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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 JULY 15, 2005.

- 1. A seventy-two-year-old woman slips and falls in her kitchen and sustains a hip fracture. The best strategy for maximizing the likelihood that this patient will receive appropriate osteoporosis treatment includes:**
- directly involving the patient in her own health care through education and self-advocacy**
 - mailing guidelines to local primary care physicians
 - obtaining a DEXA scan on an in-patient basis
 - immediately initiating bisphosphonate therapy
 - scheduling an appointment at the fracture clinic within one week postoperatively
- Gardner MJ, Brophy RH, Demetrikopoulos D, Koob J, Hong R, Rana A, Lin JT, Lane JM. Interventions to improve osteoporosis treatment following hip fracture. A prospective, randomized trial. *J Bone Joint Surg Am.* 2004;86:3.
- 2. In the periarticular soft tissues retrieved during revision of failed metal-on-metal total hip prostheses:**
- plasma cells were seen in all tissues from metal-on-metal prostheses
 - plasma cells were seen only in association with perivascular lymphocytic cuffs
 - plasma cells were seen only in association with macrophages laden with metallic debris from metal-on-metal prostheses**
 - plasma cells were found in tissues from cobalt chromium-on-polyethylene prostheses
 - the condition of the tissue surface was closely related to the extent of the plasma cell infiltrate
- Davies AP, Willert HG, Campbell PA, Learmonth ID, Case CP. An unusual lymphocytic perivascular infiltration in tissues around contemporary metal-on-metal joint replacements. *J Bone Joint Surg Am.* 2004;86:18.
- 3. Which of the following molecules is a marker of chondrocyte dedifferentiation following human autologous chondrocyte transplantation?**
- cathepsin B**
 - collagen II
 - collagen X
 - Egr-1
 - Sox-9
- Grigolo B, Roseti L, De Franceschi L, Piacentini A, Cattini L, Manfredini M, Faccini R, Facchini A. Molecular and immunohistological characterization of human cartilage two years following autologous cell transplantation. *J Bone Joint Surg Am.* 2004;86:46.
- 4. Which of the following factors is the main reason for loss of elbow and forearm strength following radial head resection because of a comminuted fracture of the radial head?**
- wrist and forearm pain with resultant ulnar abutment
 - valgus elbow deformity
 - osteoarthritis of the elbow
 - lack of proximal support of the radiocapitellar articulation**
 - restricted elbow joint mobility
- Ikeda M, Sugiyama K, Kang C, Takagaki T, Oka Y. Comminuted fractures of the radial head. Comparison of resection and internal fixation. *J Bone Joint Surg Am.* 2004;86:76.
- 5. Which of the following combinations of bone-graft substitutes has been shown to be effective as prophylaxis against infection in a goat fracture model that was contaminated with *Staphylococcus aureus*?**
- calcium sulfate and demineralized bone matrix
 - calcium sulfate
 - tobramycin-impregnated polymethylmethacrylate
 - tobramycin-impregnated calcium sulfate and demineralized bone matrix**
 - demineralized bone matrix
- Beardmore AA, Brooks DE, Wenke JC, Thomas DB. Effectiveness of local antibiotic delivery with an osteoinductive and osteoconductive bone-graft substitute. *J Bone Joint Surg Am.* 2004;86:107.
- 6. Which of the following medications, when given intra-articularly, has been shown to be most effective in reducing postoperative pain following anterior cruciate ligament reconstruction?**
- methadone
 - morphine**
 - hyalogen
 - corticosteroid
 - saline solution
- Stewart DJ, Lambert EW, Stack KM, Pellegrini J, Unger DV, Hood RJ. The effect of intra-articular methadone on postoperative pain following anterior cruciate ligament reconstruction. *J Bone Joint Surg Am.* 2004;86:140.
- 7. A sixty-three-year-old woman was treated with humeral head replacement for a head-splitting proximal humeral fracture six months ago. During a recent evaluation, she reported increasing pain, loss of strength, and loss of active motion of the operatively treated shoulder. She can actively flex and externally rotate the shoulder to 40° and 20°, respectively. Passively, shoulder flexion and external rotation are 140° and 40°, respectively. Radiographs are unremarkable. The next step in the management may include:**
- electromyographic and nerve-conduction-velocity examination
 - arthrography**
 - additional physical therapy focusing on stretching exercises
 - laboratory evaluation including a complete blood-cell count, measurement of the C-reactive protein level, and measurement of the erythrocyte sedimentation rate
 - arthroscopic lysis of adhesions and scar tissue
- Plausinis D, Kwon YW, Zuckerman JD. Complications of humeral head replacement for proximal humeral fractures. *J Bone Joint Surg Am.* 2004;86:204.
- 8. Which of the following restrictions was**

- found to be the most important in preventing early dislocation following total hip arthroplasty?**
- abduction pillow
 - no side-sleeping
 - no driving
 - limitation of hip flexion**
 - use of elevated chairs/toilet seats
- Peak EL, Parvizi J, Ciminiello M, Purtill JJ, Sharkey PF, Hozack WJ, Rothman RH. The role of patient restrictions in reducing the prevalence of early dislocation following total hip arthroplasty. A randomized, prospective study. *J Bone Joint Surg Am.* 2004;86:247.
- 9. When the twenty-year results of total hip arthroplasty performed with filling of the superolateral defect of the acetabulum with cement in patients with congenital hip dislocation were compared with the twenty-year results of total hip arthroplasty performed for hip arthritis with other causes, it was found that:**
- the results were comparable**
 - the results were better in the former group
 - the results depended on the amount of cement coverage
 - the results depended on the femoral deformity
 - the results were markedly worse in the former group
- Klapach AS, Callaghan JJ, Miller KA, Goetz DD, Sullivan PM, Pedersen DR, Johnston RC. Total hip arthroplasty with cement and without acetabular bone graft for severe hip dysplasia. A concise follow-up, at a minimum of twenty years, of a previous report. *J Bone Joint Surg Am.* 2004;86:280.
- 10. When patients with lower-extremity sarcoma were treated with limb-salvage surgery combined with high-dose postoperative external beam radiation therapy, they were noted to have:**
- an increased rate of pulmonary metastases
 - an increased rate of perioperative wound complications
 - an increased rate of local recurrence
 - a decreased rate of fractures
 - an increased rate of fractures**
- Holt GE, Griffin AM, Pintilie M, Wunder JS, Catton C, O'Sullivan B, Bell RS. Fractures following radiotherapy and limb-salvage surgery for lower extremity soft-tissue sarcomas. A comparison of high-dose and low-dose radiotherapy. *J Bone Joint Surg Am.* 2004;86:315.
- 11. In a review of the records at an academic medical center, inadequate documentation was found for at least 70% of patients with compartment syndrome. The most common undocumented finding (excluding the category of pallor) was:**
- weakness
 - pain
 - compartment pressure
 - diastolic blood pressure**
 - pulses
- Cascio BM, Wilckens JH, Ain MC, Toulson C, Frassica FJ. Documentation of acute compartment syndrome at an academic health-care center. *J Bone Joint Surg Am.* 2004;86:346.
- 12. Which is the most common fatal complication of neurofibromatosis?**
- nonossifying fibroma
 - schwannoma
 - malignant peripheral nerve sheath tumor**
 - malignant fibrous histiocytoma
 - plexiform neurofibroma
- Papagelopoulos PJ, Mavrogenis AF, Galanis EC, Chloros GD, Papaparaskeva KT. Malignant fibrous histiocytoma of bone associated with type-1 neurofibromatosis. A case report. *J Bone Joint Surg Am.* 2004;86:399.
- 13. Surgical options for restoration of stability in a patient with recurrent anterior glenohumeral instability due to a large (>30%) osseous Bankart lesion that involves the anteroinferior aspect of the glenoid include all of the following except:**
- Bristow procedure
 - Latarjet procedure
 - arthroscopic Bankart repair**
 - iliac crest bone-graft reconstruction
 - primary fixation of the fragment and capsulorrhaphy
- Millett PJ, Clavert P, Warner JJR. Current concepts review. Open operative treatment for anterior shoulder instability: when and why?. *J Bone Joint Surg Am.* 2004;86:419.
- 14. Patients who sustain a fracture of the femoral neck and have a correctable acute medical comorbidity:**
- should nevertheless undergo immediate operative intervention
 - should undergo surgery within twenty-four hours to prevent progression of the acute medical condition
 - should be maximally optimized before being operated on**
 - should have surgery within four days after the fracture because mortality rates rise after the fifth day
 - should have surgery within four days after optimization of the medical condition
- Moran CG, Wenn RT, Sikand M, Taylor AM. Early mortality after hip fracture: is delay before surgery important?. *J Bone Joint Surg Am.* 2004;86:483.
- 15. In a randomized study of the results three months after injection of botulinum toxin for the treatment of tennis elbow, the authors found that, compared with controls, patients who had received the botulinum injection had:**
- better grip strength
 - a persistent extensor lag
 - less pain
 - a lower Short Form-12 score for physical function
 - no significant differences**

Hayton MJ, Santini AJA, Hughes PJ, Frostick SP, Trail IA, Stanley JK. Botulinum toxin injection in the treatment of tennis elbow. A double-blind, randomized, controlled, pilot study. *J Bone Joint Surg Am.* 2004;86:503.

16. On the average, an extended trochanteric osteotomy decreases the torsional strength of a femur by about:

- A. 10%
- B. 20%
- C. 50%
- D. **70%**
- E. 90%

Noble AR, Branham DB, Willis MC, Owen JR, Cramer BW, Wayne JS, Jiranek WA. Mechanical effects of the extended trochanteric osteotomy. *J Bone Joint Surg Am.* 2004;86:521.

17. A thirteen-year-old Amish boy presents with a five-month history of groin pain. A diagnosis of slipped capital femoral epiphysis is made. You inform the parents that, compared with non-Amish white children with slipped capital femoral epiphysis, Amish children with the disorder have:

- A. **a higher prevalence of bilaterality and a higher prevalence of positive family history**
- B. a higher prevalence of bilaterality and a lower prevalence of positive family history
- C. a lower prevalence of bilaterality and a higher prevalence of positive family history
- D. a lower prevalence of bilaterality and a lower prevalence of positive family history
- E. the same prevalence of bilaterality and the same prevalence of positive family history

Loder RT, Nechleba J, Sanders JO, Doyle P. Idiopathic slipped capital femoral epiphysis in Amish children. *J Bone Joint Surg Am.* 2004;86:543.

18. Which of the following distal femoral fracture patterns is most likely to be associated with an open traumatic wound?

- A. supracondylar distal femoral fracture (AO/OTA 33-A)
- B. supracondylar-intercondylar distal femoral fracture without comminution (AO/OTA 33-C1)
- C. supracondylar-intercondylar distal femoral fracture with supracondylar comminution (AO/OTA 33-C2)
- D. supracondylar-intercondylar distal femoral fracture with a lateral coronal plane fracture (AO/OTA 33-C3)

E. supracondylar-intercondylar distal femoral fracture with medial and lateral coronal plane fractures (AO/OTA 33-C3)

Nork SE, Segina DN, Aflatoon K, Barei DP, Henley MB, Holt S, Benirschke SK. The association between supracondylar-intercondylar distal femoral fractures and coronal plane fractures. *J Bone Joint Surg Am.* 2004;86:564.

19. Which of the following factors may decrease the risk of thermal injury during ultrasonic cement removal?

- A. use of short bursts of energy

- B. constant motion of the ultrasonic device within the cement mantle
- C. frequent irrigation between passes of the ultrasonic probe
- D. deflation of the tourniquet
- E. **all of the above**

Goldberg SH, Cohen MS, Young M, Bradnock B. Thermal tissue damage caused by ultrasonic cement removal from the humerus. *J Bone Joint Surg Am.* 2004;86:583.

20. In HIV-positive patients with spinal infection, which of the following best predicts severity of illness?

- A. white blood-cell count of $>15 \times 10^9/L$ on initial presentation
- B. Duration of HIV infection
- C. **CD4 count of $<50/mm^3$**
- D. infection with *Staphylococcus aureus*
- E. presence of osteomyelitis

Weinstein MA, Eismont FJ. Infections of the spine in patients with human immunodeficiency virus. *J Bone Joint Surg Am.* 2004;86:604.

21. You make a diagnosis of posterior dislocation of the shoulder in a male patient within twenty-four hours after the injury. Radiographs show a small humeral head defect. All of the following statements are true, except:

- A. a good functional outcome is anticipated following relocation
- B. an osteochondral fracture of the anterior part of the humeral head is likely
- C. spontaneous relocation is unlikely
- D. **closed reduction should not be attempted**
- E. restriction of external rotation of the shoulder is a useful diagnostic sign

Robinson CM, Aderinto J. Current concepts review. Posterior shoulder dislocations and fracture-dislocations. *J Bone Joint Surg Am.* 2004;86:639.

22. Which of the following is considered to be the gold-standard suturing technique for meniscal repair?

- A. all-inside absorbable implant
- B. second-generation flexible all-inside tensioned absorbable implant
- C. horizontal mattress suture
- D. **vertical mattress suture**
- E. fibrin glue

Montgomery SC, Miller MD. Specialty update. What's new in sports medicine. *J Bone Joint Surg Am.* 2004;86:686.

23. To avoid substantial radiation exposure while operating a miniature c-arm device, a surgeon should maintain at least what distance from the beam?

- A. 5 cm
- B. 10 cm
- C. **20 cm**
- D. 30 cm
- E. 40 cm

Badman BL, Rill L, Butkovich B, Arreola M, Vander Griend

RA. Radiation exposure with use of the mini-c-arm for routine orthopaedic imaging procedures. *J Bone Joint Surg Am.* 2004;86:13.

24. Following total hip arthroplasty with a metal-on-metal articulation, hypersensitivity reactions to wear and repassivation products may develop in some patients. If hypersensitivity is established as the cause of bursa formation, pain, or bone resorption, a surgeon should consider:

- A. reassuring the patient and waiting for relief of symptoms
- B. suppressing the reactions with drug therapy
- C. **replacing the articulation with a different articulation device that does not liberate nickel, cobalt, or chromium ions**
- D. advising the patient to limit activity in order to reduce the rate of wear
- E. treating the osteolytic lesions (resecting the granuloma, refreshing the bone surfaces until bleeding occurs, bone-grafting, and using cementing techniques) so that implant stability is not jeopardized

Willert H-G, Buchhorn GH, Fayyazi A, Flury R, Windler M, Köster G, Lohmann CH. Metal-on-metal bearings and hypersensitivity in patients with artificial hip joints. A clinical and histomorphological study. *J Bone Joint Surg Am.* 2004;86:28.

25. The amount of pain and functional impairment, as measured with the Short Form-36, in patients about to undergo bunion surgery:

- A. correlated with the severity of the hallux valgus angle
- B. correlated with the intermetatarsal 1-2 angle
- C. inversely correlated with the hallux valgus angle
- D. inversely correlated with the intermetatarsal 1-2 angle
- E. **did not correlate with the severity of the hallux valgus or intermetatarsal 1-2 angle**

Thordarson DB, Ebramzadeh E, Rudicel SA, Baxter A. Age-adjusted baseline data for women with hallux valgus undergoing corrective surgery. *J Bone Joint Surg Am.* 2004;86:66.

26. Of the following determinants of glenoid capacity, which is the most important in providing containment of the glenohumeral joint in patients with atraumatic posteroinferior multidirectional instability?

- A. **height of the posteroinferior aspect of the labrum**
- B. depth of the osseous glenoid
- C. height of the anteroinferior aspect of the labrum
- D. width of the osseous glenoid
- E. thickness of the articular cartilage of the glenoid

Kim S-H, Noh K-C, Park J-S, Ryu B-D, Oh I. Loss of chondrolabral containment of the glenohumeral joint in atraumatic posteroinferior multidirectional instability. *J Bone Joint Surg Am.* 2004;86:92.

27. Which factor is least associated with patient

satisfaction following surgical repair of the rotator cuff?

- A. tear size
- B. **age**
- C. forward elevation at the time of follow-up
- D. ASES (American Shoulder and Elbow Surgeons) score
- E. work disability

O'Holleran JD, Kocher MS, Horan MP, Briggs KK, Hawkins RJ. Determinants of patient satisfaction with outcome after rotator cuff surgery. *J Bone Joint Surg Am.* 2004;86:121.

28. High NADH (nicotinamide adenine dinucleotide) autofluorescence in skeletal muscle indicating soft-tissue trauma-induced tissue hypoxia is negatively correlated with:

- A. inflammatory cell response
- B. **functional capillary density**
- C. location of soft-tissue trauma
- D. parecoxib blood concentration
- E. mean arterial blood pressure

Gierer P, Mittlmeier T, Bordel R, Schaser K-D, Gradl G, Vollmar B. Selective cyclooxygenase-2 inhibition reverses microcirculatory and inflammatory sequelae of closed soft-tissue trauma in an animal model. *J Bone Joint Surg Am.* 2004;86:153.

29. Different suture constructs were studied in a cadaveric model of rotator cuff repair. Which of the following had the greatest influence on the security of the repair?

- A. suture size
- B. suture material (braided or monofilament)
- C. suture material (permanent or resorbable)
- D. number of knots across the repair site
- E. **suture construct (simple or mattress)**

Gartsman GM, Hasan SS. Specialty update. What's new in shoulder and elbow surgery. *J Bone Joint Surg Am.* 2004;86:226.

30. When liquid gentamicin is added to cement, all but one of the following statements are true:

- A. it maintains bacteriocidal activity
- B. it is eluted effectively from cement
- C. it can be used in cement spacers
- D. it is cost-effective when compared with tobramycin
- E. **it can be used to reimplant prosthetic components**

Seldes RM, Winiarsky R, Jordan LC, Baldini T, Brause B, Sculco TP, Zodda F. Liquid gentamicin in bone cement: a laboratory study of a potentially more cost-effective cement spacer. *J Bone Joint Surg Am.* 2004;86:268.

31. The effect of bisphosphonates in patients undergoing total hip and knee arthroplasty is best described as follows:

- A. bisphosphonates lead to significant decreases in bone mineral density when compared with control values
- B. bisphosphonates have no effect on bone mineral density in patients undergoing hip and knee arthroplasty
- C. **patients taking bisphosphonates will have sig-**

- nificantly greater bone mineral density values at one year after surgery compared with the bone mineral density at the time of surgery
- D. bisphosphonates lead to significantly less periprosthetic bone loss (bone mineral density) than that in controls**
- E. bisphosphonates are contraindicated in any patient undergoing joint arthroplasty
Bhandari M, Bajammal S, Guyatt GH, Griffith L, Busse JW, Schünemann H, Einhorn TA. Effect of bisphosphonates on periprosthetic bone mineral density after total joint arthroplasty. A meta-analysis. *J Bone Joint Surg Am.* 2004;86:293.
- 32. Which of the following findings would be inconsistent with protrusions of polyethylene from the backside of tibial inserts through screw-holes in the tibial base-plate being caused by wear of the insert?**
- A. distinct, eroded transition between the backside surface in contact with the tibial tray and the backside surface opposite screw-holes
B. the height of the protrusions does not increase with thinner tibial inserts
C. the protrusions have an oblong shape, while the screw-holes are round
- D. the height of the protrusions increases under areas of higher compressive loads**
- E. an increased prevalence of osteolysis along fixation screws
Conditt MA, Thompson MT, Usrey MM, Ismaili SK, Noble PC. Backside wear of polyethylene tibial inserts: mechanism and magnitude of material loss. *J Bone Joint Surg Am.* 2004;86:326.
- 33. An analysis of chondrocyte death following harvest of a human femoral osteochondral graft showed:**
- A. less cell death with "power-harvesting" techniques
B. cell death occurring only near the tidemark
C. cell death associated with the wound edge
- D. no increase in the rate of marginal cell death between fifteen and 120 minutes post-harvest**
- E. uniform distribution of cell death across the cartilage surface
Huntley JS, Bush PG, McBirnie JM, Simpson AH, Hall AC. Chondrocyte death associated with human femoral osteochondral harvest as performed for mosaicplasty. *J Bone Joint Surg Am.* 2004;86:351.
- 34. When compared with patients with discrete arm pain, patients with vague, diffuse idiopathic (nonspecific) arm pain were found to be more likely to:**
- A. have increased attention to internal physical sensations (private body consciousness)
B. believe that their health was dependent on external forces or other people (such as doctors)
C. complain of substantially greater pain when lifting a heavy object
- D. demonstrate poor coping mechanisms (increased catastrophizing)**
- E. have substantially fewer somatic symptoms
Ring D, Kadzielski J, Malhotra L, Lee S-GP, Jupiter JB. Psychological factors associated with idiopathic arm pain. *J Bone Joint Surg Am.* 2004;86:374.
- 35. What combination of metabolic abnormalities constitutes the triad of death?**
- A. hyperthermia, acidosis, coagulopathy
B. hypothermia, alkalosis, coagulopathy
- C. hypothermia, acidosis, coagulopathy**
- D. hyperthermia, alkalosis, coagulopathy
E. normothermia, acidosis, coagulopathy
Roberts CS, Pape H-C, Jones AL, Malkani AL, Rodriguez JL, Giannoudis PV. Instructional course lecture. Damage control orthopaedics. Evolving concepts in the treatment of patients who have sustained orthopaedic trauma. *J Bone Joint Surg Am.* 2004;86:434.
- 36. In one study, the diagnosis made by the examining orthopaedic surgeon was more accurate than that made by a radiologist interpreting a magnetic resonance image for all of the following knee injuries in children except:**
- A. anterior cruciate ligament tears
B. lateral meniscal tears
C. osteochondritis dissecans
D. discoid lateral meniscus
- E. medial meniscal tears**
Luhmann SJ, Schootman M, Gordon JE, Wright RW. Magnetic resonance imaging of the knee in children and adolescents. Its role in clinical decision-making. *J Bone Joint Surg Am.* 2004;86:497.
- 37. In a study comparing complication rates among patients who had undergone bilateral knee replacement in one stage (sequential), in two stages during one hospitalization (staggered), or in two stages at a minimum of six weeks apart (staged), it was found that:**
- A. the overall rate was lowest in the group treated in two stages during one hospitalization (staggered)**
- B. the overall rate was lowest in the group treated in one stage (sequential)
C. the overall rate was lowest in the group treated in two stages during two hospitalizations (staged)
D. the rate of major complications was highest in the group treated in two stages during one hospitalization (staggered)
E. the rate of major complications was highest in the group treated in two stages during two hospitalizations (staged)
Sliva CD, Callaghan JJ, Goetz DD, Taylor SG. Staggered bilateral total knee arthroplasty performed four to seven days apart during a single hospitalization. *J Bone Joint Surg Am.* 2004;86:508.
- 38. Perioperative administration of nonsteroidal anti-inflammatory drugs to patients undergoing spinal fusion surgery was**

- found to be associated with which of the following?**
- increased postoperative opioid use
 - increased hospitalization rates
 - reduction in postoperative pain**
 - increased frequency of postoperative nausea and vomiting
 - reduction in chronic pain syndromes
- Reuben SS, Ekman EF. The effect of cyclooxygenase-2 inhibition on analgesia and spinal fusion. *J Bone Joint Surg Am.* 2004;86:536.
- 39. Bisphosphonates may prevent femoral head deformity following ischemic necrosis in pigs through which mechanism?**
- stimulating revascularization and appositional new bone formation
 - decreasing pain and mechanical fragmentation of the femoral head
 - strengthening necrotic bone through a physiochemical mechanism
 - preserving the trabecular framework of the femoral head by inhibiting bone resorption**
 - stimulating recruitment of osteoblast precursors to the site of repair
- Kim HKW, Randall TS, Bian H, Jenkins J, Garces A, Bauss F. Ibandronate for prevention of femoral head deformity after ischemic necrosis of the capital femoral epiphysis in immature pigs. *J Bone Joint Surg Am.* 2004;86:550.
- 40. Of the following hospital cost centers, which one is associated with the highest amount of resource utilization for primary and revision total hip arthroplasty?**
- blood bank
 - rehabilitative services
 - radiology
 - operating room equipment and implants**
 - operating room time and staff
- Bozic KJ, Katz P, Cisternas M, Ono L, Ries MD, Showstack J. Hospital resource utilization for primary and revision total hip arthroplasty. *J Bone Joint Surg Am.* 2004;86:570.
- 41. In a study examining ultrasonic cement removal from human cadaveric humeri, the magnitude and rate of temperature elevation in surrounding tissue from greatest to least was:**
- bone, radial nerve, triceps muscle**
 - radial nerve, bone, triceps muscle
 - radial nerve, triceps muscle, bone
 - triceps muscle, bone, radial nerve
 - bone, median nerve, biceps muscle
- Goldberg SH, Cohen MS, Young M, Bradnock B. Thermal tissue damage caused by ultrasonic cement removal from the humerus. *J Bone Joint Surg Am.* 2004;86:583.
- 42. Which of the following complications of anterior cervical spine surgery is likely to occur more frequently when ossification of the posterior longitudinal ligament is encountered?**
- Brown-Séquard syndrome
 - spinal fluid leakage**
 - vertebral artery injury
 - postoperative kyphosis
 - esophageal perforation
- Belanger TA, Roh JS, Hanks SE, Kang JD, Emery SE, Bohlman HH. Ossification of the posterior longitudinal ligament. Results of anterior cervical decompression and arthrodesis in sixty-one North American patients. *J Bone Joint Surg Am.* 2004;86:610.
- 43. What is the most common deficiency of orthopaedic surgeons with regard to communicating with their patients?**
- expressing confidence
 - educating patients
 - orienting patients
 - empathetic response**
 - enlisting patients
- Tongue JR, Epps HR, Forese LL. Instructional course lecture. Communication skills for patient-centered care. Research-based, easily learned techniques for medical interviews that benefit orthopaedic surgeons and their patients. *J Bone Joint Surg Am.* 2004;86:652.
- 44. Knee dislocations are devastating injuries that typically require multiple ligament reconstruction. Which of the following factors is the most important in optimizing functional outcome?**
- use of allograft tissue rather than autograft tissue
 - use of the tibial inlay method of posterior cruciate ligament reconstruction
 - early operative intervention**
 - delaying surgery until a maximum range of motion is achieved
 - postoperative rehabilitation protocol
- Montgomery SC, Miller MD. Specialty update. What's new in sports medicine. *J Bone Joint Surg Am.* 2004;86:686.
- 45. When compared with radiation levels from the large c-arm device, radiation levels from the miniature c-arm have been shown to be more than:**
- 15% less at comparable distances
 - 25% less at comparable distances
 - 50% less at comparable distances
 - 75% less at comparable distances
 - 95% less at comparable distances**
- Badman BL, Rill L, Butkovich B, Arreola M, Vander Griend RA. Radiation exposure with use of the mini-c-arm for routine orthopaedic imaging procedures. *J Bone Joint Surg Am.* 2004;86:13.
- 46. Radiographic assessment of displacement of greater tuberosity fractures of the shoulder can be difficult. When four surgeons were asked to assess which view best determined the magnitude of greater tuberosity displacement, they reached the greatest consensus on a decision to perform open reduction and internal fixation after requiring:**
- a true anteroposterior radiograph of the scapula in internal rotation

- B. a true anteroposterior radiograph of the scapula in external rotation
 C. an axillary view
 D. an outlet view
 E. **all four views**

Parsons BO, Klepps SJ, Miller S, Bird J, Gladstone J, Flatow E. Reliability and reproducibility of radiographs of greater tuberosity displacement. A cadaveric study. J Bone Joint Surg Am. 2004;86:58.

- 47. In a study of patients with traumatic anterior dislocation that compared immobilization of the shoulder in internal rotation with immobilization in external rotation, 30% of the shoulders subsequently dislocated after being immobilized in internal rotation. What was the rate of recurrent dislocation of the shoulders immobilized in external rotation?**

- A. 10%
 B. 20%
 C. 30%
 D. 40%
 E. 50%

Gartsman GM, Hasan SS. Specialty update. What's new in shoulder and elbow surgery. J Bone Joint Surg Am. 2004;86:226.

- 48. When a young patient with "cam-type" femoroacetabular impingement is treated with surgical resection of the head-neck junction, how much bone can be safely resected without significantly weakening the femoral neck?**

- A. 5% of the neck diameter
 B. 10% of the neck diameter
 C. **30% of the neck diameter**
 D. 50% of the neck diameter
 E. 75% of the neck diameter

Mardones RM, Gonzalez C, Chen Q, Zobitz M, Kaufman KR, Trousdale RT. Surgical treatment of femoroacetabular impingement: evaluation of the effect of the size of the resection. J Bone Joint Surg Am. 2004;86:273.

- 49. In a rabbit model, the greatest reduction in both the prevalence and the severity of heterotopic ossification was observed when preoperative irradiation of the hip was performed:**

- A. three weeks before the operation
 B. within forty-eight hours before the operation
 C. **twenty-four hours before the operation**
 D. seventy-two hours before the operation
 E. at any time before the operation; the specific timing of the irradiation was not important

Rumi MN, Deol GS, Bergandi JA, Singapuri KP, Pellegrini VD Jr. Optimal timing of preoperative radiation for prophylaxis

against heterotopic ossification. A rabbit hip model. J Bone Joint Surg Am. 2004;86:366.

- 50. In a comparison of computed tomography and plain radiography for the assessment of periacetabular osteolysis following total hip arthroplasty, it was found that computed tomography has:**

- A. an average relative error of volume measurements of 63.4%
 B. a detection rate that is the same as that of plain radiography
 C. a 100% detection rate
 D. **a better detection rate than plain radiography**
 E. a worse detection rate than multiple plain radiographic views

Leung S, Naudie D, Kitamura N, Walde T, Engh CA. Computed tomography in the assessment of periacetabular osteolysis. J Bone Joint Surg Am. 2004;86:592.

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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