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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 IS OCTOBER 15, 2004.

- 1. A forty-four-year-old male laborer has severe right leg and foot pain of two months' duration despite being off from work, four weeks of physical therapy, and oral nonsteroidal anti-inflammatory drug therapy. Examination reveals grade-4 (of 5) strength of the great toe and ankle dorsiflexors and mildly decreased sensation in an L5 distribution. Magnetic resonance imaging shows a disc herniation displacing the right L5 nerve root. Treatment options including epidural steroid injection and discectomy are discussed. Which of the following is true?**
- A. it is too late for an epidural steroid injection to decrease the pain
 B. delaying discectomy for a trial of epidural steroid injection will probably result in a less optimal clinical result
 C. since the oral nonsteroidal anti-inflammatory drug (ibuprofen) did not help, it is unlikely that the epidural steroid injection would decrease the pain
D. a trial of epidural steroid injection is unlikely to adversely affect the clinical outcome by delaying the time to the surgery
 E. a disc herniation that has a low signal intensity on T2-weighted magnetic resonance images will probably resorb spontaneously
- Buttermann GR.** Treatment of lumbar disc herniation: epidural steroid injection compared with discectomy. A prospective, randomized study. *J Bone Joint Surg Am.* 2004;86:670.
- 2. Which of the following statements is true regarding the accuracy of ultrasonography and magnetic resonance imaging for diagnosing and measuring the size of full and partial-thickness tears of the rotator cuff?**
- A. magnetic resonance imaging is more accurate than ultrasonography for diagnosing and measuring partial-thickness tears, but the two have comparable accuracy for full-thickness rotator cuff tears
B. ultrasonography and magnetic resonance imaging have comparable accuracy for diagnosing and measuring full and partial-thickness rotator cuff tears
 C. ultrasonography is more accurate than magnetic resonance imaging for diagnosing but not for measuring full and partial-thickness rotator cuff tears
 D. ultrasonography and magnetic resonance imaging have comparable accuracy for diagnosing full and partial-thickness rotator cuff tears, but magnetic resonance imaging is more accurate for measuring tear size
 E. magnetic resonance imaging is more accurate than ultrasonography for diagnosing and measuring full and partial-thickness rotator cuff tears
- Teefey SA, Rubin DA, Middleton WD, Hildebolt CF, Leibold RA, Yamaguchi K.** Detection and quantification of rotator cuff tears. Comparison of ultrasonographic magnetic resonance imaging and arthroscopic findings in seventy-one consecutive cases. *J Bone Joint Surg Am.* 2004;86:708.
- 3. In infants with brachial plexus injury, the imaging study of choice to detect posterior dislocation of the shoulder was found to be:**
- A. magnetic resonance imaging
B. ultrasonography from the posterior approach
 C. computerized tomography
 D. arthrography
 E. plain radiography
- Moukoko D, Ezaki M, Wilkes D, Carter P.** Posterior shoulder dislocation in infants with neonatal brachial plexus palsy. *J Bone Joint Surg Am.* 2004;86:787.
- 4. Which of the following statements regarding knee arthrodesis is false?**
- A. a knee fused in 10° to 15° of flexion allows a better sitting position and improves gait
B. a knee fused in 0° of extension results in a gait that requires a 10% increase in energy expenditure when compared with that of normal walking
 C. a knee fused in 15° of flexion leads to approximately 2 cm of ipsilateral limb shortening
 D. gait efficiency increases with the knee fused in 15° of flexion because of the change in push-off direction of the gastrocnemius muscle
 E. volunteers with an artificially fused knee walked faster with the knee fixed in 20° of flexion
- Conway JD, Mont MA, Bezwada HP.** Current concepts review. Arthrodesis of the knee. *J Bone Joint Surg Am.* 2004;86:835.
- 5. Which of the following statements describing aerosols is correct?**
- A. aerosols are fine particles with a diameter of 10 to 20 µm
 B. infected aerosols travel only a short distance from the generating source
C. infected aerosols can cause airborne infection if a susceptible host inhales them
 D. it is unlikely that contact transmission of infected aerosols to mucous membranes or a small wound will result in infection
 E. scrupulous hand-washing is sufficient to prevent transmission of airborne infection by aerosols
- Wong KC, Leung KS.** Current concepts review. Transmission and prevention of occupational infections in orthopaedic surgeons. *J Bone Joint Surg Am.* 2004;86:1065.
- 6. Among patients surveyed who had sustained orthopaedic trauma, the prevalence of post-traumatic stress disorder was found to be:**
- A. 5%
 B. 10%
 C. 25%
D. 50%
 E. 75%
- Starr AJ, Smith WR, Frawley WH, Borer DS, Morgan SJ, Reinert CM, Mendoza-Welch M.** Symptoms of posttraumatic stress disorder after orthopaedic trauma. *J Bone Joint Surg Am.* 2004;86:1115.
- 7. A meta-analysis of randomized trials evaluating the use of closed suction drains following elective hip and knee arthroplasty indicated that, in comparison with patients in whom no drains were used, patients in whom drains were used had a significant difference with regard to which of the following outcomes?**
- A. increased need for blood transfusion**
 B. reduced occurrence of wound hematoma
 C. increased reoperation rate for wound-healing complications
 D. reduced occurrence of wound infection
 E. reduced prevalence of venous thrombosis
- Parker MJ, Roberts CP, Hay D.** Closed suction drainage for

- hip and knee arthroplasty. A meta-analysis. *J Bone Joint Surg Am.* 2004;86:1146.
- 8. A patient with cervical spondylotic myelopathy and ossification of the posterior longitudinal ligament is undergoing C3-C6 corpectomy with strut graft under somatosensory and transcranial electric motor evoked potential monitoring guidance. During graft placement, the motor evoked potential amplitudes on the left side decrease by 50% and those on the right side decrease by 35%, with no change in the somatosensory evoked potentials. As the operating surgeon, how would you best react to these findings?**
- consider the changes to be within normal variability and continue operating without intervention
 - remove the strut graft immediately
 - raise the patient's mean arterial blood pressure to ≥ 90 mm Hg and continue operating
 - raise the patient's mean arterial blood pressure to ≥ 90 mm Hg, pause surgical manipulations, and wait to see if the motor evoked potentials improve before proceeding or intervening further**
 - maintain the patient's mean arterial blood pressure without any change, pause surgical manipulations, and wait to see if the motor evoked potentials improve before proceeding or intervening further
- Hilibrand AS, Schwartz DM, Sethuraman V, Vaccaro AR, Albert TJ.** Comparison of transcranial electric motor and somatosensory evoked potential monitoring during cervical spine surgery. *J Bone Joint Surg Am.* 2004;86:1248.
- 9. Sensitization to pain, if improperly treated, can result in:**
- improved patient outcomes and decreased pain
 - a hypersensitive pain response that persists even after the injury has resolved**
 - improved two-point discrimination
 - changes only in the peripheral nervous system
 - changes only in the central nervous system
- Ekman EF, Koman LA.** Instructional course lecture. Acute pain following musculoskeletal injuries and orthopaedic surgery. Mechanisms and management. *J Bone Joint Surg Am.* 2004;86:1315.
- 10. In a study examining outcomes of unicondylar knee arthroplasty at six to thirteen years postoperatively, which factors were significantly associated with failure of the arthroplasty?**
- initial polyethylene thickness and patient weight
 - initial polyethylene thickness, polyethylene shelf age, and patient gender
 - polyethylene shelf age and patient age**
 - patient age and gender
 - absent anterior cruciate ligament at the surgery
- Collier MB, Engh CA Jr, Engh GA.** Shelf age of the polyethylene tibial component and outcome of unicondylar knee arthroplasty. *J Bone Joint Surg Am.* 2004;86:763.
- 11. Which combination of tests most accurately predicts damage to the acromioclavicular joint?**
- magnetic resonance imaging and examination for local tenderness
 - bone scan and the Paxinos (acromioclavicular compression) test**
 - O'Brien sign and radiographs
 - radiographs and bone scan
- radiographs and magnetic resonance imaging
- Walton J, Mahajan S, Paxinos A, Marshall J, Bryant C, Shnier R, Quinn R, Murrell GAC.** Diagnostic values of tests for acromioclavicular joint pain. *J Bone Joint Surg Am.* 2004;86:807.
- 12. A three-year-old boy presents to the emergency room with a twelve-hour history of worsening hip pain and fever and is unwilling to bear weight. The erythrocyte sedimentation rate is 42 mm/hr, and the white blood-cell count is $13 \times 10^9/L$. The most appropriate next step is to:**
- begin antibiotic therapy immediately
 - admit the patient for close follow-up
 - perform a bone scan immediately
 - perform a needle aspiration of the hip**
 - perform a surgical débridement of the hip immediately
- McCarthy JJ, Dormans JP, Kozin SH, Pizzutillo PD.** Instructional course lecture. Musculoskeletal infections in children. Basic treatment principles and recent advancements. *J Bone Joint Surg Am.* 2004;86:850.
- 13. Which of the following is the most crucial in determining the diagnosis of septic arthritis in children and the need for surgical irrigation and débridement?**
- history of fever
 - non-weight-bearing on the painful hip
 - erythrocyte sedimentation rate of ≥ 40 mm/hr
 - hip arthrocentesis analysis (white blood-cell count, Gram stain)**
 - serum white blood-cell count of $>12.0 \times 10^9/L$
- Luhmann SJ, Jones A, Schootman M, Gordon JE, Schoenecker PL, Luhmann JD.** Differentiation between septic arthritis and transient synovitis of the hip in children with clinical prediction algorithms. *J Bone Joint Surg Am.* 2004;86:956.
- 14. Arterial embolization of bone tumors can minimize intraoperative bleeding. Which of the following tumors does not require preoperative embolization?**
- metastatic renal cell carcinoma to the femoral diaphysis
 - myxoid chondrosarcoma in the ilium**
 - giant-cell tumor in the pubis
 - aneurysmal bone cyst in the periacetabular region
 - metastatic thyroid carcinoma to the proximal part of the humerus
- Weber KL.** Specialty update. What's new in musculoskeletal oncology. *J Bone Joint Surg Am.* 2004;86:1104.
- 15. At a minimum of five years postoperatively, a comparison of the anterior-posterior-glide and rotating-platform low contact stress mobile-bearing total knee arthroplasties demonstrated no significant differences in:**
- postoperative pain scores
 - flexion at the time of final follow-up
 - aseptic loosening
 - polyethylene wear
 - all of the above**
- Kim Y-H, Kim J-S.** Comparison of anterior-posterior-glide and rotating-platform low contact stress mobile-bearing total knee arthroplasties. *J Bone Joint Surg Am.* 2004;86:1239.
- 16. Which of the following statements is true:**

- A. the use of most technologies in orthopaedic surgery today is based on extensive data proving their clinical efficacy
- B. the cost-effectiveness of most orthopaedic technologies has been well documented in the literature
- C. spending on health-care technology represents one of the most significant drivers of health-care spending in the United States**
- D. in order to obtain 510k approval (pre-market notification) for a new device, it is necessary to prove clinical efficacy and cost-effectiveness relative to the gold standard technology
- E. orthopaedic surgeons rarely adopt and use new technologies until extensive data proving their safety and efficacy have been published in the literature
- Bozic KJ, Pierce RG, Herndon JH.** Current concepts review. Health care technology assessment. Basic principles and clinical applications. *J Bone Joint Surg Am.* 2004;86:1305.
- 17. Which statement is correct regarding developmental dysplasia of the hip:**
- A. selective ultrasonographic screening of infants with risk factors for hip dysplasia detects the majority of infants with persistent dysplasia
- B. selective ultrasonographic screening of infants with risk factors for hip dysplasia reduces rates of subsequent surgery
- C. delaying closed reduction of a dislocated hip until development of the ossific nucleus as seen on radiographs likely reduces the risk of postreduction osteonecrosis, but it may increase the necessity of secondary reconstructive procedures**
- D. long-term results of the Salter innominate osteotomy for hip dysplasia generally show excellent functional and radiographic results
- E. periacetabular osteotomy for hip dysplasia increases the radiographic anterior center-edge angle but does not increase the lateral center-edge angle
- Kocher MS, Sarwark JF.** Specialty update. What's new in pediatric orthopaedics. *J Bone Joint Surg Am.* 2004;86:1337.
- 18. For diabetic foot screening, monofilament testing of less than five plantar sites in each foot:**
- A. is associated with improved sensitivity
- B. is associated with improved specificity
- C. is more reliable than testing of all five sites on both feet
- D. performs well if a higher force is used
- E. performs well if a lower force is used**
- Saltzman C, Rashid R, Hayes A, Fellner C, Fitzpatrick D, Klapach A, Frantz R, Hillis SL.** 4.5-gram monofilament sensation beneath both first metatarsal heads indicates protective foot sensation in diabetic patients. *J Bone Joint Surg Am.* 2004;86:717.
- 19. The components of linear wear penetration, which are commonly used to assess polyethylene wear, include all of the following EXCEPT:**
- A. creep
- B. bedding-in of the liner into the modular acetabular shell
- C. removal of material (true wear)
- D. loading of the articulation
- E. method of component fixation**
- Heisel C, Silva M, dela Rosa MA, Schmalzried TP.** Short-term in vivo wear of cross-linked polyethylene. *J Bone Joint Surg Am.* 2004;86:748.
- 20. A recent study demonstrated a significant association between the findings of physical examination and the likelihood of arterial injury following knee dislocation. Physical examination had a:**
- A. negative predictive value of 0%
- B. negative predictive value of 100%**
- C. positive predictive value of 100%
- D. sensitivity of 90%
- E. positive predictive value of 0%
- Stannard JP, Sheils TM, Lopez-Ben RR, McGwin G Jr, Robinson JT, Volgas DA.** Vascular injuries in knee dislocations: the role of physical examination in determining the need for arteriography. *J Bone Joint Surg Am.* 2004;86:910.
- 21. In comparison with patients who report high health-related quality-of-life scores prior to total hip or knee arthroplasty, patients with low preoperative scores can expect:**
- A. less improvement
- B. greater improvement and greater final function
- C. greater improvement but a lower level of final function**
- D. more difficult rehabilitation
- E. higher satisfaction
- Ethgen O, Bruyere O, Richey F, Dardennes C, Reginster J-Y.** Health-related quality of life in total hip and total knee arthroplasty. A qualitative and systematic review of the literature. *J Bone Joint Surg Am.* 2004;86:963.
- 22. During total hip replacement, failure to restore femoral head offset is common. The consequences are:**
- A. higher joint reactive force
- B. decreased abductor strength
- C. greater risk of dislocation
- D. increased polyethylene wear rate
- E. all of the above**
- Charles MN, Bourne RB, Davey JR, Greenwald AS, Morrey BF, Rorabeck CH.** Instructional course lecture. Soft-tissue balancing of the hip. The role of femoral offset restoration. *J Bone Joint Surg Am.* 2004;86:1078.
- 23. A recent study demonstrated that the Lysholm knee scale used for various chondral disorders of the knee:**
- A. is the most reliable, valid, and responsive condition-specific knee outcome instrument used
- B. is more reliable, valid, and responsive than the Short Form-12, Western Ontario and McMaster Universities Osteoarthritis Index, and Tegner Activity Scale
- C. is a generic health-related quality-of-life scale
- D. demonstrates overall acceptable reliability, validity, and responsiveness**
- E. should be used instead of a generic outcome instrument or measures of patient satisfaction
- Kocher MS, Steadman JR, Briggs KK, Sterett WI, Hawkins RJ.** Reliability, validity, and responsiveness of the Lysholm Knee Scale for various chondral disorders of the knee. *J Bone Joint Surg Am.* 2004;86:1139.
- 24. After a mean duration of follow-up of ten years, successful revision with use of a cemented femo-**

- ral component was found to be associated with all of the following EXCEPT:**
- host bone quality
 - third-generation cementation techniques
 - younger patient age**
 - grade of the postoperative cement mantle
 - gender
- Haydon CM, Mehni R, Burnett S, Rorabeck CH, Bourne RB, McCalden RW, MacDonald SJ.** Revision total hip arthroplasty with use of a cemented femoral component. Results at a mean of ten years. *J Bone Joint Surg Am.* 2004;86:1179.
- 25. Performing vertebroplasty in the presence of an end-plate defect in the goat spine leads to:**
- disc degeneration
 - a condition similar to a Schmorl node**
 - an inflammatory reaction
 - early fragmentation of cement
 - loss of disc height
- Verlaan JJ, Oner FC, Sloopweg PJ, Verbout AJ, Dhert WJA.** Histologic changes after vertebroplasty. *J Bone Joint Surg Am.* 2004;86:1230.
- 26. Multimodal analgesia:**
- utilizes only pharmacologic approaches to pain management
 - utilizes only nonpharmacologic approaches to pain management
 - addresses multiple mechanisms of pain and reduces side effects through use of lower doses of individual modalities**
 - lengthens hospital stay
 - is a trend that is not thought to be useful in orthopaedic surgery
- Ekman EF, Koman LA.** Instructional course lecture. Acute pain following musculoskeletal injuries and orthopaedic surgery. Mechanisms and management. *J Bone Joint Surg Am.* 2004;86:1315.
- 27. If the entire median nerve trunk is severed at the level of the originating site of the anterior interosseous nerve, which of the following alignment approaches will provide the greatest opportunity for the proximal portion of the anterior interosseous nerve to grow into its distal portion?**
- coapting the distal stump of the anterior interosseous nerve to the proximal stump of the median nerve trunk randomly
 - coapting the distal stump of the anterior interosseous nerve to the posterior part of the proximal stump of the median nerve trunk**
 - coapting the distal stump of the anterior interosseous nerve to the central part of the proximal stump of the median nerve trunk
 - coapting the distal stump of the anterior interosseous nerve to the anterior part of the proximal stump of the median nerve trunk
 - coapting the distal stump of the anterior interosseous nerve to the lateral part of the proximal stump of the median nerve trunk
- Zhao Z, Lao J, Hung L-K, Zhang G-M, Zhang L-Y, Gu Y-D.** Selective neurotization of the median nerve in the arm to treat brachial plexus palsy. An anatomic study and case report. *J Bone Joint Surg Am.* 2004;86:736.
- 28. A fifty-year-old patient is diagnosed with a rotator cuff tear. The patient is male, is hypertensive, has diabetes mellitus, and has a body mass index of 34.6 kg/m². The level of blood urea nitrogen is 22 mg/dL (7.9 mmol/L); creatinine, 2.1 mg/dL (185.6 μmol/L); and nonfasting cholesterol, 260 mg/dL (6.7 mmol/L). Which of the following is most likely to have contributed to the rotator cuff tear in this patient?**
- diabetes mellitus
 - hypertension
 - hyperlipidemia
 - obesity**
 - renal failure
- Wendelboe AM, Hegmann KT, Gren LH, Alder SC, White GL Jr, Lyon JL.** Associations between body-mass index and surgery for rotator cuff tendinitis. *J Bone Joint Surg Am.* 2004;86:743.
- 29. In a comparison of the use of titanium elastic nails, traction, and immobilization in a spica cast for the treatment of femoral neck fractures in children, the use of titanium elastic nails was found to be associated with:**
- a higher rate of complications
 - a longer initial hospital stay
 - a significantly more rapid achievement of recovery milestones**
 - a better outcome at one year
 - substantially higher hospital charges
- Flynn JM, Luedtke LM, Ganley TJ, Dawson J, Davidson RS, Dormans JP, Ecker ML, Gregg JR, Horn BD, Drummond DS.** Comparison of titanium elastic nails with traction and a spica cast to treat femoral fractures in children. *J Bone Joint Surg Am.* 2004;86:770.
- 30. Which of the following was true when corticosteroids were injected into or around the Achilles tendon of rabbits?**
- Achilles tendons of rabbits injected bilaterally were mechanically weaker than those of rabbits injected unilaterally**
 - Achilles tendons of rabbits injected unilaterally were mechanically equivalent to those of rabbits injected bilaterally
 - Achilles tendons of rabbits injected unilaterally were mechanically weaker than those injected with a placebo
 - Achilles tendons of rabbits injected bilaterally were mechanically equivalent to those injected with a placebo
 - Achilles tendons of rabbits injected unilaterally were mechanically equivalent to those injected with a placebo
- Hugate R, Pennypacker J, Saunders M, Juliano P.** The effects of intratendinous and retrocalcaneal intrabursal injections of corticosteroid on the biomechanical properties of rabbit achilles tendons. *J Bone Joint Surg Am.* 2004;86:794.
- 31. In a recent study of 235 children with traumatic amputations, the most common cause was found to be:**
- lawnmowers**
 - farming equipment
 - motor-vehicle accidents
 - firecrackers or other explosive devices
 - burns
- Loder RT.** Demographics of traumatic amputations in children. Implications for prevention strategies. *J Bone Joint Surg Am.* 2004;86:923.

- 32. In a series of patients with stage-I or II osteonecrosis of the femoral head, those who underwent core decompression and implantation of autologous bone marrow cells were compared with those who underwent core decompression alone. The former treatment group had:**
- no difference in pain relief
 - no difference in joint symptoms
 - better bone stock for subsequent total hip arthroplasty
- D. less progression to stage-III changes**
- no change in the volume of the necrotic lesion
- Gangji V, Hauzeur J-P, Matos C, De Maertelaer V, Toungouz M, Lambermont M.** Treatment of osteonecrosis of the femoral head with implantation of autologous bone-marrow cells. A pilot study. *J Bone Joint Surg Am.* 2004;86:1153.
- 33. Which of the following factors is the most important to ensure a good lifelong result following surgical correction of clubfoot?**
- range of sagittal motion of the hindfoot
- B. preservation of functional mobility of the subtalar joint**
- complete anatomical correction
 - absence of pain in adolescence
 - normal anteroposterior talocalcaneal (Kite) angle
- Huber H, Dutoit M.** Dynamic foot-pressure measurement in the assessment of operatively treated clubfeet. *J Bone Joint Surg Am.* 2004;86:1203.
- 34. What is the most common mode of failure following rotator cuff repairs with use of suture-anchors?**
- suture pull-out from tendon**
 - anchor pull-out from bone
 - new rotator cuff tear
 - suture breakage
 - anchor breakage
- Ma CB, MacGillivray JD, Clabeaux J, Lee S, Otis JC.** Biomechanical evaluation of arthroscopic rotator cuff stitches. *J Bone Joint Surg Am.* 2004;86:1211.
- 35. In a reconstruction of a posterior cruciate ligament with a two-bundle technique, the anterior-distal, middle-middle configuration most effectively:**
- secures fixation of the bundles
- B. reduces peak bundle tension**
- reduces bundle tension slope
 - prevents posterior translation
 - normalizes load-sharing configuration
- Shearn JT, Grood ES, Noyes FR, Levy MS.** Two-bundle posterior cruciate ligament reconstruction: how bundle tension depends on femoral placement. *J Bone Joint Surg Am.* 2004;86:1262.
- 36. Clinically retrieved highly cross-linked polyethylene acetabular liners have demonstrated:**
- surface wear patterns similar to those seen in hip-simulator studies
- B. surface defects not typically observed in hip-simulator studies**
- high volumetric wear rates
 - fatigue failure mechanisms
 - liner-locking mechanism dissociation
- Bradford L, Baker DA, Graham J, Chawan A, Ries MD, Pruitt LA.** Wear and surface cracking in early retrieved highly cross-linked polyethylene acetabular liners. *J Bone Joint Surg Am.* 2004;86:1271.
- 37. In a multilevel thoracoscopy-assisted anterior thoracic fusion model, intervertebral fusion was most consistently achieved with which of the following graft materials?**
- collagen-hydroxyapatite/tricalcium phosphate (composite carrier)
 - autologous iliac crest
 - autologous rib
- D. rhBMP-2 on a collagen/composite carrier**
- no graft material
- Sucato DJ, Hedequist D, Zhang H, Pierce WA, O'Brien SE, Welch RD.** Recombinant human bone morphogenetic protein-2 enhances anterior spinal fusion in a thoracoscopically instrumented animal model. *J Bone Joint Surg Am.* 2004;86:752.
- 38. The addition of a hydroxyapatite coating to a proximally porous-coated tapered femoral stem:**
- prevents subsidence of the stem
 - reduces aseptic loosening
 - decreases distal osteolysis
 - improves osseointegration of the femoral stem
- E. has no influence on the outcome of total hip arthroplasty at a mean of ten years postoperatively**
- Parvizi J, Sharkey PF, Hozack WJ, Orzoco F, Bissett GA, Rothman RH.** Prospective matched-pair analysis of hydroxyapatite-coated and uncoated femoral stems in total hip arthroplasty. A concise follow-up of a previous report. *J Bone Joint Surg Am.* 2004;86:78.
- 39. Appropriate treatment of foot ulcers in diabetic patients includes:**
- local wound care
 - pressure relief with a total contact cast
 - vacuum-assisted closure
 - surgical débridement and tissue flap coverage
- E. all of the above**
- Sauer ST, Marymont JV, Mizel MS.** Specialty update. What's new in foot and ankle surgery. *J Bone Joint Surg Am.* 2004;86:878.
- 40. In a study of patients who had undergone total knee arthroplasty more than five years previously, it was found that, compared with patients who had had regular follow-up evaluations, those who had been lost to follow-up after six months postoperatively were:**
- more likely to have had revision surgery
 - more likely to be dissatisfied with the outcome of the surgery
 - found to have poorer pain relief and function outcome scores
- D. statistically similar with regard to revision rate, satisfaction rate, and outcome scores for pain and function when compared with their counterparts who were not lost to follow-up**
- less likely to be dissatisfied with the outcome of the surgery
- King PJ, Malin AS, Scott RD, Thornhill TS.** The fate of patients not returning for follow-up five years after total knee arthroplasty. *J Bone Joint Surg Am.* 2004;86:897.
- 41. Which of the following factors has been found to increase intramedullary temperatures of bone with reaming?**
- size of the reamers
 - use of tourniquet ischemia during reaming

- C. design of the reamers
D. use of worn reamers
 E. duration of reaming
Riquelme Garcia OG, Mombiola FL, de la Fuente CJ, Aranguez MG, Escribano DV, Martin JV. The influence of the size and condition of the reamers on bone temperature during intramedullary reaming. *J Bone Joint Surg Am.* 2004; 86:994.
- 42. In a recent study, the clinical wear performance of conventional polyethylene sterilized with gamma irradiation (either in vacuum-barrier packaging or in air) was superior to the performance of non-irradiated gas-plasma-sterilized components. This result supports the hypothesis that:**
 A. oxidation increases polyethylene wear
B. increased cross-linking decreases polyethylene wear
 C. shelf life affects polyethylene wear
 D. gas-plasma sterilization increases polyethylene wear
 E. differences in structure affect polyethylene wear
Sychterz CJ, Orishimo KF, Engh CA. Sterilization and polyethylene wear: clinical studies to support laboratory data. *J Bone Joint Surg Am.* 2004;86:1017.
- 43. Which of the following types of surgical treatment of inferior patellar pole avulsion fractures best accomplishes the goals of retaining the fragments, maintaining normal patellar height, immediately mobilizing the knee joint, and early weight-bearing?**
 A. six weeks of immobilization in a plaster cast
 B. internal fixation with a compression screw or screws and cerclage wire
 C. internal fixation with two cerclage wires
D. internal fixation with a basket plate
 E. removal of the patellar pole and repair of the patellar tendon
Kastelec M, Veselko M. Inferior patellar pole avulsion fractures: osteosynthesis compared with pole resection. *J Bone Joint Surg Am.* 2004;86:696.
- 44. The presence of a dorsal flange on a cemented femoral stem results in:**
 A. decreased stem-cement interlock and decreased bone-cement micromotion
 B. decreased stem-cement interlock and increased bone-cement micromotion
 C. increased stem-cement interlock and decreased bone-cement micromotion
D. increased stem-cement interlock and increased bone-cement micromotion
 E. reduced strains of the medial femoral surface and increased stress-shielding
Sangiorgio SN, Ebrahimzadeh E, Longjohn DB, Dorr LD. Effects of dorsal flanges on fixation of a cemented total hip replacement femoral stem. *J Bone Joint Surg Am.* 2004;86:813.
- 45. The presentation of osteomyelitis in neonates differs from that in children because neonates are more likely to present with:**
 A. an elevated white blood-cell count
 B. an elevated erythrocyte sedimentation rate
C. a false-negative bone scan
 D. an increased temperature
- E. pain with hip rotation
McCarthy JJ, Dormans JP, Kozin SH, Pizzutillo PD. Instructional course lecture. Musculoskeletal infections in children. Basic treatment principles and recent advancements. *J Bone Joint Surg Am.* 2004;86:850.
- 46. In an experimental model using intact human elbows with intact collateral ligaments, a valgus and supination torque was applied after resection of the radial head and 30% of the height of the coronoid process. The outcome was:**
 A. almost normal stability
 B. significant posterolateral rotatory laxity only when there was additional insufficiency of the lateral ulnar collateral ligament
 C. restoration of almost normal stability with insertion of a bipolar radial head prosthesis (Judet prosthesis) alone
D. restoration of almost normal stability with insertion of a rigid radial head prosthesis alone
 E. restoration of normal stability with insertion of a rigid radial head replacement and reconstruction of the coronoid process
Schneeberger AG, Sadowski MM, Jacob HAC. Coronoid process and radial head as posterolateral rotatory stabilizers of the elbow. *J Bone Joint Surg Am.* 2004;86:975.
- 47. The most appropriate interpretation of a decrease in the anteroposterior translation of the tibia, as measured with a KT-1000 arthrometer, following surgical reconstruction of the anterior cruciate ligament is:**
 A. the surgery successfully restored the tibiofemoral kinematics
 B. osteoarthritis is not likely to develop
 C. the ligament graft was placed anatomically
D. tibial motion is restricted but the tibiofemoral relationship may not be normal
 E. contracture of the secondary stabilizers of the anterior cruciate ligament has occurred
Almekinders LC, Pandarinath R, Rahusen FT. Knee stability following anterior cruciate ligament rupture and surgery. The contribution of irreducible tibial subluxation. *J Bone Joint Surg Am.* 2004;86:983.
- 48. In accordance with Wolff's law, the remodeling characteristics of thoracic spinal facets in patients with scoliosis demonstrate which of the following electron microscopic features?**
 A. facets on the concave side of the curve demonstrate an increase in cortical thickness and an increase in porosity in comparison with facets on the convex side of the curve
B. facets on the concave side of the curve demonstrate an increase in cortical thickness and a decrease in porosity in comparison with facets on the convex side of the curve
 C. facets on the concave side of the curve demonstrate a decrease in cortical thickness and a decrease in porosity in comparison with facets on the convex side of the curve
 D. facets on the convex side of the curve demonstrate an increase in cortical thickness and a decrease in porosity in comparison with facets on the concave side of the curve
 E. facets on the convex side of the curve demonstrate

equal changes in cortical thickness and porosity in comparison with facets on the concave side of the curve

Shea KG, Ford T, Bloebaum RD, D'Astous J, King H. A comparison of the microarchitectural bone adaptations of the concave and convex thoracic spinal facets in idiopathic scoliosis. *J Bone Joint Surg Am.* 2004;86:1000.

- 49. A forty-five-year-old man sustained a highly comminuted radial head fracture that is not amenable to primary open reduction and internal fixation. He had a neutral ulnar variance prior to the injury. The patient is treated with radial head excision and reconstruction with a metal radial head implant that is 4 mm shorter than the native radial head that was excised. Which of the following conditions is most likely to increase relative force transmission through the ulna on application of an axial load force?**

- A. forearm supination
- B. forearm pronation
- C. elbow in varus alignment
- D. wrist extension

E. rupture of the interosseous membrane

Markolf KL, Tejwani SG, O'Neil G, Benhaim P. Load-sharing at the wrist following radial head replacement with a metal implant. A cadaveric study. *J Bone Joint Surg Am.* 2004;86:1023.

- 50. With regard to arthrodesis of the metatarsophalangeal joint as a salvage procedure following a failed Keller bunionectomy that presents with a painful cock-up toe deformity, which of the following statements is most correct?**

- A. the preexisting deformity is likely to recur within two years
- B. this type of procedure addresses the underlying problem of instability**
- C. this procedure allows immediate weight-bearing in regular shoes
- D. this is an easy technique with a negligible rate of complications
- E. this procedure has no influence on concomitant transfer metatarsalgia

Machacek F, Jr, Easley ME, Gruber F, Ritschl P, Trnka H-J. Salvage of a failed Keller resection arthroplasty. *J Bone Joint Surg Am.* 2004;86:1131.

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 | |

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