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CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

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**1. In a simulated unstable intra-articular distal radial fracture model, augmentation of Kirschner wire fixation with calcium phosphate cement provides:**

- A. inferior stability compared with that provided by augmented external fixation, but increased stability compared with that provided by Kirschner wire fixation alone
- B. stability similar to that provided both by augmented external fixation and by Kirschner wire fixation
- C. increased stability compared with that provided by augmented external fixation, but decreased stability compared with that provided by Kirschner wire fixation alone
- D. stability similar to that provided by augmented external fixation, but increased stability compared with that provided by Kirschner wire fixation
- E. inferior stability compared with that provided by all tested methods of percutaneous fixation

**Higgins TF, Dodds SD, Wolfe SW.** A biomechanical analysis of fixation of intra-articular distal radial fractures with calcium-phosphate bone cement. *J Bone Joint Surg Am.* 2002;84:1579-86.

**2. The most common cause of failure of total knee arthroplasty in patients with hemophilic arthropathy is:**

- A. polyethylene wear
- B. infection
- C. loosening
- D. instability
- E. patellar fracture

**Norian JM, Ries MD, Karp S, Hambleton J.** Total knee arthroplasty in hemophilic arthropathy. *J Bone Joint Surg Am.* 2002;84:1138-41.

**3. A ruptured patellar tendon after a total knee arthroplasty is best treated by which of the following alternatives?**

- A. xenograft augmentation
- B. primary repair of the ruptured tendon
- C. arthrodesis
- D. primary repair with allograft reconstruction
- E. cast immobilization

**Crossett LS, Sinha RK, Sechriest VF, Rubash HE.** Reconstruction of a ruptured patellar tendon with Achilles tendon allograft following total knee arthroplasty. *J Bone Joint Surg Am.* 2002;84:1354-61.

**4. Compared with a two-strand semitendinosus-gracilis autograft, a bone-patellar tendon-bone autograft for reconstruction of the anterior cruciate ligament provides a superior outcome with regard to:**

- A. patient satisfaction
- B. anterior knee laxity
- C. activity level
- D. ability to run or squat
- E. stair climbing

**Beynon BD, Johnson RJ, Fleming BC, Kannus P, Kaplan M, Samani J, Renström P.** Anterior cruciate ligament replacement: comparison on bone-patellar tendon-bone grafts with two-strand hamstring grafts. A prospective, randomized

study. *J Bone Joint Surg Am.* 2002;84:1503-13.

**5. Which of the following statements best describes the outcome of high-energy tibial plateau fractures more than five years after the injury?**

- A. there is a high prevalence of severe arthrosis and secondary reconstructive procedures
- B. there is a significant deterioration in patient function, SF-36 score, and Iowa knee score
- C. there is no apparent deterioration in patient function, SF-36 score, or Iowa knee score
- D. older patients are more satisfied with the result than are younger patients
- E. men are more satisfied with the result than are women

**Wiegel DP, Marsh JL.** High-energy fractures of the tibial plateau. Knee function after longer follow-up. *J Bone Joint Surg Am.* 2002;84:1541-51.

**6. In total hip replacement surgery, the most important factor predicting the likelihood of autologous or allogeneic transfusion is:**

- A. the availability of predonated autologous units
- B. the severity of baseline anemia
- C. the amount of operative blood loss
- D. the amount of blood loss estimated for the entire hospital duration
- E. the body-mass index of the patient

**Billote DB, Glisson SN, Green D, Wixson RL.** A prospective, randomized study of preoperative autologous donation for hip replacement surgery. *J Bone Joint Surg Am.* 2002;84:1299-304.

**7. With regard to forefoot structural pathology in diabetic patients, which statement is most accurate?**

- A. age-related changes are dominant in comparison with diabetes-associated changes
- B. diabetes-associated changes affect only the soft tissues
- C. age-related changes are of the same magnitude as diabetes-associated changes
- D. diabetes-associated changes are dominant in comparison with age-related changes
- E. age-related changes partially correct for diabetes-associated changes

**Robertson DD, Mueller MJ, Smith KE, Commeyan PK, Pilgram T, Johnson JE.** Structural changes in the forefoot of individuals with diabetes and a prior plantar ulcer. *J Bone Joint Surg Am.* 2002;84:1395-404.

**8. What is the primary contraindication for meniscal transplantation?**

- A. axial malalignment
- B. advanced arthrosis
- C. elderly patient
- D. focal chondral lesions
- E. obesity

**Cole BJ, Carter TR, Rodeo SA.** Instructional Course Lecture, American Academy of Orthopaedic Surgeons. Allograft meniscal transplantation. Background, techniques, and results. *J Bone Joint Surg Am.* 2002;84:1236-50.

**9. Which of the following regarding meta-analysis is most correct?**

- A. meta-analysis is a thorough review of the literature without pooling of results across included studies
- B. meta-analysis is similar to a narrative review of the literature
- C. the quality of a meta-analysis is not affected by the quality of the individual studies that are included**
- D. meta-analysis is a systematic review of the literature that utilizes qualitative methods
- Bhandari M, Guyatt GH, Montori V, Devereaux PJ, Swiontkowski MF.** Current concepts review. User's guide to the orthopaedic literature: how to use a systematic literature review. *J Bone Joint Surg Am.* 2002;84:1672-82.
- 10. Which of the following is associated with the greatest risk of a refracture following an index osteoporotic fracture?**
- A. female gender
- B. poor walking ability
- C. dementia
- D. age over eighty-five years at the time of the index fracture
- E. age between forty-five and forty-nine years at the time of the index fracture**
- Robinson CM, Royds M, Abraham A, McQueen MM, Court-Brown CM, Christie J.** Refracture in patients at least forty-five years old. A prospective analysis of twenty-two thousand and sixty patients. *J Bone Joint Surg Am.* 2002;84:1528-33.
- 11. Medial elbow ganglion as a cause of cubital tunnel syndrome is most likely to be associated with which of the following conditions?**
- A. osteoarthritis of the elbow**
- B. rheumatoid arthritis of the elbow
- C. elbow instability
- D. tennis elbow
- E. malunion of a distal humeral fracture
- Kato H, Hirayama T, Minami A, Iwasaki N, Hirachi K.** Cubital tunnel syndrome associated with medial elbow ganglia and osteoarthritis of the elbow. *J Bone Joint Surg Am.* 2002;84:1413-9.
- 12. Good pain relief following total knee arthroplasty for osteoarthritis in limbs affected by poliomyelitis is most reliably obtained:**
- A. if the patient has had no prior surgery on the knee
- B. if the patient does not have preoperative recurvatum of the knee
- C. if one uses a highly constrained condylar knee design
- D. if the patient lives independently
- E. if the patient has antigravity quadriceps strength or greater quadriceps strength**
- Giori NJ, Lewallen DG.** Total knee arthroplasty in limbs affected by poliomyelitis. *J Bone Joint Surg Am.* 2002;84:1157-61.
- 13. Delamination is a damage mode that has been observed on the articulating surfaces of retrieved polyethylene components used in total knee arthroplasty. Which of the following statements is true regarding delamination after total knee arthroplasty?**
- A. delamination may result from subsurface fatigue failure**
- B. the prevalence of delamination is independent of the time of implantation
- C. delamination is the most common type of damage observed on retrieved tibial polyethylene components used in total knee arthroplasty
- D. delamination occurs earlier in net-shaped compression-molded polyethylene total knee arthroplasty components than in machined ram-extruded components
- E. delamination is less prevalent in highly oxidized polyethylene components
- Berzins A, Jacobs JJ, Berger R, Ed C, Natarajan R, Andriacchi T, Galante J.** Surface damage in machined ram-extruded and net-shape molded retrieved polyethylene tibial inserts of total knee replacements. *J Bone Joint Surg Am.* 2002;84:1534-40.
- 14. Which of the following factors is NOT associated with an increased risk of a contralateral slipped capital femoral epiphysis?**
- A. African-American ethnicity
- B. advanced bone age**
- C. endocrinopathy
- D. premenarchal status
- E. obesity
- Schultz WR, Weinstein JN, Weinstein SL, Smith BG.** Prophylactic pinning of the contralateral hip in slipped capital femoral epiphysis. Evaluation of long-term outcome for the contralateral hip with use of decision analysis. *J Bone Joint Surg Am.* 2002;84:1305-14.
- 15. Wear on the backside of modular tibial polyethylene of a cemented total knee prosthesis may be accelerated by tibial post-cam impingement. Risk of post-cam impingement can be decreased by avoiding all of the following EXCEPT:**
- A. flexion of the femoral component
- B. posterior placement of the pilot hole for the femoral intramedullary alignment guide
- C. posterior slope of the tibial component
- D. tight extension gap**
- E. clinical hyperextension
- O'Rourke MR, Callaghan JJ, Goetz DD, Sullivan PM, Johnston RC.** Osteolysis associated with a cemented modular posterior-cruciate-substituting total knee design. Five to eight-year follow-up. *J Bone Joint Surg Am.* 2002;84:1362-71.
- 16. The most frequent location for incomplete seating of the glenoid component after total shoulder replacement for osteoarthritis is:**
- A. anterior
- B. posterior**
- C. superior
- D. inferior
- E. central
- Lazarus MD, Jensen KL, Southworth C, Matsen FA 3rd.** The radiographic evaluation of keeled and pegged glenoid component insertion. *J Bone Joint Surg Am.* 2002;84:1174-82.
- 17. Patient dissatisfaction following a hammer-**

**toe repair is most commonly associated with:**

- A. vascular impairment
- B. toenail abnormality
- C. numbness with injury of the digital nerve**
- D. swelling of the digit

**Coughlin MJ.** Instructional Course Lectures, American Academy of Orthopaedic Surgeons. Lesser-toe abnormalities. *J Bone Joint Surg Am.* 2002;84:1446-69.

**18. In addition to surgically treating a patient with a low-energy hip fracture, the orthopaedist should:**

- A. obtain a dual-energy x-ray absorptiometry scan prior to discharge
- B. begin treatment with calcium, a bisphosphonate, and estrogen
- C. begin treatment with vitamin D, calcium, and a bisphosphonate**
- D. prescribe a commercial hip protector
- E. consult an endocrinologist or metabolic bone specialist

**Gardner MJ, Flik KB, Mooar P, Lane JM.** Improvement in the undertreatment of osteoporosis following hip fracture. *J Bone Joint Surg Am.* 2002;84:1342-8.

**19. Cementation of a polyethylene liner into a well-fixed metal shell has become an increasingly popular technique in revision total hip arthroplasty. Which of the following factors would most likely lead to catastrophic failure of this construct?**

- A. an undersized liner with a smooth surface
- B. an undersized liner with a circumferentially grooved surface
- C. an undersized liner placed into a metal shell with no holes
- D. an oversized liner**
- E. an undersized liner placed into a cluster-holed metal shell

**Bonner KF, Delanois RE, Harbach G, Bushelow M, Mont MA.** Cementation of a polyethylene liner into a metal shell. Factors related to mechanical stability. *J Bone Joint Surg Am.* 2002;84:1587-93.

**20. A six-year-old girl with a history of developmental dysplasia of the hip that was treated in infancy is seen during routine follow-up. She has no pain or limp but has radiographic evidence of residual acetabular dysplasia. The recommended treatment is:**

- A. observation; tell the parents that the child will do well
- B. abduction bracing
- C. no treatment now; tell the parents that a pelvic osteotomy may be needed as a teenager
- D. femoral osteotomy only
- E. pelvic osteotomy with or without femoral osteotomy**

**Lalonde FD, Frick SL, Wenger DR.** Surgical correction of residual hip dysplasia in two pediatric age-groups. *J Bone Joint Surg Am.* 2002;84:1148-56.

**21. Which of the following statements is true regarding the final results of single-portal**

**endoscopic carpal tunnel release compared with those of open release?**

- A. open release allows faster return of grip strength
- B. endoscopic release is followed by decreased sensation
- C. endoscopic release allows earlier return to work**
- D. endoscopic release results in delayed return of dexterity
- E. endoscopic release is more expensive

**Trumble TE, Diao E, Abrams RA, Gilbert-Anderson MM.** Single-portal endoscopic carpal tunnel release compared with open release. A prospective, randomized trial. *J Bone Joint Surg Am.* 2002;84:1107-15.

**22. Which of the following statements is FALSE regarding femoral nailing on a fracture table versus femoral nailing on a radiolucent table with manual traction?**

- A. malrotation occurs more frequently with use of a fracture table
- B. total operating time is shorter with use of manual traction
- C. there is no significant difference in fluoroscopy time
- D. insertion of a nail locking screw is faster with manual traction
- E. in patients with simple fracture patterns (AO types A and B), limb length is more likely to be restored correctly on a fracture table**

**Stephen DJG, Kreder HJ, Schemitsch EH, Conlan LB, Wild L, McKee MD.** Femoral intramedullary nailing: comparison of fracture-table and manual traction. A prospective, randomized study. *J Bone Joint Surg Am.* 2002;84:1514-21.

**23. The functional improvement after total shoulder arthroplasty for osteoarthritis can best be characterized by which of the following statements?**

- A. younger patients demonstrate more improvement than older patients do
- B. patients regain about two-thirds of the function absent preoperatively**
- C. patients with greater preoperative function improve more than those with less preoperative function do
- D. men demonstrate less improvement than women do
- E. postoperative function is independent of preoperative function

**Fehringer EV, Kopjar B, Boorman RS, Churchill RS, Smith KL, Matsen FA 3rd.** Characterizing the functional improvement after total shoulder arthroplasty for osteoarthritis. *J Bone Joint Surg Am.* 2002;84:1349-53.

**24. Which of the following is NOT associated with a high risk of redislocation of the shoulder following an acute first-time dislocation?**

- A. isolated fracture of the greater tuberosity**
- B. massive rotator cuff tear
- C. fracture of the glenoid rim
- D. original dislocation produced by a

- high-energy injury
- E. associated neurological deficit  
**Robinson CM, Kelly M, Wakefield AE.** Redislocation of the shoulder during the first six weeks after a primary anterior dislocation: risk factors and results of treatment. *J Bone Joint Surg Am.* 2002;84:1552-9.
- 25. Ischemic necrosis of the immature femoral head has been shown to produce femoral head flattening. Which of the following processes plays a role in the development of femoral head flattening?**
- A. appositional bone formation  
**B. osteoclastic bone resorption**  
 C. mechanical fragmentation  
 D. subchondral bone fracture  
 E. chondrolysis  
**Kim HKW, Su P-H.** Development of flattening and apparent fragmentation following ischemic necrosis of the capital femoral epiphysis in a piglet model. *J Bone Joint Surg Am.* 2002;84:1329-34.
- 26. Enlargement of the toes and forefoot are common problems associated with macrodactyly of the foot. Which of the following procedures will most likely reduce the size of the foot to allow fitting of regular shoes?**
- A. toe amputation  
 B. toe shortening  
 C. epiphysiodesis  
**D. ray resection of lesser toes**  
 E. debulking  
**Chang CH, Kumar SJ, Riddle EC, Glutting J.** Macrodactyly of the foot. *J Bone Joint Surg Am.* 2002;84:1189-94.
- 27. Postoperative rehabilitation protocols following repair of intra-synovial flexor tendon lacerations emphasize:**
- A. high-force rehabilitation protocol to stimulate formation of type-I collagen at the repair site  
 B. high-force rehabilitation protocol to stimulate maturity of repair site extracellular matrix  
**C. low-force rehabilitation protocol as that has been shown to result in tendon repair-site structure and function equal to those achievable by high-force protocols without the additional risk of rupture or gap formation**  
 D. immobilization for three to six weeks to maximize tendon healing  
 E. early mobilization following manipulation under anesthesia  
**Boyer MI, Strickland JW, Engles DR, Sachar K, Leversedge FJ.** Instructional Course Lectures, American Academy of Orthopaedic Surgeons. Flexor tendon repair and rehabilitation. State of the art in 2002. *J Bone Joint Surg Am.* 2002;84:1683-706.
- 28. The fifteen-year survivorship free of revision for aseptic loosening of a collared matte-finished femoral component inserted with second-generation cement techniques is:**
- A. the same for patients regardless of age  
**B. worse for patients under fifty years of age at the time of the operation**  
 C. better for patients under fifty years of age at the time of the operation  
 D. worse for patients of high weight  
 E. worse in males than in females  
**Sanchez-Sotelo J, Berry DJ, Harmsen S.** Long-term results of use of a collared matte-finished femoral component fixed with second-generation cementing technique. A fifteen-year-median follow-up study. *J Bone Joint Surg Am.* 2002;84:1636-41.
- 29. Which of the following factors has been shown to increase the risk of pulmonary fat embolism following total hip arthroplasty?**
- A. bilateral simultaneous total hip arthroplasty  
 B. operative time of less than two hours  
 C. total hip arthroplasty with cement  
 D. regional rather than general anesthesia  
**E. preoperative elevated triglyceride level**  
**Kim Y-H, Oh S-W, Kim J-S.** Prevalence of fat embolism following bilateral simultaneous and unilateral total hip arthroplasty performed with or without cement. A prospective, randomized clinical study. *J Bone Joint Surg Am.* 2002;84:1372-9.
- 30. Patellar impingement is one of the complications of unicompartmental arthroplasty. Which of the following factors has been shown to increase the risk of this complication?**
- A. preoperative degenerative changes in the patellofemoral joint  
**B. position of the femoral component**  
 C. preoperative congruity of the patellofemoral joint  
 D. shape of the patella  
 E. height of the patella  
**Hernigou P, Deschamps P.** Patellar impingement following unicompartmental arthroplasty. *J Bone Joint Surg Am.* 2002;84:1132-7.
- 31. Regarding viscosupplementation, the accuracy of needle placement into the intra-articular space of the knee is improved by using which of the following?**
- A. an anterolateral portal  
**B. a lateral midpatellar portal**  
 C. an anteromedial portal  
 D. a larger needle  
 E. preinjection of air or saline solution  
**Jackson DW, Evans NA, Thomas BM.** Accuracy of needle placement into the intra-articular space of the knee. *J Bone Joint Surg Am.* 2002;84:1522-7.
- 32. Ice has been demonstrated to reduce edema. Which of the following mechanisms is most likely responsible?**
- A. decreased microvascular perfusion secondary to venular vasoconstriction  
**B. decreased microvascular permeability**  
 C. decreased microvascular perfusion secondary to arteriolar vasoconstriction  
 D. decreased metabolic demands of the tissue following ice application  
 E. increased blood viscosity following ice application  
**Deal DN, Tipton J, Rosencrance E, Curl WW, Smith TL.** Ice reduces edema. A study of microvascular permeability in rats. *J Bone Joint Surg Am.* 2002;84:1573-8.

**33. Although bone and cartilage transplantation has been routinely performed for more than thirty-five years, there is no consensus regarding the ideal graft pretreatment. According to an experimental study in mice, both angiogenesis and immune tolerance can be improved in fast-frozen grafts (-70°C/min) in the following situation:**

A. in recipients of isografts pretreated by dimethylsulfoxide (a cryoprotective substance)

**B. in non-presentsitized recipients of allografts pretreated by dimethylsulfoxide**

C. in non-presentsitized recipients of allografts without pretreatment

D. in presentsitized recipients of allografts pretreated by dimethylsulfoxide

E. in presentsitized recipients of allografts without pretreatment

**Wingenfeld C, Egli RJ, Hempfing A, Ganz R, Leunig M.** Cryopreservation of osteochondral allografts: dimethyl sulfoxide promotes angiogenesis and immune tolerance in mice. *J Bone Joint Surg Am.* 2002;84:1420-9.

**34. On examination of the foot, the most reliable indicator of instability of the lesser metatarsophalangeal joints is:**

**A. pain with dorsal/plantar drawer test**

B. fixed contracture of the involved digit

C. neuritic symptoms

D. associated intractable plantar keratosis

E. concomitant hammertoe deformity

**Coughlin MJ.** Instructional Course Lectures, American Academy of Orthopaedic Surgeons. Lesser-toe abnormalities. *J Bone Joint Surg Am.* 2002;84:1446-69.

**35. Which of the following variables has the strongest association with patient satisfaction following reconstruction of the anterior cruciate ligament?**

A. patient age

B. source of the graft used to reconstruct the anterior cruciate ligament

C. difference between sides demonstrated by KT-1000 testing with maximum manual pressure

D. thigh girth

**E. patient's subjective assessment of symptoms and function**

**Kocher MS, Steadman JR, Briggs K, Zurakowski D, Sterett WI, Hawkins RJ.** Determinants of patient satisfaction with outcome after anterior cruciate ligament reconstruction. *J Bone Joint Surg Am.* 2002;84:1560-72.

**36. A ten-year follow-up study of cementless porous-coated sockets implanted without screw fixation revealed that the most likely cause for revision of the socket was:**

A. change of cup position

B. recurrent dislocation

C. aseptic loosening of the socket

**D. polyethylene wear**

E. liner dissociation

**Udomkiat P, Dorr LD, Wan Z.** Cementless hemispheric porous-coated sockets implanted with press-fit technique with

out screws: average ten-year follow-up. *J Bone Joint Surg Am.* 2002;84:1195-1200.

**37. Comorbidities can adversely affect the results of self-assessment instruments used by patients with musculoskeletal disease. In a study of patients with adhesive capsulitis, which condition was associated with the highest number of comorbidities?**

A. low-back pain

B. hypertension

**C. diabetes**

D. depression

E. Workers' Compensation claim

**Moriatis Wolf J, Green A.** Influence of comorbidity on self-assessment instrument scores of patients with idiopathic adhesive capsulitis. *J Bone Joint Surg Am.* 2002;84:1167-73.

**38. What is the most common early complication after hip revision with impacted morselized allograft bone and cement?**

A. femoral head dislocation

B. aseptic loosening

C. infection

**D. femoral fracture**

E. pulmonary embolism

**Ornstein W, Atroshi I, Franzén H, Johnsson R, Sandquist P, Sundberg M.** Early complications after one hundred and forty-four consecutive hip revisions with impacted morselized allograft bone and cement. *J Bone Joint Surg Am.* 2002;84:1323-8.

**39. Accurate sizing of a meniscal allograft is critical for a successful outcome. Following correction for magnification, what percentage of the sagittal length of the tibial plateau is the medial meniscal length?**

A. 120%

B. 100%

C. 90%

**D. 80%**

E. 70%

**Cole BJ, Carter TR, Rodeo SA.** Instructional Course Lecture, American Academy of Orthopaedic Surgeons. Allograft meniscal transplantation. Background, techniques, and results. *J Bone Joint Surg Am.* 2002;84:1236-50.

**40. Which of the following is the most important factor influencing the longevity of the acetabular component following the conversion of a fused hip to a total hip arthroplasty?**

A. diagnosis at the time of fusion

B. gender of the patient

**C. age at which the fusion was performed**

D. age at which the total hip arthroplasty was performed

E. type/nature of the fusion technique

**Joshi AB, Markovic L, Hardinge K, Murphy JCM.** Conversion of a fused hip to total hip arthroplasty. *J Bone Joint Surg Am.* 2002;84:1335-41.

**41. The correct initial treatment of a severe rattlesnake envenomation in a child is:**

A. intramuscular antivenin

**B. intravenous antivenin**

- C. fasciotomy and débridement of necrotic tissue
- D. antivenin only for confirmed compartment syndrome
- E. antivenin and fasciotomy

**Shaw BA, Hosalkar HS.** Rattlesnake bites in children: antivenin treatment and surgical indications. *J Bone Joint Surg Am.* 2002;84:1624-9.

**42. Which of the following parameters is the most useful early predictor of scoliosis in patients with myelomeningocele?**

- A. age of onset
- B. ambulatory status
- C. clinical motor level
- D. last intact laminar arch**
- E. asymmetrical motor involvement

**Trivedi J, Thomson JD, Slakey JB, Banta JV, Jones PW.** Clinical and radiographic predictors of scoliosis in patients with myelomeningocele. *J Bone Joint Surg Am.* 2002;84:1389-94.

**43. Postinjection granulomatous inflammation of the knee following intra-articular hylan viscosupplementation is best characterized by:**

- A. immediate postinjection pain, swelling, and erythema that is self-limited and resolves within two days after the injection
- B. mild swelling and warmth that develops within two days after the injection, peaks at five days, and generally resolves by two weeks but with persistent pain**
- C. mild swelling and warmth that develops within two days after the injection and is accompanied by fever and constitutional symptoms
- D. intense pain, swelling, warmth, and erythema that are clinically indistinguishable from the symptoms of septic arthritis
- E. moderate swelling and warmth that develop several weeks after the injection and result in chronic, debilitating pain

**Chen AL, Desai P, Adler EM, Di Cesare PE.** Granulomatous inflammation after hylan G-F 20 viscosupplementation of the knee. A report of six cases. *J Bone Joint Surg Am.* 2002;84:1142-7.

**44. In a study of patients younger than sixty who had sustained a displaced subcapital fracture of the hip, the results of reduction and internal fixation performed within the first twelve hours after injury were compared with those of operations done more than twelve hours after injury. It was found that patients who were operated on more than twelve hours after injury had:**

- A. a poorer functional outcome
- B. a higher prevalence of osteonecrosis**
- C. a higher prevalence of delayed union
- D. a higher prevalence of deep venous thrombosis
- E. a higher prevalence of urinary tract infection

**Jain R, Koo M, Kreder HJ, Schemitsch EH, Davey JR, Mahomed NN.** Comparison of early and delayed fixation of subcap-

ital hip fractures in patients sixty years of age or less. *J Bone Joint Surg Am.* 2002;84:1605-12.

**45. According to current recommendations concerning the placement of core sutures in the repair of intrasynovial flexor tendon lacerations:**

- A. the two-strand core suture technique is optimal because of the decreased bulk at the repair site
- B. the four, six, or eight-strand core suture technique is optimal because of the improved biomechanical performance of the repair site up to six weeks postoperatively demonstrable in both ex vivo and in vivo studies**
- C. the number of suture strands crossing the repair site has no direct effect on repair site strength
- D. multiple-strand core suture techniques employing "locking" loops result in significantly higher load-to-failure strength than those employing "grasping" loops do
- E. multiple-strand core suture techniques can be employed with little risk to the viability of the tendon stumps and epitenon

**Boyer MI, Strickland JW, Engles DR, Sachar K, Leversedge FJ.** Instructional Course Lectures, American Academy of Orthopaedic Surgeons. Flexor tendon repair and rehabilitation. State of the art in 2002. *J Bone Joint Surg Am.* 2002;84:1683-706.

**46. Which of the following are necessary for a good result of the treatment of a chronic unreduced simple dislocation of the elbow?**

- A. collateral ligament repair with tendon grafts
- B. release or transfer of the biceps
- C. coronoid bone block
- D. limited damage to the articular surfaces**
- E. good preoperative range of motion

**Jupiter JB, Ring D.** Treatment of unreduced elbow dislocations with hinged external fixation. *J Bone Joint Surg Am.* 2002;84:1630-5.

**47. Reduction of a chronic radial head dislocation is not an easy procedure. In order to achieve good results, which of the following factors is THE LEAST important?**

- A. osteotomy of the ulna
- B. elongation of the ulna
- C. rigid fixation of the ulna
- D. reconstruction of the annular ligament**
- E. application of a cast with neutral forearm rotation

**Horii E, Nakamura R, Koh S, Inagaki H, Yajima H, Nakao E.** Surgical treatment for chronic radial head dislocation. *J Bone Joint Surg Am.* 2002;84:1183-8.

**48. Of the following factors, which is associated with the highest risk of later fracture of the femoral shaft (excluding intraoperative fractures) following surgery for a hip fracture?**

- A. low mental test score of the patient at the

- time of the original hip fracture
- B. male gender of the patient
- C. a hip fracture pattern graded as severe with use of the Garden and Evans classification
- D. poor walking ability of the patient prior to the hip fracture

**E. use of an implant with a proximal diaphyseal intramedullary stress riser**

**Robinson CM, Adams CI, Craig M, Doward W, Clarke MCC, Auld J.** Implant-related fractures of the femur following hip fracture surgery. *J Bone Joint Surg Am.* 2002;84:1116-22.

**49. Compared with the frequency of an acute local reaction in patients who have only one course of treatment with hylan GF-20 (Synvisc), the frequency in patients who have more than one course of treatment:**

- A. decreases approximately eightfold in patients treated previously
- B. decreases 50% in patients treated previously
- C. is the same
- D. doubles in patients treated previously

**E. increases approximately eightfold in patients treated previously**

**Leopold SS, Warme WJ, Pettis PD, Shott S.** Increased frequency of acute local reaction to intra-articular hylan GF-20 (Synvisc) in patients receiving more than one course of treatment. *J Bone Joint Surg Am.* 2002;84:1619-23.

**50. Pin loosening is a frequent complication of external fixation. Which of the following measures decreases the risk of pin loosening most?**

- A. use of pins with a smaller diameter
- B. pin-care regimen utilizing topical antibiotics
- C. use of hydroxyapatite-coated pins**
- D. use of pure titanium pins
- E. increasing the rigidity of the construct

**Pommer A, Muhr G, Dávid A.** Hydroxyapatite-coated Schanz pins in external fixators used for distraction osteogenesis. A randomized, controlled trial. *J Bone Joint Surg Am.* 2002; 84:1162-6.

**ANSWER KEY**

The correct answers are blacked out.

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| 1. <b>A</b> B C D E  | 18. A B <b>C</b> D E | 35. A B C D <b>E</b> |
| 2. A <b>B</b> C D E  | 19. A B C <b>D</b> E | 36. A B C <b>D</b> E |
| 3. A B C <b>D</b> E  | 20. A B C D <b>E</b> | 37. A B <b>C</b> D E |
| 4. A <b>B</b> C D E  | 21. A B <b>C</b> D E | 38. A B C <b>D</b> E |
| 5. A B <b>C</b> D E  | 22. A B C D <b>E</b> | 39. A B C <b>D</b> E |
| 6. A <b>B</b> C D E  | 23. A <b>B</b> C D E | 40. A B <b>C</b> D E |
| 7. A B C <b>D</b> E  | 24. <b>A</b> B C D E | 41. A <b>B</b> C D E |
| 8. A <b>B</b> C D E  | 25. A <b>B</b> C D E | 42. A B C <b>D</b> E |
| 9. A B <b>C</b> D E  | 26. A B C <b>D</b> E | 43. A <b>B</b> C D E |
| 10. A B C D <b>E</b> | 27. A B <b>C</b> D E | 44. A <b>B</b> C D E |
| 11. <b>A</b> B C D E | 28. A <b>B</b> C D E | 45. A <b>B</b> C D E |
| 12. A B C D <b>E</b> | 29. A B C D <b>E</b> | 46. A B C <b>D</b> E |
| 13. <b>A</b> B C D E | 30. A <b>B</b> C D E | 47. A B C <b>D</b> E |
| 14. A <b>B</b> C D E | 31. A <b>B</b> C D E | 48. A B C <b>D</b> E |
| 15. A B C <b>D</b> E | 32. A <b>B</b> C D E | 49. A B C <b>D</b> E |
| 16. A <b>B</b> C D E | 33. A <b>B</b> C D E | 50. A B <b>C</b> D E |
| 17. A B <b>C</b> D E | 34. <b>A</b> B C D E |                      |

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**QUESTIONS?**

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