
THE JOURNAL OF BONE & JOINT SURGERY
CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

JANUARY, FEBRUARY, MARCH
2004

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THE DEADLINE TO SUBMIT YOUR ANSWERS FOR GRADING THIS SET OF QUESTIONS IS JULY 15, 2004.

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 January, February, and March issues of the American volume of *The Journal of Bone and Joint Surgery* (Volume 86-A, Numbers 1, 2, and 3). 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 July 15, 2004.**

1. **Which of the following is associated with the poorest functional outcome following scapulothoracic dissociation (closed forequarter amputation)?**
 - A. injury mechanism
 - B. injury severity score (ISS)
 - C. associated vascular injury to the subclavian or axillary vessels
 - D. associated complete brachial plexus avulsion
 - E. degree of scapular lateralization on the initial anteroposterior chest radiograph
2. **Which of the following clinical parameters is NOT associated with the likelihood that a nonanemic patient undergoing total hip arthroplasty will require a perioperative transfusion?**
 - A. preoperative hemoglobin level of >110 g/L
 - B. patient older than seventy-five years
 - C. male gender
 - D. hypertension
 - E. body mass index of <27
3. **When a previously asymptomatic patient presents with lower-extremity swelling four years following total hip arthroplasty, the differential diagnosis should include all but which of the following:**
 - A. deep-vein thrombosis
 - B. infection
 - C. compression of iliac vessels secondary to an intrapelvic cyst
 - D. osteolysis
 - E. occult lymphedema
4. **Published studies have shown a wide range in the prevalence of dysphonia and dysphagia after anterior cervical spine surgery. The highest prevalence of the complications has been found in studies with which of the following characteristics?**
 - A. sample size of less than fifty patients
 - B. patient assessment outcomes instruments
 - C. surgery assessment outcomes instruments
 - D. use of an anterior cervical plate
 - E. multilevel procedures
5. **Which of the following factors was found to be the most important in decreasing the rate of loosening and polyethylene wear in patients undergoing total hip arthroplasty for developmental dysplasia?**
 - A. lateralization of the hip center
 - B. use of an acetabular allograft
 - C. medialization of the hip center
 - D. use of a cemented cup and stem
 - E. cup inclination angle of >45°
6. **In a study of patients who elected to undergo surgery for a chronic rotator cuff tear, the presence of comorbidities had a significant negative impact on their self-reported:**

- A. alcohol use
B. employability
C. preoperative function
D. surgical outcome
E. postoperative pain
- 7. After insertion of a total elbow prosthesis into a patient with rheumatoid arthritis, paresthesias in the distribution of the ulnar nerve are significantly associated with:**
- A. duration of the disease
B. age of the patient
C. previous ulnar symptoms
D. operative technique
E. position of the upper extremity during the operation
- 8. Long-term steroid use by boys with Duchenne muscular dystrophy is associated with:**
- A. a high prevalence of osteonecrosis
B. multiple long-bone fractures
C. attenuation of the development of scoliosis
D. muscle hypertrophy
E. need for ophthalmologic surgery for cataracts
- 9. The craniovertebral region is one of the most mobile segments of the spine. Which of the following is true with respect to this articulation?**
- A. the normal total range of flexion-extension is approximately 35°
B. odontoidectomy produces a significant change in axial rotation
C. the normal range of axial rotation is approximately 80°
D. screw fixation does not substantially stabilize the C0-C2 segment
E. the normal range of unilateral bending is approximately 30°
- 10. The sensitivity of a diagnostic test refers to:**
- A. the probability of having the condition given a positive test
B. the probability of a positive test in patients with the condition
C. the probability of not having the condition given a negative test
D. the probability of a negative test in patients without the condition
E. the probability of a positive test in patients without the condition
- 11. Assessment of the outcomes of total knee arthroplasty with a mail survey is subject to response bias. In a recent survey, patients who failed to respond were:**
- A. non-English readers
B. in chronic care facilities
C. out of state
D. ethnically diverse
E. patients with lower general health scores
- 12. Some patients with chronic disabling work-related musculoskeletal disorders persist in seeking new health-care services, even after tertiary rehabilitation. The clinical implication of this finding is:**
- A. such a subgroup cannot be effectively treated
B. tertiary rehabilitation is not effective
C. early identification of this subgroup can prevent overutilization of services
D. health-care overutilization is a major problem with no known solution
E. underutilization can be as problematic as overutilization in the treatment of such patients
- 13. Surgeons may encounter blue, green, or black discoloration of cortical bone during orthopaedic operations. Which of the following medications is most likely to cause this discoloration?**
- A. isotretinoin
B. sulfamethoxazole
C. levofloxacin
D. minocycline
E. amoxicillin
- 14. In a long-term follow-up study that compared the durabilities of cementless and cemented acetabular components, which of the following was more prevalent when a cementless component had been used?**
- A. acetabular component loosening
B. acetabular component polyethylene wear
C. dislocation
D. infection
E. femoral component loosening
- 15. Strength of the repair and resistance to tendon motion are two factors that the surgeon should consider when deciding when to initiate mobilization after flexor tendon repair. What conclusion can be drawn regarding the time to initiate tendon motion on the basis of a dog model in which this was studied?**
- A. begin motion on day 1, since immobilization results in steadily increasing gliding resistance and decreasing repair strength
B. begin motion on postoperative day 3, which offers the best combination of high repair strength and low gliding resistance
C. begin motion on postoperative day 5, which offers the best combination of high repair strength and low gliding resistance
D. begin motion at one to two weeks, since gliding resistance decreases and repair strength increases over time
E. there is no ideal time, as every starting point represents a compromise between increasing repair strength and increasing gliding resistance
- 16. Postoperative cerebrospinal fluid leak following anterior cervical spine surgery may be associated with:**

- A. cardiovascular collapse
- B. subarachnoid hemorrhage
- C. brain herniation
- D. electrolyte abnormality
- E. acute airway obstruction

17. When compared with the results of primary total knee arthroplasty, total knee arthroplasty after a previous proximal tibial osteotomy was found to be followed by a higher prevalence of:

- A. infection
- B. stiffness
- C. radiographic loosening
- D. avulsion of the patellar ligament insertion
- E. patellar fracture

18. In a recent prospective study of the Insall-Burstein II posterior stabilized knee prosthesis, which of the following was found after a mean duration of follow-up of seven years?

- A. high rate of femoral component loosening
- B. high rate of tibial component loosening
- C. rate of tibial osteolysis of 25%
- D. high rate of instability
- E. low rate of loosening and tibial osteolysis

19. Compared with the uninjured elbow, what are the most prevalent findings in the elbow of a patient who had a Mason type-II or III fracture of the radial head or neck more than fifteen years ago?

- A. reduced joint space
- B. more pain in the elbow
- C. degenerative changes with cysts, irregular subchondral bone, and osteophytes
- D. decreased range of motion
- E. positive Tinel sign

20. The p value refers to:

- A. the chance of the study demonstrating a significant association when, in reality, there is no significant association
- B. the chance of the study demonstrating no significant association when, in reality, there is a significant association
- C. the strength of the association between two variables
- D. the power of the study to demonstrate valid findings
- E. the chance of the study demonstrating a significant association when, in reality, there is a significant association

21. Which factor is most predictive of recurrence following correction of a clubfoot deformity with the Ponseti method?

- A. clinical severity of initial deformity
- B. noncompliance with bracing
- C. family income
- D. marital status of parents
- E. gender of patient

22. The subclavius tendon reconstruction for sternoclavicular joint instability (Burrows technique):

- A. reconstructs the costoclavicular ligament with use of the subclavius tendon
- B. maintains the insertion of the clavicle and passes the rib origin around the first rib
- C. requires drill holes in the manubrium
- D. is a dependable choice because the subclavius tendon is always of adequate length
- E. requires resection of the medial aspect of the clavicle

23. An ultrasound follow-up study of arthroscopically repaired large rotator cuff tears revealed that the prevalence of recurrent tears was:

- A. <20%
- B. 40%
- C. 60%
- D. >80%
- E. 0%

24. Following the withdrawal of short-term post-operative immunosuppression, vascularized physal allografts in rabbits demonstrated:

- A. increased growth compared with that of the control physis that was not operated on
- B. growth arrest
- C. continued viability only if epiphyseal and metaphyseal circulation had been restored with osseous union
- D. continued viability only if epiphyseal but not metaphyseal circulation had been restored with osseous union
- E. continued viability only if metaphyseal but not epiphyseal circulation had been restored with osseous union

25. Which of the following statements is true regarding proprioception after total knee arthroplasty?

- A. proprioception cannot be restored because the articular mechanoreceptors are lost
- B. increased pain receptor activity enhances awareness of joint position
- C. sensory denervation after total knee arthroplasty causes a reduction in proprioception
- D. proprioception improves after total knee arthroplasty because laxity and inflammation are reduced
- E. mechanoreceptors repopulate capsuloligamentous tissue and improve proprioception

26. When the ceramic head of a total hip prosthesis is scratched on a metal surface, the scratched area of the head may become black. What is the source of the black discoloration?

- A. damage to the surface polishing of the ceramic head
- B. bloody joint fluid coating the ceramic head
- C. phase transformation of the ceramic

- D. metallic debris transfer from the metal surface
E. fissuring of the ceramic
- 27. When a diaphyseal fitting stem is used in revision total hip arthroplasty, which of the following factors is most highly associated with the likelihood of an intraoperative femoral fracture?**
- A. surgical approach
B. preoperative bone loss
C. previously cemented femoral stem
D. use of a bowed stem
E. female gender
- 28. The presence of scoliosis in a patient with known polyostotic fibrous dysplasia is most likely:**
- A. if there is a midline café-au-lait skin lesion in the midthoracic area
B. if the patient reports a history of back pain without lower-extremity pain
C. if a lesion of fibrous dysplasia is seen on a radiograph of the pelvis
D. if a blood serum IGF-1 level establishes the diagnosis of acromegaly
E. if a bone scan demonstrates a lesion consistent with fibrous dysplasia in the thoracic spine
- 29. Elevation of the humeral head center during total shoulder arthroplasty may impair shoulder function by which of the following mechanisms?**
- A. subacromial impingement
B. inferior dislocation on abduction
C. aseptic loosening of the humeral component
D. reduction of abduction torque
E. increase of the lever arms of the rotator cuff
- 30. Which of the following grafts are now considered to be the gold standard for anterior cruciate ligament reconstruction?**
- A. hamstring graft only
B. bone-patellar tendon-bone graft only
C. both hamstring and bone-patellar tendon-bone grafts
D. quadriceps graft only
E. allograft only
- 31. The benefits of increased femoral offset include all of the following EXCEPT:**
- A. improved abductor muscle function
B. lower joint reaction forces
C. adequate soft-tissue tension without limb-lengthening
D. reduced polyethylene wear
E. lower femoral loosening rates
- 32. The most important variable affecting the initial stability of a cemented femoral stem that is tapered in the coronal plane was found to be:**
- A. thickness of the cement mantle
B. presence of a collar
C. presence of a distal centralizer
D. stem size
E. stem surface finish
- 33. Following anterior cruciate ligament reconstruction with a four-stranded semitendinosus-gracilis graft, follow-up lateral knee radiographs revealed:**
- A. tibial tunnel contraction and femoral tunnel expansion
B. tibial tunnel expansion and femoral tunnel contraction
C. tibial tunnel expansion and femoral tunnel not visible
D. tibial tunnel expansion and femoral tunnel expansion
E. no change in either the tibial or the femoral tunnel
- 34. The lifetime risk of sustaining a traumatic fracture by the age of sixty-five years is higher than the lifetime risk for all but which of the following?**
- A. stroke
B. major depression
C. coronary artery disease
D. breast cancer
E. type-II diabetes mellitus
- 35. In patients with cirrhosis of the liver who underwent total knee arthroplasty, the most common postoperative complication was:**
- A. wound dehiscence
B. stroke
C. delirium tremens
D. edema
E. infection
- 36. As assessed by magnetic resonance imaging or plain roentgenography, disc degeneration in competitive athletes is:**
- A. present in >95% of participants
B. found more frequently than in nonathletes
C. found less frequently than in nonathletes
D. not related to the type or intensity of the sports activity
E. a rare finding
- 37. A comparison of the Lapidus and Hohmann procedures for correction of hallux valgus deformity shows:**
- A. a higher rate of nonunion after the Hohmann procedure
B. superior clinical results of the Lapidus procedure when hypermobility of the first tarsometatarsal joint existed preoperatively
C. equal clinical results
D. more radiographic shortening after the Lapidus procedure
E. better reduction of pain after the Hohmann procedure

- 38. Which of the following patient characteristics has been shown to correlate with a reduced therapeutic effect after the intra-articular injection of hyaluronic acid in a patient with degenerative arthritis of the knee?**
- younger age (less than sixty-five years old)
 - advanced osteoarthritis with complete loss of joint space
 - male gender
 - socioeconomic status
 - activity level
- 39. In patients with a clubfoot and a congenitally absent posterior tibial artery, what is the dominant arterial supply to the foot?**
- anterior tibial artery
 - medial plantar artery
 - peroneal artery
 - lateral plantar artery
 - dorsalis pedis artery
- 40. Which four hand and wrist conditions have the highest prevalence among patients referred for orthopaedic services?**
- fracture, thoracic outlet syndrome, tendinitis/tenosynovitis, and ganglion/synovial cyst
 - fracture, carpal tunnel syndrome, osteoarthritis, and ganglion/synovial cyst
 - fracture, carpal tunnel syndrome, tendinitis/tenosynovitis, and nail disorders
 - fracture, carpal tunnel syndrome, tendinitis/tenosynovitis, and ganglion/synovial cyst
 - fracture, sprain, carpal tunnel syndrome, and tendinitis/tenosynovitis
- 41. What may be the clinical relevance of metaphyseal radiolucent changes observed in patients with Legg-Calvé-Perthes disease?**
- no relevance
 - the end of the fragmentation stage
 - associated with a growth disturbance of the proximal femoral physis
 - associated with a prolonged disease course
 - signifies a need for a pelvic or femoral osteotomy
- 42. Which motion has been shown to decrease with time following débridement arthroplasty for primary osteoarthritis of the elbow?**
- extension
 - flexion
 - flexion-extension range of motion
 - pronation
 - supination
- 43. When compared with patients of normal stature who undergo total hip arthroplasty, patients of small stature were more likely to sustain which of the following complications?**
- postoperative infection
 - deep-vein thrombosis
 - dislocation
 - periprosthetic fracture
 - wound hematoma
- 44. In a recent study, the most frequent long-term complication of acetabular revision with a porous-coated component and multiple screw fixation was:**
- polyethylene wear
 - infection
 - limb-length discrepancy
 - dislocation
 - component loosening
- 45. Several methods are currently being used to treat articular defects. Which of the following procedures produces its effects through a mechanism other than marrow stimulation?**
- microfracture
 - drilling
 - mosaicplasty
 - abrasion
 - débridement
- 46. Which of the following factors is associated with an increased risk of loosening of the tibial implant after unicompartmental knee arthroplasty?**
- increased posterior slope of the tibial implant
 - absence of the anterior cruciate ligament at the time of implantation
 - an intact but partially degenerated anterior cruciate ligament at the time of implantation
 - the position of the femoral implant on the lateral radiograph
 - the weight of the patient
- 47. The tension in the plantar fascia has been found to correlate with the force carried by the Achilles tendon. During which stage of the gait cycle would you expect the greatest tension to be present in the plantar fascia?**
- heel-strike
 - swing
 - toe-off
 - late stance
 - midstance
- 48. After traumatic elbow dislocation, which of the following is least likely to be entrapped in the ulnohumeral joint?**
- osteochondral fragment
 - radial nerve
 - lateral triceps
 - median nerve
 - brachial artery
- 49. In an Asian population undergoing total knee arthroplasty, which of the following statements is true:**
- low-molecular-weight heparin and indometha-

- cin significantly reduced the prevalence of deep-vein thrombosis
- B. the prevalence of postoperative deep-vein thrombosis was <30% in untreated patients
 - C. the majority of patients with venographically proven deep-vein thrombosis were symptomatic
 - D. postoperative venography found the majority of deep-vein thromboses to be present proximal to the knee
 - E. the prevalence of venographically proven preoperative deep-vein thrombosis was <1%

50. Rectus femoris tendon transfer is performed in patients with cerebral palsy to improve knee flexion during walking. Data from magnetic resonance imaging suggest that the im-

provements in knee flexion after surgery are most likely due to which of the following?

- A. an angular deviation in the rectus femoris muscle path after surgery
- B. reduction of the knee extension moment generated by the rectus femoris
- C. scar tissue constraining the motion of the rectus femoris
- D. increased knee flexion moment due to conversion of the rectus femoris to a knee flexor
- E. selection of transfer site

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 April 2004 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of shoulder surgery, sports medicine, and hand surgery? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of shoulder surgery, sports medicine, and hand surgery? 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 July 15, 2004.

QUESTIONS?

Please contact the CME Division of *The Journal of Bone and Joint Surgery* at 781-449-9780 x124.

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 |
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| 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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