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Continuing Medical Education

CME

Review Questions

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July, August, September  
2001

1. **Which of the following conditions best predicts postoperative pulmonary dysfunction in patients with femoral fracture treated with intramedullary nailing?**
- extensive reaming of the femoral canal
  - associated pulmonary contusion
  - associated chronic obstructive pulmonary disease
  - alveolar dead space of >0.2 (20%)**
  - extensive smoking history
- Brent L. Norris, W. Christopher Patton, Joseph N. Rudd, Colleen M. Schmitt, and Jeffrey A. Kline.** Pulmonary Dysfunction in Patients with Femoral Shaft Fracture Treated with Intramedullary Nailing. *J Bone Joint Surg Am.* 2001;83:1162-1168.
2. **When performing an oblique sliding osteotomy of the fifth metatarsal to eliminate symptoms from a bunionette, the distal fragment should be displaced:**
- medially or medially and inferiorly**
  - laterally or laterally and inferiorly
  - superiorly with a medial shift
  - superiorly with a lateral shift
  - proximally only
- Manjunath Koti and Nicola Maffulli.** Bunionette. *J Bone Joint Surg Am.* 2001;83:1076-1082.
3. **Approximately what percentage of patients who have been treated with arthroscopically assisted anterior cruciate ligament reconstruction of the knee and have a stable knee will have degenerative arthritic changes visible radiographically with follow-up of greater than six years?**
- 0
  - 10**
  - 20
  - 30
  - 40
- Daniel B. O'Neill.** Arthroscopically Assisted Reconstruction of the Anterior Cruciate Ligament: A Follow-up Report. *J Bone Joint Surg Am.* 2001;83:1329-1332.
4. **Preoperative planning (approach, length of the prosthesis, thickness of the prosthesis, and extent of a femoral osteotomy) is most important for successful femoral revision with a revision stem with diaphyseal fixation. What is the most important information necessary for preoperative planning of a femoral revision without cement?**
- the amount of shortening of the affected lower extremity compared with that of the contralateral limb
  - the preoperative stability of the greater trochanter
  - whether the loosened stem had cemented or cementless fixation
  - the most proximal part of the femur at which stable fixation of the prosthesis is possible**
  - the amount of anterior bow of the femur
- Paul Böhm and Oliver Bischel.** Femoral Revision with the Wagner SL Revision Stem: Evaluation of One Hundred and Twenty-nine Revisions Followed for a Mean of 4.8 Years. *J Bone Joint Surg Am.* 2001;83:1023-1031.
5. **In patients undergoing total knee replacement with cement, the use of a tourniquet during the procedure:**
- does not reduce the total blood loss**
  - does not reduce the amount of intraoperative blood loss
  - leads to coagulopathic problems
  - results in a higher prevalence of peripheral nerve palsies
  - results in a shorter operative time
- AM Tetro and JF Rudan.** Tourniquet Use During Total Knee Arthroplasty Did Not Reduce Total Blood Loss: Tetro AM, Rudan JF. The effects of a pneumatic tourniquet on blood loss in total knee arthroplasty. *Can J Surg.* 2001 Feb;44:33-8. *J Bone Joint Surg Am.* 2001;83:1282.
6. **Posterior cruciate ligament-retaining total knee arthroplasty in patients with rheumatoid arthritis yields satisfactory results at the time of intermediate-term follow-up (mean, 10.5 years). The most common reason for revision is:**
- aseptic loosening
  - posterior instability
  - failure of a metal-backed patellar component**
  - excessive wear between the tibial insert and its tray
  - fracture about either the femoral or the tibial component
- Michael J. Archibeck, Richard A. Berger, Regina M. Barden, Joshua J. Jacobs, Mitchell B. Sheinkop, Aaron G. Rosenberg, and Jorge O. Galante.** Posterior Cruciate Ligament-Retaining Total Knee Arthroplasty in Patients with Rheumatoid Arthritis. *J Bone Joint Surg Am.* 2001;83:1231-1236.
7. **Long-standing varus deformity of the elbow can lead to tardy posterolateral instability of the elbow. This is due to:**
- repetitive traumatic dislocations and/or subluxations of the elbow
  - a violent force causing the elbow to dislocate posteriorly
  - chronic lateral overpull on the olecranon and varus of the radius
  - hypoplasia of the medial epicondyle and medial trochlea of the humerus
  - a shift of the mechanical axis of the elbow that produces repetitive external rotation torque**
- Shawn W. O'Driscoll, Robert J. Spinner, Michael D. McKee, W. Ben Kibler, Hill Hastings, II, Bernard F. Morrey, Hiroyuki Kato, Shinichiro Takayama, Junya Imatani, Satoshi Toh, and H. Kerr Graham.** Tardy Posterolateral Rotatory Instability of the Elbow due to Cubitus Varus. *J Bone Joint Surg Am.* 2001;83:1358-1369.
8. **Recent clinical and basic research shows that oral glucosamine taken by patients with osteoarthritis of the knee:**
- decreases joint pain as compared with placebo, but the mechanism of this effect remains unknown**
  - decreases joint pain as compared with a placebo and oral analgesics, but the mechanism

- of this effect remains unknown
- C. decreases joint pain as compared with a placebo by decreasing inflammation in synovial tissue
  - D. increases the synthesis of proteoglycans in articular cartilage but has less effect on joint pain than oral analgesics
  - E. decreases the degradation of proteoglycans in articular cartilage but has less effect on joint pain than oral analgesics

**Joseph A. Buckwalter, John J. Callaghan, and Randy N. Rosier.** From Oranges and Lemons to Glucosamine and Chondroitin Sulfate: Clinical Observations Stimulate Basic Research. *J Bone Joint Surg Am.* 2001;83:1266-1268.

**9. What is the most important factor in predicting the progression of diabetic neuropathy?**

- A. presence or absence of vascular disease
- B. glucose control**
- C. type of diabetes
- D. age of the patient
- E. duration of the diabetes

**Gregory P. Guyton and Charles L. Saltzman.** The Diabetic Foot: Basic Mechanisms of Disease. *J Bone Joint Surg Am.* 2001;83:1083-1096.

**10. Nonoperative treatment of displaced fractures of the medial epicondyle in children with a long arm cast:**

- A. frequently results in nonunion of the fragment but has long-term outcomes comparable with those of internal fixation**
- B. results in union of the fragment in the majority of children but has long-term outcomes that are poorer than those of internal fixation
- C. results in cubitus valgus due to overgrowth of the medial side of the distal humeral growth plate
- D. provides long-term functional results that are inferior to those of surgical excision of the fragment with ligament repair
- E. results in a high prevalence of union of the fragment but usually produces unacceptable elbow joint stiffness

**P. Farsetti, V. Potenza, R. Caterini, and E. Ippolito.** Long-Term Results of Treatment of Fractures of the Medial Humeral Epicondyle in Children. *J Bone Joint Surg Am.* 2001;83:1299-1305.

**11. Computed tomography and intraoperative fluoroscopy appear to be equally accurate in assessing for possible joint penetration by a periacetabular screw used in fixation of a fracture. However, an important disadvantage of computed tomography with use of a 4-mm slice thickness at 3-mm intervals is that:**

- A. it is less sensitive, with an increased risk that an unnecessary reoperation will be performed
- B. it is less sensitive, with an increased risk that joint penetration will be missed
- C. it is less specific, with an increased risk that an unnecessary reoperation will be performed**
- D. it is less specific, with an increased risk that joint penetration will be missed
- E. it is difficult to obtain in every patient

**David B. Carmack, Berton R. Moed, Kathleen McCarroll, and David Freccero.** Accuracy of Detecting Screw Penetration of the Acetabulum with Intraoperative Fluoroscopy and Computed Tomography. *J Bone Joint Surg Am.* 2001;83:1370-1375.

**12. Total knee arthroplasty for posttraumatic degenerative arthritis following open reduction and internal fixation of tibial plateau fractures is associated with:**

- A. an increased prevalence of postoperative periprosthetic fractures
- B. an increased prevalence of intraoperative fractures of the tibia
- C. an increased prevalence of late failure due to loosening of the tibial component
- D. an increased prevalence of rupture of the extensor mechanism during surgery**
- E. decreased functional status and quality of life as compared with those following arthroplasty for primary osteoarthritis of the knee

**Khaled J. Saleh, Pamela Sherman, Pam Katkin, Russell Windsor, Stephen Haas, Richard Laskin, and Thomas Sculco.** Total Knee Arthroplasty After Open Reduction and Internal Fixation of Fractures of the Tibial Plateau: A Minimum Five-Year Follow-up Study. *J Bone Joint Surg Am.* 2001;83:1144-1148.

**13. A diabetic patient with limited joint mobility in the fingers may be at increased risk for ulcerations in the forefoot because:**

- A. the skin of the foot is atrophic in patients with limited joint mobility
- B. sensory neuropathy is always more profound in patients with limited joint mobility
- C. limited finger motion can be associated with Achilles contractures and limited hindfoot motion**
- D. limited joint mobility is a sign of vascular disease
- E. limited joint mobility implies sympathetic dysfunction and problems with perspiration

**Gregory P. Guyton and Charles L. Saltzman.** The Diabetic Foot: Basic Mechanisms of Disease. *J Bone Joint Surg Am.* 2001;83:1083-1096.

**14. Which of the following regarding glenoid labral cysts is true?**

- A. glenoid labral cysts are the most common cause of neuropathy
- B. an underlying glenoid tear is present in a minority of patients
- C. image-guided aspiration therapy may relieve nerve compression symptoms but not those from shoulder instability**
- D. since nerve compression is present, a course of conservative therapy is contraindicated
- E. infraspinatus muscle atrophy is a relative contraindication to image-guided aspiration therapy

**Carl S. Winalski, Mark I. Robbins, Stuart G. Silverman, and John A.K. Davies.** Interactive Magnetic Resonance Image-Guided Aspiration Therapy of a Glenoid Labral Cyst: A Case Report. *J Bone Joint Surg Am.* 2001;83:1237-1242.

**15. In long-term (more than ten-year) follow-up studies of Porous Coated Anatomic (PCA)**

**total hip replacements, the most important variable influencing the need for revision surgery was:**

- A. size of the prosthetic femoral head
- B. gender of the patient
- C. **thickness of the polyethylene liner**
- D. age of the patient at the time of the initial surgery
- E. cause of the arthritis that led to the initial arthroplasty

Haruo Kawamura, Michael J. Dunbar, Paraic Murray, Robert B. Bourne, and Cecil H. Rorabeck. The Porous Coated Anatomic Total Hip Replacement: A Ten to Fourteen-Year Follow-up Study of a Cementless Total Hip Arthroplasty. *J Bone Joint Surg Am.* 2001;83:1333-1338.

**16. While most fractures of bone heal, some do not heal because of unknown causes. In the future, products will be available that stimulate cells in the fracture to form cartilage and bone, thus leading to healing. Which of the following factors has been shown to accelerate fracture-healing or induce healing in nonunions?**

- A. superficial zone proteins
- B. **bone morphogenetic proteins**
- C. hyaluronic acid
- D. proteoglycans
- E. type-X collagen

Linda J. Sandell and Matthew J. Silva. What's New in Orthopaedic Research. *J Bone Joint Surg Am.* 2001;83:1117-1124.

**17. Which of the following proteins is a target for therapies designed to inhibit loosening of total joint components?**

- A. transforming growth factor-beta (TGF- $\beta$ )
- B. **tumor necrosis factor-alpha (TNF- $\alpha$ )**
- C. insulin-like growth factor-1 (IGF-1)
- D. vascular endothelial growth factor (VEGF)
- E. fibroblast growth factor (FGF)

Paul F. Pollice, Randy N. Rosier, R. John Looney, J. Edward Puzas, Edward M. Schwarz, and Regis J. O'Keefe. Oral Pentoxifylline Inhibits Release of Tumor Necrosis Factor-Alpha from Human Peripheral Blood Monocytes: A Potential Treatment for Aseptic Loosening of Total Joint Components. *J Bone Joint Surg Am.* 2001;83:1057-1061.

**18. Following total knee arthroplasty, patients with ankylosing spondylitis are more likely to have which of the following acute complications?**

- A. pulmonary complications
- B. deep infection
- C. instability of the patella
- D. deep venous thrombosis
- E. **heterotopic ossification**

Javad Parvizi, Gavan P. Duffy, and Robert T. Trousdale. Total Knee Arthroplasty in Patients with Ankylosing Spondylitis. *J Bone Joint Surg Am.* 2001;83:1312-1316

**19. Which of the following most accurately describes the characteristic deformity of a malunited dorsally displaced (Colles) fracture?**

- A. loss of volar tilt, loss of length relative to the

ulna, and pronation of the distal fragment

- B. **loss of volar tilt, loss of length relative to the ulna, and supination of the distal fragment**
- C. increase in volar tilt, loss of length relative to the ulna, and increase in ulnar inclination of the distal fragment articular surface
- D. loss of volar tilt, increase in length relative to the ulna, and neutral rotation of the distal fragment
- E. dorsal displacement, increase in ulnar inclination, and dorsal intercalary segment instability of the carpus

Jesse B. Jupiter and Diego L. Fernandez. Complications Following Distal Radial Fractures. *J Bone Joint Surg Am.* 2001;83:1244-1265.

**20. A recent study of Internet use among academic orthopaedic departments in the United States revealed that:**

- A. academic departments are maximizing their use of the Internet
- B. interdepartmental exchange of information through the Internet is common
- C. information supplied by individual departments on the Internet is easily accessible
- D. **<50% of the departments use the Internet for patient education or to provide information on clinical services**
- E. information posted on the Internet is up-to-date

Tamara D. Rozental, Jess H. Lonner, and Selene G. Parekh. The Internet as a Communication Tool for Academic Orthopaedic Surgery Departments in the United States. *J Bone Joint Surg Am.* 2001;83:987-991.

**21. After disruption of the acromioclavicular ligaments, the most important structure(s) that prevents posterior translation of the clavicle is (are):**

- A. the meniscal ligaments in the acromioclavicular joint
- B. the coracoacromial ligaments
- C. the conoid ligament
- D. **the trapezoid ligament**
- E. the coracoclavicular fascia

Richard E. Debski, I. M. Parsons, Savio L-Y. Woo, and Freddie H. Fu. Effect of Capsular Injury on Acromioclavicular Joint Mechanics. *J Bone Joint Surg Am.* 2001;83:1344-1351.

**22. Operative treatment of the "floating shoulder" (that is, fracture of the neck of the glenoid combined with fracture of the clavicle or an unstable separation of the acromioclavicular joint) has been shown to improve what functional parameter?**

- A. **the range of forward elevation of the shoulder**
- B. internal rotation strength when normalized for hand dominance
- C. external rotation strength when normalized for hand dominance
- D. overall patient satisfaction as measured on the Short Form-36
- E. the range of lateral abduction of the shoulder

Kenneth A. Egol, Patrick M. Connor, Madhav A. Karunakar,

Stephen H. Sims, Michael J. Bosse, and James F. Kellam. The Floating Shoulder: Clinical and Functional Results. *J Bone Joint Surg Am.* 2001;83:1188-1194.

**23. The occurrence of anterior knee pain following total knee arthroplasty is most likely related to:**

- A. the severity of preoperative anterior knee pain
- B. the degree of chondromalacia of the patella
- C. the surgical technique**
- D. whether or not the patient is morbidly obese
- E. whether or not the patella was resurfaced

Robert L. Barrack, Alexander J. Bertot, Michael W. Wolfe, Douglas A. Waldman, Matko Milicic, and Leann Myers. Patellar Resurfacing in Total Knee Arthroplasty: A Prospective, Randomized, Double-Blind Study with Five to Seven Years of Follow-up. *J Bone Joint Surg Am.* 2001;83:1376-1381.

**24. Bilateral concomitant rupture of the patellar tendon is most commonly associated with:**

- A. patient age of less than twenty years
- B. patient age of more than sixty-five years
- C. chronic overuse in jumping sports
- D. chronic systemic disease**
- E. an underlying genetic deficiency in type-I collagen

Peter S. Rose and Frank J. Frassica. Atraumatic Bilateral Patellar Tendon Rupture: A Case Report and Review of the Literature. *J Bone Joint Surg Am.* 2001;83:1382-1386.

**25. Which of the following best describes the three major conditions of the distal radioulnar joint following distal radial fracture that are responsible for pain and/or limited forearm rotation?**

- A. incongruity, nonunion of the ulnar styloid, and instability
- B. incongruity, palmar capsule contracture, and nonunion of the ulnar styloid
- C. incongruity, instability, and ulnocarpal impaction**
- D. instability, palmar capsule contracture, and incongruity
- E. instability, angulation of the ulna, and incongruity

Jesse B. Jupiter and Diego L. Fernandez. Complications Following Distal Radial Fractures. *J Bone Joint Surg Am.* 2001;83:1244-1265.

**26. The ratio between the mean percentage of patients who present to their primary care physician with a chief complaint related to the musculoskeletal system and the mean percentage of the curriculum that Canadian medical schools devote to musculoskeletal education is approximately:**

- A. 9:1**
- B. 4:1
- C. 1:1
- D. 1:4
- E. 1:9

S.J. Pinney and W.D. Regan. Educating Medical Students About Musculoskeletal Problems: Are Community Needs Reflected in the Curricula of Canadian Medical Schools? *J Bone Joint Surg Am.* 2001;83:1317-1320.

**27. The use of an interactive patient-education video program for patients with low-back disorders:**

- A. improves postoperative outcomes

- B. positively affects patient satisfaction
- C. is no better than printed material in explaining disease processes
- D. makes it less likely that the patient will choose surgical treatment**
- E. is too expensive to justify widespread implementation

RA Deyo, DC Cherkin, J Weinstein, J Howe, M Ciol, and AG Mulley. Use of an Interactive Video Program Lowered Surgery Rates Among Patients with Herniated Discs and Was as Effective as an Educational Booklet with Regard to Back Pain Outcomes: Deyo RA, Cherkin DC, Weinstein J, Howe J, Ciol M, Mulley AG Jr. Involving patients in clinical decisions: impact of an interactive video program on use of back surgery. *Med Care.* 2000 Sep;38:959-69. *J Bone Joint Surg Am.* 2001;83:1283.

**28. Which of the following factors is predictive of the final functional result of a total hip arthroplasty performed for the treatment of an ankylosed hip?**

- A. duration of fusion
- B. type of fusion
- C. initial diagnosis
- D. number of previous operations
- E. status of the gluteal muscles**

Moussa Hamadouche, Luc Kerboull, Alain Meunier, Jean Pierre Courpied, and Marcel Kerboull. Total Hip Arthroplasty for the Treatment of Ankylosed Hips: A Five to Twenty-one-Year Follow-up Study. *J Bone Joint Surg Am.* 2001;83:992-998.

**29. Which of the following structures is most likely responsible for blocking closed reduction of an isolated dislocation of the cuboid?**

- A. bifurcate ligaments
- B. peroneus brevis tendon
- C. base of the fifth metatarsal
- D. peroneus longus tendon**
- E. cuboid-calcaneal joint capsule

Matthew B. Dobbs, Haemish Crawford, and Charles Saltzman. Peroneus Longus Tendon Obstructing Reduction of Cuboid Dislocation: A Report of Two Cases. *J Bone Joint Surg Am.* 2001;83:1387-1391.

**30. Which of the following best describes the radiographic growth of the cervical vertebral bodies?**

- A. rapid during the first five years of life and then slower until maturity**
- B. rapid during the first ten years of life and then slower until maturity
- C. linear throughout growth
- D. slow during the first five years of life and then rapid until maturity
- E. maximum between ages ten and twelve in girls and between ages twelve and fourteen in boys

Jeffrey C. Wang, Stephen L. Nuccion, John E. Feighan, Brad Cohen, Frederick J. Dorey, and Peter V. Scoles. Growth and Development of the Pediatric Cervical Spine Documented Radiographically. *J Bone Joint Surg Am.* 2001;83:1212-1218.

**31. Measuring patients' expectations of knee surgery can guide patient education and enhance shared decision-making. Which of the following regarding patients' expectations is**

most true?

- A. patients' expectations of knee surgery are independent of diagnosis
- B. patients' expectations of knee surgery are independent of functional status
- C. **patient-derived surveys provide a means to identify possibly unattainable expectations**
- D. psychosocial expectations are not major considerations for patients undergoing knee surgery
- E. patients' expectations of knee surgery do not have a role in postoperative assessment

Carol A. Mancuso, Thomas P. Sculco, Thomas L. Wickiewicz, Edward C. Jones, Laura Robbins, Russell F. Warren, and Pamela Williams-Russo. Patients' Expectations of Knee Surgery. *J Bone Joint Surg Am.* 2001;83:1005-1012.

32. Compression of the humeral head into the glenoid labral concavity keeps the humeral head centered. The stability ratio is defined as the force that resists subluxational translation divided by the applied compressive force. This force is lowest in which direction:

- A. superior
- B. **anterior**
- C. inferior
- D. anterior-superior
- E. anterior-inferior

A.M. Halder, S.G. Kuhl, M.E. Zobitz, D. Larson, and K.N. An. Effects of the Glenoid Labrum and Glenohumeral Abduction on Stability of the Shoulder Joint Through Concavity-Compression: An *in Vitro* Study. *J Bone Joint Surg Am.* 2001;83:1062-1069.

33. Which of the following magnetic resonance imaging abnormalities in asymptomatic individuals are most closely associated with the development of low-back or leg pain with long-term follow-up (more than seven years)?

- A. spinal stenosis and disc herniation
- B. disc herniation and disc bulging
- C. spinal stenosis and disc degeneration
- D. **disc herniation and disc degeneration**
- E. disc bulging and spinal stenosis

David G. Borenstein, James W. O'Mara, Scott D. Boden, William C. Lauerman, Alan Jacobson, Craig Platenberg, Dieter Schellinger, and Sam W. Wiesel. The Value of Magnetic Resonance Imaging of the Lumbar Spine to Predict Low-Back Pain in Asymptomatic Subjects: A Seven-Year Follow-up Study. *J Bone Joint Surg Am.* 2001;83:1306-1311.

34. Which of the following was the most common radiographic abnormality following arthroplasty with a metallic radial head for a radial head fracture that was too comminuted to internally fix?

- A. marginal osteophytes
- B. joint space narrowing
- C. **capitellar osteopenia**
- D. heterotopic bone formation
- E. subchondral sclerosis

Jaydeep K. Moro, Joel Werier, Joy C. MacDermid, Stuart D. Patterson, and Graham J.W. King. Arthroplasty with a Metal Radial Head for Unreconstructible Fractures of the Radial Head. *J Bone Joint Surg Am.* 2001;83:1201-1211.

35. A sixty-year-old woman with a complete tenth thoracic spinal cord injury of twenty years' duration sustains a lumbar compression fracture. The etiology of the compression fracture is most likely related to:

- A. the spinal cord injury
- B. **other factors unrelated to the spinal cord injury**
- C. the age of the patient
- D. the duration of the spinal cord injury
- E. the combination of C and D

Douglas E. Garland, Rodney H. Adkins, Charles A. Stewart, Roy Ashford, and Daniel Vigil. Regional Osteoporosis in Women Who Have a Complete Spinal Cord Injury. *J Bone Joint Surg Am.* 2001;83:1195-1200.

36. Stenosis of the gluteal arteries is a rare cause of claudication-type groin pain because:

- A. the arteries are not affected by atherosclerosis
- B. **there is ample pelvic collateral circulation**
- C. the arteries are not damaged in hip surgery
- D. claudication pain involving the abductor muscles is not referred to the groin
- E. postsurgical scarring cannot affect the gluteal arterial circulation

Jonathan Herald, Samuel Macclessi, and George Kirsh. An Unusual Cause of Groin Pain Following Hip Replacement: A Case Report. *J Bone Joint Surg Am.* 2001;83:1392-1395.

37. Which is the most frequently encountered clinically important complication of the Swanson silicone trapezium implant?

- A. infection at the site of the prosthesis
- B. breakage of the prosthesis
- C. **dislocation**
- D. silicone-induced synovitis
- E. nerve palsy

Henk G.J. van Cappelle, Robert Deutman, and Jim R. van Horn. Use of the Swanson Silicone Trapezium Implant for Treatment of Primary Osteoarthritis: Long-Term Results. *J Bone Joint Surg Am.* 2001;83:999-1004.

38. Which of the following statements concerning osteonecrosis of the femoral head is most true?

- A. it is a disease state that is easy to model
- B. osteogenic protein-1 is definitely useful for patients with osteonecrosis
- C. free iliac crest bone graft is the most reliable graft for treatment of femoral head defects
- D. the dog is not a suitable model for studying femoral head defects
- E. **the healing response of femoral head defects can be mimicked in a canine model**

Michael A. Mont, Lynne C. Jones, John J. Elias, Nozomu Inoue, Taek-Rim Yoon, Edmund Y.S. Chao, and David S. Hungerford. Strut-Autografting with and without Osteogenic Protein-1: A Preliminary Study of a Canine Femoral Head Defect Model. *J Bone Joint Surg Am.* 2001;83:1013-1022.

39. All of the following have been associated with increased perioperative mortality following total knee arthroplasty EXCEPT:

- A. simultaneous bilateral total knee arthroplasty
- B. age greater than seventy years
- C. use of a cemented prosthesis
- D. **revision surgery**

- E. preexisting cardiovascular disease

Javad Parvizi, Thomas A. Sullivan, Robert T. Trousdale, and David G. Lewallen. Thirty-Day Mortality After Total Knee Arthroplasty. *J Bone Joint Surg Am.* 2001;83:1157-1161.

40. At which knee flexion angles does internal rotation result in less posterior laxity than external rotation in knees in which the posterior cruciate and meniscofemoral ligaments have been cut?

- A. 60° and 90°  
B. 30° and 90°  
C. 0° and 30°  
D. 30° and 60°  
E. 0° and 90°

John A. Bergfeld, David R. McAllister, Richard D. Parker, Antonio D. C. Valdevit, and Helen Kambic. The Effects of Tibial Rotation on Posterior Translation in Knees in Which the Posterior Cruciate Ligament Has Been Cut. *J Bone Joint Surg Am.* 2001;83:1339-1343.

41. Pharmaceutical companies often purchase physicians' prescribing patterns from local pharmacies. This practice raises several ethical issues because:

- A. patients' names are supplied with the data  
B. the data can be used to influence physicians' prescribing patterns  
C. the physicians receive no reimbursement for the data  
D. patients are contacted to discuss the data  
E. the data are posted on pharmaceutical web sites

James D. Capozzi and Rosamond Rhodes. Prescriber Profiles. *J Bone Joint Surg Am.* 2001;83:1115-1116.

42. In patients with ipsilateral scapular neck and mid-shaft clavicular fractures, the glenoid fragment is not floating unless there is concomitant disruption of which ligaments?

- A. coracohumeral and acromioclavicular  
B. coracohumeral and coracoacromial  
C. coracoacromial and acromioclavicular  
D. coracoacromial and acromioclavicular  
E. coracoacromial and sternoclavicular

Gerald R. Williams, John Naranja, John Klimkiewicz, Andrew Karduna, Joseph P. Iannotti, and Matthew Ramsey. The Floating Shoulder: A Biomechanical Basis for Classification and Management. *J Bone Joint Surg Am.* 2001;83:1182-1187.

43. The treatment of mixed tumor arising in bone should be:

- A. curettage  
B. curettage and adjuvant radiation therapy  
C. curettage and a surgical adjuvant (phenol, cryosurgery)  
D. resection  
E. amputation

Richard L. McGough, Li Juan Wang, Douglas R. Gnepp, and Richard M. Terek. Metastatic Mixed Tumor Arising in Bone: A Case Report and Review of the Literature. *J Bone Joint Surg Am.* 2001;83:1396-1402.

44. The recommended operative treatment for a varus aligned knee with posterolateral ligament deficiency and a prior failed anterior

cruciate ligament reconstruction is:

- A. high tibial osteotomy  
B. high tibial osteotomy and anterior cruciate ligament reconstruction simultaneously  
C. high tibial osteotomy followed by anterior cruciate ligament and posterolateral ligament reconstruction  
D. high tibial osteotomy and anterior cruciate ligament and posterolateral ligament reconstruction simultaneously  
E. anterior cruciate ligament and posterolateral ligament reconstruction followed by high tibial osteotomy

Frank R. Noyes and Sue D. Barber-Westin. Revision Anterior Cruciate Surgery with Use of Bone-Patellar Tendon-Bone Autogenous Grafts. *J Bone Joint Surg Am.* 2001;83:1131-1143.

45. Which of the following factors is a major determinant causing muscle cells to differentiate toward an osteogenic lineage, which consequently improves bone-healing?

- A. size of the defect  
B. location of the defect  
C. osteogenic stimuli (BMP-2)  
D. scaffold (Helistat)  
E. time postinjury

Joon Yung Lee, Douglas Musgrave, Dalip Pelinkovic, Kazumasa Fukushima, James Cummins, Arvydas Usas, Paul Robbins, Freddie H. Fu, and Johnny Huard. Effect of Bone Morphogenetic Protein-2-Expressing Muscle-Derived Cells on Healing of Critical-Sized Bone Defects in Mice. *J Bone Joint Surg Am.* 2001;83:1032-1039.

46. In the preoperative discussion about postoperative expectations following interdigital neuroma excision, a patient should be apprised of the fact that:

- A. a variable sensory deficit may occur in the web space or digits  
B. a plantar approach is the preferable exposure for resection of the primary neuroma  
C. results following neuroma excision deteriorate with time  
D. a patient should be able to wear a shoe of choice postoperatively  
E. residual interspace tenderness is an indication for reexploration for recurrent neuroma

Michael J. Coughlin and Troy Pinsonneault. Operative Treatment of Interdigital Neuroma: A Long-Term Follow-up Study. *J Bone Joint Surg Am.* 2001;83:1321-1328.

47. Extrusion of polymethylmethacrylate into the spinal canal or the neural foramen may complicate vertebroplasty for osteoporotic compression fractures. Which of the following precautions is unlikely to be helpful in preventing this complication?

- A. adding tungsten or tantalum to the cement to enhance intraoperative fluoroscopic visualization  
B. injecting polymethylmethacrylate in small volume through both pedicles  
C. injecting polymethylmethacrylate in a viscous

- partially polymerized consistency
- D. using biplanar fluoroscopy or computed tomography for visualization

**E. waiting until six weeks after the acute fracture to allow early bone consolidation**

Kevin D. Harrington. Major Neurological Complications Following Percutaneous Vertebroplasty with Polymethylmethacrylate: A Case Report. *J Bone Joint Surg Am.* 2001;83:1070-1073.

- 48. When conducting outcome studies of total knee arthroplasty, it is essential to collect data on preoperative status. Some study designs, such as cross-sectional and retrospective, do not allow for the collection of preoperative data and may rely on patient recall of preoperative status. Certain sociodemographic and clinical features have been shown to influence patient recall. Which of the following factors has been shown to NOT influence patient recall?**

- A. age  
B. mental health status  
C. **gender**  
D. educational status  
E. postoperative deterioration of function

Elizabeth A. Lingard, Elizabeth A. Wright, and Clement B. Sledge. Pitfalls of Using Patient Recall to Derive Preoperative Status in Outcome Studies of Total Knee Arthroplasty. *J Bone Joint Surg Am.* 2001;83:1149-1156.

- 49. Mixed tumor arising in bone can be differentiated from chondrosarcoma by:**

- A. S-100 staining  
B. **squamous metaplasia**  
C. intraosseous location  
D. myxoid stroma  
E. chondroid stroma

Richard L. McGough, Li Juan Wang, Douglas R. Gnepp, and Richard M. Terek. Metastatic Mixed Tumor Arising in Bone: A Case Report and Review of the Literature. *J Bone Joint Surg Am.* 2001;83:1396-1402.

- 50. The most specific method to diagnose muscle injuries is:**

- A. patient history  
B. physical examination  
C. **magnetic resonance imaging**  
D. ultrasound  
E. computed tomography

Greg R. Van den Berghe, James F. Queenan, and Duane A. Murphy. Isolated Rupture of the Brachialis: A Case Report. *J Bone Joint Surg Am.* 2001;83:1074-1075.

**BONUS QUESTION (optional)**

- 51. The Journal of Bone and Joint Surgery was founded by the American Orthopaedic Association in:**

- A. 1903  
B. 1913  
C. 1923  
D. 1933  
E. 1943

**ANSWER KEY**

Correct answers are blacked out.

- |                      |                      |                             |
|----------------------|----------------------|-----------------------------|
| 1. A B C <b>D</b> E  | 18. A B C D <b>E</b> | 35. A <b>B</b> C D E        |
| 2. <b>A</b> B C D E  | 19. A <b>B</b> C D E | 36. A <b>B</b> C D E        |
| 3. A <b>B</b> C D E  | 20. A B C <b>D</b> E | 37. A B <b>C</b> D E        |
| 4. A B C <b>D</b> E  | 21. A B C <b>D</b> E | 38. A B <b>C</b> D <b>E</b> |
| 5. <b>A</b> B C D E  | 22. <b>A</b> B C D E | 39. A B C <b>D</b> E        |
| 6. A B <b>C</b> D E  | 23. A B <b>C</b> D E | 40. <b>A</b> B C D E        |
| 7. A B C D <b>E</b>  | 24. A B C <b>D</b> E | 41. A <b>B</b> C D E        |
| 8. <b>A</b> B C D E  | 25. A B <b>C</b> D E | 42. A B <b>C</b> D E        |
| 9. A <b>B</b> C D E  | 26. <b>A</b> B C D E | 43. A B C <b>D</b> E        |
| 10. <b>A</b> B C D E | 27. A B <b>C</b> D E | 44. A B <b>C</b> D E        |
| 11. A B <b>C</b> D E | 28. A B C D <b>E</b> | 45. A B <b>C</b> D E        |
| 12. A B C <b>D</b> E | 29. A B C <b>D</b> E | 46. <b>A</b> B C D E        |
| 13. A B <b>C</b> D E | 30. <b>A</b> B C D E | 47. A B C D <b>E</b>        |
| 14. A B <b>C</b> D E | 31. A B <b>C</b> D E | 48. A B <b>C</b> D E        |
| 15. A B <b>C</b> D E | 32. A <b>B</b> C D E | 49. A <b>B</b> C D E        |
| 16. A <b>B</b> C D E | 33. A B C <b>D</b> E | 50. A B <b>C</b> D E        |
| 17. A <b>B</b> C D E | 34. A B <b>C</b> D E | 51. <b>A</b> B C D E        |

**ACCREDITATION STATEMENT**

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**QUESTIONS?**

Please contact the CME Division of *The Journal of Bone and Joint Surgery* at 781 449 9780 x143.