cutaneous nerve
- Steinmann SP, King GJW, Savoie FH III. Instructional course lecture. Arthroscopic treatment of the arthritic elbow. *J Bone Joint Surg Am.* 2005;87:2113.
- 31. In a study comparing the ultimate range of motion in patients undergoing total knee arthroplasty with either a standard or a high-flexion posterior stabilized prosthesis, all of the following were thought to contribute to an excellent range except:**
- female gender and low body mass index

- B. use of the subvastus approach
- C. a good preoperative range of motion
- D. restoration of the joint line
- E. restoration of the posterior femoral condylar offset

Kim Y-H, Sohn K-S, Kim J-S. Range of motion of standard and high-flexion posterior stabilized total knee prostheses. A prospective, randomized study. *J Bone Joint Surg Am.* 2005;87:1470.

- 32. A sixty-three-year-old man who underwent a second-generation metal-on-metal total hip replacement eighteen months ago complains of pain in the right hip. Radiographs show a large femoral osteolytic lesion with a risk of fracture through the greater trochanter. The retrieved periprosthetic tissues from a revision operation show a perivascular accumulation of T-lymphocytes and macrophages and an absence of both particle-laden macrophages and polymorphonuclear cells. Which of the following is the most plausible mechanism responsible for the periprosthetic bone loss?**
- A. periprosthetic infection
 - B. metal-particle-induced osteolysis
 - C. osteolysis secondary to joint fluid pressure stress-shielding in the proximal part of the femur
 - D. hypersensitivity reaction to metal

Park Y-S, Moon Y-W, Lim S-J, Yang J-M, Ahn G, Choi Y-L. Early osteolysis following second-generation metal-on-metal hip replacement. *J Bone Joint Surg Am.* 2005;87:1515.

- 33. Bisphosphonate therapy has been shown to be beneficial in the management of all of the following skeletal conditions except:**
- A. adult osteonecrosis
 - B. hypercalcemia of malignancy
 - C. Paget disease
 - D. steroid-induced osteoporosis
 - E. osteogenesis imperfecta

Morris CD, Einhorn TA. Current concepts review. Bisphosphonates in orthopaedic surgery. *J Bone Joint Surg Am.* 2005;87:1609.

- 34. According to an analysis of published studies of the outcomes of total knee arthroplasty, the functional outcomes of the procedure can best be described as:**

- A. consistently positive but having a greater effect size when the outcome measures are derived from surgeons than when they are derived from patients
- B. emphasizing quality-of-life issues
- C. consistently collected with the use of common measures
- D. better for younger patients
- E. better for thin patients than for obese patients

Kane RL, Saleh KJ, Wilt TJ, Bershadsky B. The functional outcomes of total knee arthroplasty. *J Bone Joint Surg Am.* 2005;87:1719.

- 35. It has been claimed that zirconia ceramics have better mechanical strength and wear**

performance than alumina ceramics. Which of the following factors may limit the clinical usefulness of zirconia ceramics?

- A. surface roughness
- B. phase transformation
- C. poor fracture toughness
- D. poor lubrication
- E. poor thermoconductivity

Kim Y-H. Comparison of polyethylene wear associated with cobalt-chromium and zirconia heads after total hip replacement. A prospective, randomized study. *J Bone Joint Surg Am.* 2005;87:1769.

- 36. After penetration into Durasul highly cross-linked polyethylene had reached a steady rate, the annual penetration rate was found to be what percentage of the penetration rate of conventional ultra-high molecular weight polyethylene?**

- A. 10%
- B. 25% to 40%
- C. 55%
- D. 80%
- E. 100%

Dorr LD, Wan Z, Shahrardar C, Sirianni L, Boutary M, Yun A. Clinical performance of a Durasul highly cross-linked polyethylene acetabular liner for total hip arthroplasty at five years. *J Bone Joint Surg Am.* 2005;87:1816.

- 37. With regard to the development and prognosis of spondylolisthesis, the term "pelvic incidence" is defined as:**

- A. the same as sacral slope
- B. the same as pelvic tilt
- C. independent of sacral slope
- D. independent of pelvic tilt
- E. the sum of sacral slope and pelvic tilt

Bridwell KH, Anderson PA, Boden SD, Vaccaro AR, Wang JC. Specialty update. What's new in spine surgery. *J Bone Joint Surg Am.* 2005;87:1892.

- 38. A seventy-year-old patient who is generally healthy is scheduled to have a total hip replacement next week. The patient and his family want to know what to expect in terms of short-term and longer-term mortality. You should tell them that, compared with patients of the same age who do not have hip replacement, patients who have hip replacement have:**

- A. essentially the same survival at one month, one year, and five years after surgery
- B. better survival at one month, one year, and five years after surgery
- C. worse survival at one month, one year, and five years after surgery
- D. worse survival at one month but better survival at one year and five years after surgery
- E. better survival at one month but worse survival at one year and five years after surgery

Barrett J, Losina E, Baron JA, Mahomed NN, Wright J, Katz JN. Survival following total hip replacement. *J Bone Joint Surg Am.* 2005;87:1965.

39. The American Shoulder and Elbow Surgeons (ASES) subjective shoulder scale demonstrates:

- A. acceptable reliability, validity, and responsiveness for patients with shoulder instability and rotator cuff disease, but unacceptable performance for patients with glenohumeral arthritis
- B. acceptable reliability and responsiveness for patients with shoulder instability, rotator cuff disease, and glenohumeral arthritis but unacceptable construct validity
- C. acceptable reliability and validity for patients with shoulder instability, rotator cuff disease, and glenohumeral arthritis but unacceptable responsiveness
- D. acceptable reliability, validity, and responsiveness for patients with shoulder instability, rotator cuff disease, and glenohumeral arthritis**
- E. superior reliability, validity, and responsiveness for patients with shoulder instability, rotator cuff disease, and glenohumeral arthritis compared with other shoulder outcome instruments

Kocher MS, Horan MP, Briggs KK, Richardson TR, O'Holleran J, Hawkins RJ. Reliability, validity, and responsiveness of the American Shoulder and Elbow Surgeons subjective shoulder scale in patients with shoulder instability, rotator cuff disease, and glenohumeral arthritis. *J Bone Joint Surg Am.* 2005;87:2006.

40. The anticoagulant effect of the synthetic pentasaccharide fondaparinux occurs by which of the following mechanisms?

- A. direct thrombin inhibition
- B. direct factor-XA inhibition
- C. indirect thrombin inhibition**
- D. vitamin-K antagonist
- E. inhibition of cyclooxygenase activity

Lieberman JR, Hsu WK. Current concepts review. Prevention of venous thromboembolic disease after total hip and knee arthroplasty. *J Bone Joint Surg Am.* 2005;87:2097.

41. A group of surgeons is asked to classify a group of thoracolumbar fractures with the Denis system and the AO (Magerl) scheme to test the schemes' interobserver reliability. Three months later, they are given the same radiographs in a different order to test intraobserver repeatability. The expected results are:

- A. high interobserver reliability but low intraobserver repeatability
- B. high interobserver reliability and substantial intraobserver repeatability
- C. fair-to-moderate interobserver reliability and substantial intraobserver repeatability**
- D. low interobserver reliability and low intraobserver repeatability
- E. fair-to-moderate interobserver reliability and fair-to-moderate intraobserver repeatability

Wood KB, Khanna G, Vaccaro AR, Arnold PM, Harris MB, Mehbod A. Assessment of two thoracolumbar fracture classification systems as used by multiple surgeons. *J Bone Joint Surg Am.* 2005;87:1423.

42. Radiographic evidence of severe posterior**column bone loss can best be identified by which radiographic landmark?**

- A. teardrop lysis
- B. superior component migration
- C. ischial lysis**
- D. violation of the Kohler line
- E. violation of the iliopsopectineal line

Sporer SM, Paprosky WG, O'Rourke M. Managing bone loss in acetabular revision. *J Bone Joint Surg Am.* 2005;87:1620.

43. When the elbow is used to determine skeletal age during the pubertal growth spurt, which anatomical structure is characterized by distinctive semiannual morphological changes that allow a good approximation of skeletal age?

- A. lateral condyle
- B. trochlea
- C. epicondyle
- D. olecranon apophysis**
- E. proximal radial epiphysis

Diméglio A, Charles YP, Daures J-P, de Rosa V, Kaboré B. Accuracy of the Sauvegrain method in determining skeletal age during puberty. *J Bone Joint Surg Am.* 2005;87:1689.

44. Physician-based elbow-rating systems and arm-specific and general health status questionnaires are most strongly influenced by:

- A. age, range of motion, and time since last surgery
- B. range of motion, with other factors having a more limited influence
- C. pain, with other factors having a more limited influence**
- D. radiographic signs of arthrosis
- E. ulnar neuropathy

Doornberg JN, Ring D, Fabian LM, Malhotra L, Zurakowski D, Jupiter JB. Pain dominates measurements of elbow function and health status. *J Bone Joint Surg Am.* 2005;87:1725.

45. Which of the following is the least common type of peroneal tendon tear?

- A. rupture (grade-III tear) of the peroneus brevis tendon**
- B. longitudinal tear of the peroneus longus tendon
- C. attritional tear of the peroneus brevis tendon in middle-aged women
- D. split tear of the peroneus brevis tendon
- E. tear associated with an accessory peroneus quartus tendon

Grant TH, Kelikian AS, Jereb SE, McCarthy RJ. Ultrasound diagnosis of peroneal tendon tears. A surgical correlation. *J Bone Joint Surg Am.* 2005;87:1788.

46. Which of the following statements is true about the impact of patient characteristics (including age, gender, race, education level, poverty status, smoking, preinjury health, and self-efficacy) on functional outcomes of limb-threatening lower-extremity trauma as measured by the Sickness Impact Profile?

- A. only smoking and preinjury health status are

- significantly related to functional outcome
- B. older, college-educated women are likely to have the best outcomes
- C. all characteristics are important predictors of outcome, but none can be addressed in the recovery phase of the injury to help improve outcomes

D. all characteristics are important predictors of outcome following either amputation or reconstruction

- E. none of the above

MacKenzie EJ, Bosse MJ, Pollak AN, Webb LX, Swiontkowski MF, Kellam JF, Smith DG, Sanders RW, Jones AL, Starr AJ, McAndrew MP, Patterson BM, Burgess AR, Castillo RC. Long-term persistence of disability following severe lower-limb trauma. Results of a seven-year follow-up. *J Bone Joint Surg Am.* 2005;87:1801.

47. The etiology of fibrous dysplasia has been linked to:

- A. an autosomal dominant genetic trait
- B. a congenital anomaly

C. a mutation in a guanine-nucleotide binding protein

- D. a decreased amount of cAMP produced by dysplastic cells
- E. a mutation of TRNA for alanine

DiCaprio MR, Enneking WF. Current concepts review. Fibrous dysplasia. Pathophysiology, evaluation, and treatment. *J Bone Joint Surg Am.* 2005;87:1848.

48. Which of the following statements regarding the indications for rotator cuff surgery is true?

- A. the indications for rotator cuff surgery are standardized
- B. the natural history of rotator cuff disease is known
- C. there is consensus among orthopaedic surgeons regarding the treatment of rotator cuff tears

D. there is a lack of clinical agreement about the indications for rotator cuff surgery

- E. there is no regional variation among orthopaedic surgeons regarding clinical decision-making about rotator cuff disease

Dunn WR, Schackman BR, Walsh C, Lyman S, Jones EC, Warren RF, Marx RG. Variation in orthopaedic surgeons' perceptions about the indications for rotator cuff surgery. *J Bone Joint Surg Am.* 2005;87:1978.

49. In a prospective study that compared the results of vascularized fibular grafting with those of nonvascularized fibular grafting for the treatment of osteonecrotic lesions of the femoral head, the authors found that vascularized fibular grafting provided:

- A. better results for patients with steroid-associated osteonecrosis, regardless of stage
- B. better results for younger patients

C. better results for patients with a Stage-IIIC lesion

- D. better results for patients with a Stage-IIIC or Stage-IVC lesion

- E. no difference compared with nonvascularized fibular grafting

Kim S-Y, Kim Y-G, Kim P-T, Ihn J-C, Cho B-C, Koo K-H. Vascularized compared with nonvascularized fibular grafts for large osteonecrotic lesions of the femoral head. *J Bone Joint Surg Am.* 2005;87:2012.

50. In a cadaveric elbow model, valgus elbow laxity was found to be greatest in which of the following configurations?

- A. pronation
- B. supination**
- C. neutral rotation
- D. full flexion
- E. full extension

Safran MR, McGarry MH, Shin S, Han S, Lee TQ. Effects of elbow flexion and forearm rotation on valgus laxity of the elbow. *J Bone Joint Surg Am.* 2005;87:2065.

ANSWER KEY

The correct answers are blacked out.

1. A B **C** D E 18. A **B** C D E 35. A **B** C D E
 2. A B **C** D E 19. A B C D **E** 36. A **B** C D E
 3. A **B** C D E 20. A B **C** D E 37. A B C D **E**
 4. A B C **D** E 21. A B C **D** E 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** E
 10. A B C D **E** 27. A **B** C D E 44. A B **C** D E
 11. A **B** C D E 28. A **B** C D E 45. A **B** C D E
 12. A **B** C D E 29. A **B** C D E 46. A B C **D** E
 13. A B **C** D E 30. A **B** C D E 47. A B **C** D E
 14. A B C **D** E 31. A B C D **E** 48. A B C **D** E
 15. A B C **D** E 32. A B C D **E** 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 **E** 34. A **B** C D E

ACCREDITATION STATEMENT

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The deadline to submit your answers for grading this set of questions was January 15, 2006.

QUESTIONS?

For payment questions, contact the Subscription Department at 781-449-9780, x140. For questions regarding submitted tests, contact Melissa Viola at 781-449-9780, x124. E-mail all other questions to cme@jbjs.org.