
THE JOURNAL OF BONE & JOINT SURGERY

CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

APRIL, MAY, JUNE
2005

THIS CME EXAM IS ALSO AVAILABLE AT JBJS.ORG AS AN
INTERACTIVE ONLINE EXAM OR AS A DOWNLOADABLE PDF FILE.
RECEIVE YOUR RESULTS IMMEDIATELY WHEN YOU
TAKE THE ONLINE VERSION FOR CREDIT OR PRACTICE.

THE DEADLINE TO SUBMIT YOUR ANSWERS FOR GRADING THIS SET OF QUESTIONS IS OCTOBER 15, 2005.

PURPOSE

The purposes of this CME program are:

- To provide the general orthopaedic surgeon with an ability to assess his or her continuing competence in orthopaedics through the acquisition of contemporary scientific information.
- To provide a broad-based review and update of the major subspecialty areas in orthopaedics.
- To make *The Journal* reader aware of new advances in orthopaedic surgical techniques and technology.

INSTRUCTIONS

In order to benefit most from this educational experience and qualify for Continuing Medical Education credit, please observe the following instructions:

1. Read the learning objectives listed on the Response Form and be certain that they meet your individual learning needs.
2. These CME questions have been derived from the information presented in the April, May, and June issues of the American volume of *The Journal of Bone and Joint Surgery* (Volume 87-A, Numbers 4, 5, and 6). A careful study of each article should yield the best response to each question.
3. Read each question carefully, identify the best answer, and record that answer on the CME Response Form in the back of this document.
4. To receive CME credit, it is absolutely essential that you complete all portions of the attached Response Form and answer each question.
5. In order for the American Academy of Orthopaedic Surgeons to document your participation in the CME activity, Academy Fellows must provide their AAOS membership number in the designated area on the Response Form.
6. In addition to providing the answers to the CME questions, you must complete the examination evaluation questions. These questions are found on the Response Form. The way you answer these evaluation questions will not in any way affect the score that you achieve.
7. All completed answer sheets will be graded, and you will be advised of the results of this examination within four weeks after it is received. In order to qualify for CME credit, a score of more than 50% correct must be achieved on the examination. A charge of \$30 per quarter, or \$110 per year, must be paid at the time that the answer sheet is submitted. **The deadline to submit your answers for grading this set of questions is October 15, 2005.**

1. As part of efforts to contain health-care costs, various initiatives have been tried to reduce the length of the hospital stay following orthopaedic procedures. For patients who have been determined to be fit to undergo total hip arthroplasty, which of the following factors is most strongly associated with the likelihood of early discharge from the hospital:

- A. gender
- B. body mass index
- C. American Society of Anesthesiologists grade
- D. age
- E. use of a minimal-incision technique

2. Intermittent exposure to parathyroid hormone produces which of the following effects:

- A. bone resorption
- B. bone formation
- C. hypercalcemia
- D. hypercalciuria
- E. heterotopic ossification

3. Preoperative administration of tranexamic acid reduces postoperative blood loss following cementless total hip arthroplasty. The major effect with regard to reducing blood loss, compared with that in controls, was observed up to:

- A. one hour postoperatively
- B. four hours postoperatively
- C. six hours postoperatively
- D. twelve hours postoperatively
- E. twenty-four hours postoperatively

4. It is now widely accepted that self-report outcomes instruments intended for use across cultures:

- A. must reflect the cultural nuances of the culture in which the original instrument was constructed
- B. must not only be translated well linguistically, but also must be adapted culturally to maintain their content validity
- C. must be translated verbatim into the language of the target culture
- D. must have fewer items to be properly understood in the target culture
- E. must be administered only to bilingual patients

5. All of the following are associated with a significantly increased risk of deep infection in patients with an orthopaedic oncological condition except:

- A. radiation therapy
- B. pediatric extendable prostheses
- C. chemotherapy
- D. pelvic prostheses
- E. revision surgery

- 6. A patient with recurrent posterior instability of the shoulder is likely to have a history of all of the following except:**
- posterior dislocation of the shoulder
 - multidirectional instability of the shoulder
 - family history of joint hyperlaxity
 - generalized ligament laxity
 - instability of other joints
- 7. Removable cast walkers overwrapped with a roll of fiberglass were used in place of conventional total contact casts for insensate diabetic foot ulcers. The investigators observed all of the following except:**
- the cast walkers were quicker to apply
 - the cast walkers resulted in more complications
 - the cast walkers were as effective as the total contact casts
 - healing time was equal
 - the cast walkers were cost-effective
- 8. One month after total knee arthroplasty, patients had a profound loss of quadriceps strength. The main reason(s) for this weakness was found to be:**
- knee pain
 - failure of voluntary activation
 - atrophy
 - effusion
 - B and C
- 9. All of the following statements are true except:**
- generation of particulate wear debris is inevitable during the normal use of a prosthetic joint
 - periprosthetic pseudomembranes usually contain macrophages, fibroblasts, foreign-body giant cells, and numerous wear debris particles
 - debris-associated inflammation and bone resorption contribute to the loosening process of a prosthetic joint
 - therapy targeted to periprosthetic pseudomembranes could be a potential approach to halting the loosening process
 - gene therapy is readily available to treat patients with signs of aseptic loosening
- 10. For the diagnosis of meniscal tears of the knee, which clinical test was shown to have accuracy comparable with that of magnetic resonance imaging?**
- the Apley compression and distraction test
 - the McMurray test
 - the medial and lateral joint-line tenderness test
 - the Thessaly test at 20° of knee flexion
 - the Thessaly test at 5° of knee flexion
- 11. It is impractical to isolate the toes during forefoot surgery. Which of the following techniques results in the greatest reduction in positive cultures of specimens obtained from the hallucal nail fold?**
- alcohol scrub and paint with use of bristles for the scrub
 - povidone-iodine scrub and paint with use of sponges for the scrub
 - alcohol prewash with sponges along with povidone-iodine scrub and paint
 - povidone-iodine scrub and paint with use of bristles for the scrub
 - single-step povidone-iodine paint
- 12. A group of orthopaedic surgeons who invest in an orthopaedic surgery specialty hospital are likely to experience:**
- an increase in both patient volume and surgical volume
 - a decrease in patient volume but an increase in surgical volume
 - an increase in patient volume but a decrease in surgical volume
 - no change in patient volume but an increase in surgical volume
 - no change in either patient volume or surgical volume
- 13. Among 125,000 Medicare recipients who underwent unilateral primary total knee arthroplasty in 2000, the prevalence of complications in the first ninety days was <1% for all of the following except:**
- pneumonia
 - pulmonary embolus
 - myocardial infarction
 - deep wound infection
 - death
- 14. Cost-utility analysis is:**
- an economic analysis that assesses the value of an intervention in terms of improving both quality and quantity of life
 - an economic analysis that requires placement of a monetary value on human life
 - an economic analysis that does not take into account individuals' preferences for health
 - an economic analysis that only examines the costs of interventions and does not address the health benefits
 - not a useful tool in health technology evaluation
- 15. Extracorporeal shock wave therapy used to treat chronic lateral epicondylitis resulted in significant improvement in all of the following outcome end points except:**
- pain scores
 - scores on an upper-extremity functional scale
 - patient activity scores

- D. grip strength
E. overall impression of disease state
- 16. Which of the following proteins is the most important in initiating Type-I (death-inducing signaling complex) pathway of Fas-mediated apoptosis in human lumbar disc cells?**
- A. caspase-8
B. caspase-9
C. caspase-3
D. cytochrome-c
E. BID (BH3 interacting domain death agonist)
- 17. One late complication noted after treatment of a soft-tissue sarcoma with adjuvant external beam radiation is a postradiation fracture. Which of the following is associated with a higher risk for the development of this complication?**
- A. male gender
B. an age of more than forty years
C. high-dose radiation (≥ 60 Gy)
D. malignant fibrous histiocytoma
E. $>30\%$ periosteal stripping during the tumor resection
- 18. In the treatment of a pertrochanteric type-A1.1 or A2.1 fracture in an osteoporotic patient, which of the following procedures was shown to provide good fixation with minimal blood loss and no need for blood transfusion?**
- A. intramedullary rod
B. dynamic hip screw
C. external fixation with titanium-coated pins
D. external fixation with hydroxyapatite-coated pins
E. blade-plate
- 19. Posterior glenoid bone loss (glenoid retroversion) can be seen in patients with glenohumeral arthritis. The best method to address this problem is:**
- A. performing a standard total shoulder arthroplasty and leaving the glenoid retroverted
B. performing a hemiarthroplasty and leaving the glenoid retroverted
C. performing a total shoulder arthroplasty or hemiarthroplasty and anteverting the humeral component
D. performing a total shoulder arthroplasty and building up the posterior defect with polymethylmethacrylate
E. performing a total shoulder arthroplasty and restoring a neutral glenoid surface by reaming the high anterior side, bone-grafting the posterior defect, or using a custom glenoid implant
- 20. In a study of patients with osteosarcoma who underwent modular endoprosthetic reconstruction, which of the following factors had the greatest effect on knee proprioception?**
- A. the range of motion of the knee
B. the length of resection of the bone
C. the testing angles of the knee
D. the prosthesis used
E. the type of tumor
- 21. A review of 121 ankle fractures treated with open reduction and internal fixation revealed that 21% of the patients were symptomatic as a result of a surgical injury to which nerve?**
- A. sural
B. saphenous
C. superficial peroneal
D. deep peroneal
E. posterior tibial
- 22. In expert hands, fluoroscopically guided extraforaminal cervical nerve root blocks were found to be associated with a:**
- A. 1% to 2% risk of transient minor complications
B. 1% to 2% risk of infection
C. 1% to 2% risk of vertebral artery laceration or thrombosis
D. 1% to 2% risk of quadriplegia
E. 0.5% to 1% risk of death
- 23. Hip arthroscopy can be performed with the patient in either the supine or the lateral decubitus position. An advantage of the lateral position is that:**
- A. fluoroscopy is seldom needed
B. the femoral head requires no distraction
C. most aspects of the joint can be visualized through the anterior and superior paratrochanteric portals
D. no special distraction equipment is needed
E. muscle relaxation is not required
- 24. A study of various surgical preparation solutions for foot and ankle surgery demonstrated that:**
- A. the combination of chlorhexidine and alcohol was the most effective solution for eliminating bacteria from the foot
B. the combination of chlorhexidine and alcohol was the most effective solution for decreasing infection rates following foot and ankle surgery
C. chloroxynol was the most effective solution for decreasing infection rates following foot and ankle surgery
D. Staphylococcus epidermidis is a common skin bacteria that never causes infection
E. chloroxynol was the most effective solution for eliminating bacteria from the foot
- 25. Which of the following is correct with regard to the anatomy of the long thoracic nerve?**
- A. in the supraclavicular region, the long tho-

- racic nerve runs perpendicular to the brachial plexus
- the upper division of the long thoracic nerve is formed by the union of branches stemming from the C5 and C6 roots. The upper division presents a trajectory parallel to the brachial plexus
 - the union of the upper and lower divisions of the long thoracic nerve occurs in the vicinity of the brachial plexus roots
 - the long thoracic nerve is formed by branches stemming from the C3 and C4 roots
 - the upper division of the long thoracic nerve is responsible for scapular retraction and stabilization
- 26. When patients undergoing anterior lumbar arthrodesis were treated with rhBMP-2 and structural cortical allograft, their radiographs demonstrated accelerated interbody healing that was:**
- not associated with an improved return-to-work status at twenty-four months
 - associated with improvement in all clinical end points studied
 - associated with improvement in Oswestry Disability Index scores at twenty-four months only
 - not associated with improved clinical outcomes
 - similar to the radiographic findings in the control group of patients (treated with autograft)
- 27. Biomechanical studies have shown that the tibial inlay technique of posterior cruciate ligament reconstruction is superior to the tibial tunnel technique with regard to:**
- ease of graft implantation
 - avoidance of graft abrasion
 - faster postoperative rehabilitation
 - fewer intraoperative complications
 - superior functional results
- 28. In a study of patients with articular cartilage degeneration associated with postcollapse osteonecrosis in the femoral head, which of the following statements was found to be most correct?**
- the mechanical properties of articular cartilage are degraded in advanced radiographic stages of the disease
 - cartilage in the late stages of osteonecrosis may maintain mechanical properties even after collapse of the articular surface
 - the gross appearance of the articular surface is a poor indicator of the mechanical properties of the cartilage
 - the success of head-sparing procedures in patients with osteonecrosis is unrelated to the radiographic stage of the disease
 - cartilage in the late stages of osteonecrosis rarely shows signs of degeneration
- 29. A twenty-six-year-old carpenter being seen for a first-time evaluation reports a six-month history of chronic shoulder pain and weakness. Physical examination demonstrates grade-3 weakness isolated to resisted external rotation with mild atrophy of the infraspinatus muscle. He also has mild tenderness in the subacromial region and mild pain with impingement signs, but the results of the examination are otherwise normal. You perform an office-based ultrasound examination, which shows a small partial rotator cuff tear. Radiographs show a normal coracoacromial arch. The next diagnostic study that you would recommend is:**
- examination under anesthesia with diagnostic arthroscopy
 - impingement test with 10 mL of lidocaine
 - magnetic resonance imaging of the shoulder with intra-articular gadolinium
 - double-contrast arthrogram
 - cervical magnetic resonance imaging
- 30. A finger with an unstable ununited fracture and a permanent sensory loss distal to the fracture is best treated with:**
- open reduction and internal fixation
 - open reduction and internal fixation with autogenous bone graft
 - arthrodesis
 - electrical stimulation
 - amputation
- 31. Radiographic evidence of glenohumeral arthritis develops in approximately what percentage of patients following open repair of an isolated subscapularis tendon tear?**
- 0%
 - 10%
 - 30%
 - 50%
 - 90%
- 32. In patients with metal-on-metal bearing hip prostheses:**
- serum cobalt and chromium ion levels are unaffected by patient activity
 - the majority of cobalt and chromium is excreted in sweat
 - the majority of cobalt and chromium is excreted in stool
 - serum cobalt and chromium levels tend to rise over time
 - serum cobalt and chromium levels are independent of renal function
- 33. Following the diagnosis of deep periprosthetic infection in a patient who was treated for an orthopaedic oncological condition, which treatment yields the best functional outcome and probability of eradicating the infection?**

- A. one-stage revision
 B. antibiotics alone
 C. Girdlestone excision arthroplasty
 D. two-stage revision
 E. surgical débridement and insertion of gentamicin beads
- 34. You are the physician covering your high-school home opening football game in Atlanta, Georgia, over the Labor Day weekend. You notice that one of the young linemen is rubbing his leg and trying to stretch out his calf muscles and hamstrings as if he is experiencing cramping. He gets up slowly after the next play and appears a little confused. He did not receive any direct hits. You should:**
- A. have the player come off the field, evaluate him, take his temperature, remove his helmet, have him drink cold fluids, and have him sit in a cool place while loosening his clothing and applying ice to his skin
 B. ask the coach to have the player's friend enter the game so that his friend can assess the player's status on the field
 C. not think too much about the incident as this is the first year that this youngster has played with the team and you would expect him to be confused
 D. have the player come off the field immediately and transport him to the nearest medical center for a measurement of his blood glucose level
 E. have the player come off the field and breathe oxygen until his confusion resolves
- 35. A diagnosis of pigmented villonodular synovitis of the hip can be made with magnetic resonance imaging. Which of the following findings is least consistent with this diagnosis?**
- A. intra-articular effusion
 B. low signal intensity on both T1 and T2-weighted images
 C. synovial hyperplasia
 D. bone erosions
 E. a diminished width of the joint space
- 36. Which of the following factors decreases the likelihood of success of bracing for an adolescent with idiopathic scoliosis?**
- A. higher Risser score
 B. older age
 C. overweight habitus
 D. increased number of hours of brace wear per day
 E. increased percent curve correction in the brace
- 37. Acetabular chondral injuries are graded according to severity, and they influence surgical outcome. These lesions most often:**
- A. occur in the posterior aspect of the acetabulum as a result of posterior dislocation
 B. are symptomatic
 C. occur only in patients with moderated dysplasia
 D. occur in the anterior aspect of the joint in association with a labral tear
 E. are easily detected by magnetic resonance imaging
- 38. Nonoperative management of a displaced intra-articular calcaneal fracture may result in a symptomatic malunion. Which of the following factors has the most substantial biomechanical impact on ankle joint function?**
- A. residual lateral wall expansion and subfibular impingement
 B. residual subtalar joint incongruity
 C. osseous overhang at the calcaneocuboid joint
 D. loss of calcaneal height
 E. varus hindfoot malalignment
- 39. Eradication of bacteria is most difficult in which region of the foot?**
- A. heel pad
 B. web spaces between the toes
 C. nail folds
 D. anterior aspect of the ankle
 E. dorsal aspect of the midfoot
- 40. At a minimum of ten years following unicompartmental knee arthroplasty, the most frequent cause of failure was found to be:**
- A. unexplained pain
 B. degeneration of the opposite compartment
 C. tibial loosening
 D. polyethylene wear
 E. patellofemoral degeneration
- 41. After treatment of a distal tibial metaphyseal fracture with an intramedullary nail, which of the following is most predictive of a poorer outcome as determined by the Musculoskeletal Function Assessment Outcomes Instrument?**
- A. time to fracture-healing
 B. intra-articular extension of the fracture
 C. age
 D. presence of an open fracture
 E. gender
- 42. A retrieval study of failed patellar components following total knee arthroplasty showed that the magnitude of surface damage to the polyethylene was increased in the presence of all of the following except:**
- A. a component that had been in vivo for more than two years
 B. a metal-backed component
 C. a dome-shaped patellar component

- D. an asymmetric femoral component
E. valgus malalignment of the femoral component
- 43. A review of the results of surgery to release severe elbow contractures of the elbow demonstrated that:**
- A. the results are so poor that patients should be cautioned against surgery
B. surgery is worthwhile only in patients with heterotopic ossification
C. surgery is effective with or without hinged external fixation
D. surgery is effective only when used with hinged external fixation
E. surgery is effective only with postoperative radiation therapy
- 44. In a cadaveric study of glenohumeral stability, joint translations in normal, unaltered shoulders were found to be:**
- A. similar to those following anterior capsular tightening
B. greater than those following anterior capsular tightening
C. similar to those following an anterior-inferior capsular shift
D. less than those following an anterior-inferior capsular shift
E. greater than those following an anterior-inferior capsular shift
- 45. Which of the following meniscal allograft-preservation techniques has been shown to be associated with the worst results in the medium and long term?**
- A. viable meniscal allograft preservation
B. cryopreservation
C. deep-freezing and irradiation of allografts
D. fresh allografts
E. flash-freezing of allografts
- 46. Which of the following five locations in a modular acetabular liner that has been gamma-sterilized in air is the most susceptible to in vivo oxidation?**
- A. worn bearing surface
B. worn backside surface
C. unworn backside surface
D. rim
E. locking mechanism
- 47. The goal of a valgus, extension proximal femoral osteotomy in the Ilizarov hip reconstruction for treatment of the sequelae of infantile hip infection is to:**
- A. lengthen the leg
B. improve hip biomechanics
C. increase the range of motion of the hip
D. decrease hip pain
E. achieve a hip arthrodesis
- 48. Skin grafts may be used at the time of amputation in children to achieve soft-tissue coverage of the residual limb. Such grafts perform best when they:**
- A. cover >50% of the residual limb
B. cover <25% of the residual limb
C. are applied to a residual limb that is end-bearing
D. are applied directly over exposed bone
E. are located on the distal aspect of the residual limb
- 49. After a distraction plate was used to treat fractures of the distal part of the radius associated with comminution extending into the diaphysis, which of the following was associated with loss of wrist motion at the time of final follow-up?**
- A. duration of internal fixation across the wrist joint
B. a more proximal extent of the comminution into the diaphysis
C. open fracture
D. increased DASH score
E. both B and D
- 50. Interscalene regional anesthesia for shoulder surgery was found to be associated with which of the following?**
- A. prolonged operating room ("turnover") time
B. a >5% rate of block failure
C. a high rate of major cardiac or neurologic complications
D. a higher failure rate with longer surgical procedures
E. transient neuropathy
- Conflict of Interest**
The author of these CME questions does not have any financial conflict of interest with regard to the subject matter discussed in these review questions.

RESPONSE FORM

EXAMINATION EVALUATION

Did the July 2005 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of foot and ankle surgery and pediatric orthopaedics? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of shoulder and hand trauma? Yes No
3. Make you aware of new advances in orthopaedic surgical techniques and technology? Yes No

Comments (please comment on the quality of the questions and their relationship to your practice): _____

*Note: These objectives will change every quarter.

SURVEY (optional)

1. Which of the following best describes your practice type?
 - General orthopaedics
 - General orthopaedics with subspecialty interest
 - Exclusively subspecialty
 - Resident or student
 - Researcher
 - Other: _____
2. What are your specialty interests? Please rank in order of importance (1 = highest importance).

___ Adult	___ Spine
___ Geriatric	___ Hand
___ Pediatric	___ Rheumatology
___ Rehabilitation	___ Foot and Ankle
___ Sports	___ Other: _____
___ Trauma	
3. Which is your number-one priority to read when you receive *The Journal* (American volume only) each month?
 - Commercial advertising
 - Current Concepts
 - Classified advertising
 - Letters to The Editor
 - Clinical scientific articles
 - Basic scientific articles
 - Orthopaedic Forum
 - Instructional Course Lectures

ACCREDITATION STATEMENT

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the American Academy of Orthopaedic Surgeons (AAOS) and *The Journal of Bone and Joint Surgery* (JBJS). The AAOS is accredited by the ACCME to provide continuing medical education for physicians. The AAOS designates this educational activity for up to 10 hours of category-1 credit toward the AMA Physicians' Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

The deadline to submit your answers for grading this set of questions is October 15, 2005.

QUESTIONS?

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

ANSWER KEY

Black out the correct answers

- | | | |
|---------------|---------------|-----------------------------------|
| 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 | CME Credits Claimed* _____ |

*Required. Please enter the number of CME credit hours you are claiming for this exam. You must complete this field to receive CME credit.

AAOS Member Number _____
(Without this number, the AAOS will not track your CME credits.)

Last Name _____ First Name _____ Degree _____

Mailing Address _____

State _____ Zip Code _____

Phone Number _____

Fax Number _____ E-mail Address (optional) _____

PAYMENT OPTIONS

Payment must accompany the CME Response Form.

Mail to: CME Division, The Journal of Bone and Joint Surgery, 20 Pickering Street, Needham, MA 02492

Subscription (4 quarterly exams) \$110.00
Single exam \$30.00

Please check one:

- Check/money order made payable to *The Journal of Bone and Joint Surgery* (drawn on a U.S. bank or U.S. bank draft only)
- Mastercard Visa AMEX

Account number: _____

Expiration date: ____ / ____

Name as it appears on card: _____

I authorize my credit card to be charged \$ _____ for this activity.

Signature _____