
The Journal of Bone & Joint Surgery
Continuing Medical Education

CME

Review Questions

July, August, September
2003

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 July, August, and September issues of the American volume of *The Journal of Bone and Joint Surgery* (Volume 85-A, Numbers 7, 8, and 9). 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 \$25 per quarter, or \$95 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 January 15, 2004.**

1. Placement of an antegrade intramedullary nail through the tip of the greater trochanter in children has been associated with which of the following complications?

- A. coxa vara with femoral neck narrowing
- B. coxa valga with femoral neck narrowing
- C. osteonecrosis of the femoral head
- D. limb-length discrepancy due to physeal arrest
- E. avulsion of the abductor with persistent limp

2. Which is the most common location of bone hydatidosis?

- A. spine
- B. pelvis and hip
- C. femur
- D. ribs
- E. tibia

3. The posterior branch of the axillary nerve divides from the anterior branch:

- A. medial to the origin of the long head of the triceps muscle
- B. posterior to the long head of the triceps muscle at approximately the 7:00 o'clock position on the glenoid
- C. anterior to the origin of the long head of the triceps muscle at the 6:00 o'clock position on the glenoid
- D. just prior to entering the posterior deltoid
- E. there is no division between the anterior and posterior branches

4. An eleven-year-old Tanner stage-II adolescent presents with a torn anterior cruciate ligament. Magnetic resonance imaging reveals intact menisci. Which of the following is the most accurate statement?

- A. conservative treatment until growth plate closure rarely results in meniscal tears
- B. meniscal tears are uncommon in children with a tear of the anterior cruciate ligament
- C. physeal sparing operations restore isometry
- D. transphyseal reconstruction of the anterior cruciate ligament may be performed safely in this age-group with the use of soft-tissue grafts
- E. surgical stabilization is necessary to prevent reinjury

5. Which of the following statements best describes glenohumeral dislocation arthropathy?

- A. patients younger than forty years of age at the time of initial glenohumeral dislocation demonstrate a paucity of humeral head osteophytes, suggesting a rapid arthritic evolution
- B. patients older than sixty years of age at the time of initial glenohumeral dislocation demonstrate a paucity of humeral head osteophytes, suggesting a rapid arthritic evolution
- C. patients younger than forty years of age at the time of initial glenohumeral dislocation

- demonstrate a paucity of humeral head osteophytes, suggesting a slow arthritic evolution
- D. patients older than sixty years of age at the time of initial glenohumeral dislocation have large humeral head osteophytes, suggesting a slow arthritic evolution
- E. patients younger than forty years of age at the time of initial glenohumeral dislocation have large humeral head osteophytes, suggesting a rapid arthritic evolution
- 6. The most likely reason for the low, 0.5% recurrence rate observed when the musculofascial lengthening technique is used for submuscular transposition of the ulnar nerve at the elbow, is that:**
- A. the lengthened flexor-pronator muscle mass permits early range of motion of the elbow
- B. complete resection of the medial intermuscular septum is possible
- C. there is decreased intraneural pressure within the ulnar nerve during a full range of motion of the elbow
- D. a microsurgical internal neurolysis is not necessary
- E. none of the patients studied were receiving Workers' Compensation
- 7. Which group was reported to be at highest risk for nerve injury during limb-lengthening?**
- A. patients undergoing single-level femoral lengthening
- B. patients undergoing simultaneous femoral and tibial lengthening
- C. patients with a large limb-length discrepancy
- D. patients undergoing double-level tibial lengthening
- E. patients undergoing simultaneous humeral and radial lengthening
- 8. What features make up the pathognomonic radiographic and magnetic resonance imaging triad of traumatic posterior hip subluxation?**
- A. hemarthrosis
- B. iliofemoral ligament disruption
- C. acetabular lip fracture
- D. all of the above
- E. none of the above
- 9. Which radiographic acetabular fracture pattern demonstrated the lowest level of agreement with the intraoperative diagnosis?**
- A. t-shaped
- B. both-column
- C. anterior wall
- D. transverse plus posterior wall
- E. posterior column
- 10. Following operative treatment of a displaced, unstable ankle fracture, total braking time when driving an automobile returns to normal baseline by:**
- A. six weeks
- B. nine weeks
- C. twelve weeks
- D. fifteen weeks
- E. eighteen weeks
- 11. Which factor was the most important in determining the time to nerve recovery following nerve injury during a limb-lengthening procedure?**
- A. the number of centimeters lengthened
- B. the time elapsed from injury detection to decompression
- C. the specific nerve affected
- D. the age of the patient
- E. the patient's risk group
- 12. What added value to conventional radiographs is offered by computed tomography in the assessment of acetabular fractures?**
- A. distinguishing between elementary and associated fracture patterns
- B. identifying loose bodies and femoral head damage
- C. improving the reliability of Letournel's acetabular fracture classification
- D. dictating the surgical approach to be used for the treatment of acetabular fractures
- E. eliminating the need for the standard three plain radiographs of the pelvis (anteroposterior and 45° Judet oblique radiographs).
- 13. Which of the following lesions is the most common in traumatic unidirectional recurrent posterior subluxation?**
- A. reverse Hill-Sachs lesion
- B. lesion of the posterior aspect of the labrum
- C. tear of the posterior capsular ligament
- D. widening of the rotator interval
- E. posterior glenoid defect
- 14. Chronic exertional compartment syndrome of the forearm is a rare condition. Which of the following is considered the gold standard for diagnosing the condition?**
- A. resting intracompartmental pressure recording
- B. intracompartmental pressure recording after exercise
- C. intracompartmental pressure monitoring before, during, and after exercise
- D. magnetic resonance imaging before and after exercise
- E. blood-pool phase of a three-phase bone scan after exercise
- 15. A sixty-five-year-old worker sustains a mid-shaft femoral fracture when a weight falls on him at work. He reports that a twenty-year-old apprentice had the same accident a year earlier. What can you tell the worker about**

- the time needed for radiographic union relative to that needed for the younger man?**
- the time is likely to be longer
 - the time will be about the same
 - the time is likely to be shorter
 - the fracture in the older worker is not likely to reach radiographic union
 - the fracture in the apprentice is not likely to reach radiographic union
- 16. Which of the following factors has been shown to be the most strongly associated with occupational disability after hospitalization for treatment of anterior cruciate ligament injury?**
- gender
 - reconstruction of the anterior cruciate ligament
 - secondary comorbidities of the knee
 - psychosocial factors
 - body-mass index
- 17. The indication for treatment of nonunion of the greater trochanter following total hip arthroplasty should be primarily based on:**
- hip mobility
 - limp (Trendelenburg sign)
 - risk of loosening
 - risk of osteolysis
 - previous hip surgery
- 18. Patients undergoing simultaneous bilateral total knee replacement are at a significantly increased risk for all of the following EXCEPT:**
- intestinal ileus
 - gastrointestinal bleeding
 - thrombophlebitis
 - superficial infection
 - urinary tract infection
- 19. Which of the following is the least common cause of failure of total knee replacements?**
- instability
 - infection
 - polyethylene wear
 - aseptic loosening
 - failure to resurface the patella
- 20. An athlete who presents with symptoms of cervical spinal cord concussion and a cervical magnetic resonance image that documents only spinal stenosis:**
- should not be allowed to participate in sports
 - should be counseled that he or she is at increased risk for repeated episodes of spinal cord concussion and could sustain more permanent injury
 - should be allowed to participate in sports
 - should be counseled that he or she is at high risk for quadriplegia
 - should wear a protective orthosis during sports
- 21. Mobile-bearing knee replacements have been shown to have which of the following?**
- better survivorship when compared with fixed-bearing knee replacements
 - a reduced prevalence of lateral retinacular release
 - reduced polyethylene wear when compared with fixed-bearing knee replacements
 - improved range of motion when compared with fixed-bearing knee replacements
 - improved quadriceps strength when compared with fixed-bearing knee replacements
- 22. Which of the following is the most common cause of revision of a total knee replacement?**
- instability
 - loosening of the femoral component
 - loosening of the tibial component
 - patellofemoral complication
 - infection
- 23. An increased uptake within the cervical spinal cord on T2-weighted magnetic resonance images:**
- is associated with spinal cord contusion
 - is an indication that permanent spinal cord injury has occurred
 - is usually associated with a cervical fracture
 - never returns to normal
 - may be consistent with a good prognosis
- 24. The additional use of a thyroid collar by an orthopaedic surgeon protected by an apron:**
- allows an increase in the maximum permissible workload but does not modify the effective dose
 - reduces the effective dose and hence increases the maximum permissible workload
 - reduces cancer risk but not the effective dose
 - reduces the effective dose only when eye protection is also used
 - reduces the effective dose but increases the maximum permissible workload only when eye protection is also used
- 25. What is the most common location for ganglions on the wrist?**
- sheath of the extensor
 - scapholunate joint
 - lunotriquetral joint
 - midcarpal joint
 - triangular fibrocartilage complex
- 26. Following the use of a primary hemiarthroplasty to treat a severe proximal humeral fracture, which of the following factors is not predictive of the one-year Constant score:**
- the age of the patient
 - the presence of a neurovascular deficit
 - the need for a reoperation

- D. displacement of one or both tuberosities
E. loosening of the prosthesis
- 27. Tibial valgus is a known complication of leg lengthening with use of external fixation techniques. Which of the following factors is the most important in producing axial deviation of bone?**
- A. use of monolateral external fixation
B. age of the patient
C. imbalance between muscle forces on different sides of the bone
D. amount of lengthening obtained
E. loosening of external fixation pins
- 28. Which of the following factors is significantly associated with the rate of venous thrombosis after hallux valgus surgery?**
- A. body weight
B. age
C. duration of operation
D. body-mass index
E. nicotine use
- 29. Which of the following are the most consistent clinical signs of necrotizing fasciitis?**
- A. tenderness, erythema, warm skin, and bullae formation
B. tenderness, erythema, and warm skin
C. tenderness, erythema, and skin induration
D. tenderness, warm skin, and skin crepitus
E. erythema, skin induration, and warm skin
- 30. Complications occur frequently after surgical treatment of talar body fractures. Which of the following occurs most commonly after a fracture of the talar body?**
- A. nonunion
B. osteonecrosis
C. osteomyelitis
D. posttraumatic arthritis
E. painful hardware
- 31. Which of the following strategies has been shown in rats to have the potential to selectively decrease the damaging effects of irradiation on the growth plate in growing children?**
- A. calcium channel blockers
B. tumor-necrosis-alpha inhibitors
C. radioprotectant drugs
D. bcl-2 antisense treatment
E. bisphosphonates
- 32. Which of the following patients is at greatest risk for allogeneic blood transfusion regardless of the blood conservation technique used?**
- A. a fifty-five-year old man, with a baseline hemoglobin level of 155 g/L, undergoing primary total hip arthroplasty
B. a sixty-eight-year-old woman, with a baseline hemoglobin level of 125 g/L, undergoing revision total hip arthroplasty
C. a fifty-eight-year-old man, with a baseline hemoglobin level of 154 g/L, undergoing bilateral total knee arthroplasty
D. a fifty-seven-year-old woman, with a baseline hemoglobin level of 148 g/L, undergoing primary total knee arthroplasty
E. a sixty-seven-year-old woman, with a baseline hemoglobin level of 140 g/L, undergoing primary total hip arthroplasty
- 33. The parameter(s) that most accurately quantify angular deformity of the distal part of the femur in the frontal plane is (are):**
- A. radiographic anteroposterior tibiofemoral angle
B. radiographic mechanical axis deviation and lateral distal femoral angle
C. radiographic mechanical axis deviation
D. thigh-leg angle on physical examination
E. radiographic lateral distal femoral angle
- 34. The finding that a percutaneous injection of rhBMP-2 leads to increased stiffness followed by increased strength compared with control values during experimental fracture-healing suggests which of the following:**
- A. the fracture-healing process is accelerated and follows a normal sequence of repair
B. the fracture-healing process is accelerated but follows an abnormal sequence of repair
C. fracture-healing can be accelerated only if acquisition of strength precedes acquisition of stiffness
D. the fracture callus is more brittle than that seen during normal repair
E. this information cannot be used to determine if fracture-healing is improved or accelerated
- 35. In a prospective, randomized trial that compared intra-articular injection of a corticosteroid with that of hylan G-F 20 (Synvisc) for the treatment of osteoarthritis of the knee:**
- A. both treatments were shown to be ineffective (no improvement from baseline pain and functional scores)
B. both treatments resulted in improvements from baseline outcome scores, but no significant differences were found between the groups treated with hylan G-F 20 (Synvisc) and the corticosteroid
C. hylan G-F 20 (Synvisc) was significantly more effective than the corticosteroid
D. the corticosteroid was significantly more effective than hylan G-F 20 (Synvisc)
E. the only adverse reactions to treatment were found in patients treated with the corticosteroid
- 36. Which of the following bioactive factors exerts its osteogenic effect by a predominantly angiogenic mechanism?**
- A. rhBMP-2

- B. rhBMP-7 (osteogenic protein-1 [OP-1])
 C. transforming growth factor-beta
 D. platelet-derived growth factor
 E. fibroblast growth factor-2
- 37. Recovery of femoral nerve function in hemophilic patients after iliopsoas hemorrhage will most likely be:**
- A. complete for the sensory and motor components
 B. complete for the sensory component and incomplete for the motor component
 C. incomplete for the sensory component and complete for the motor component
 D. incomplete for the sensory and motor components
 E. no functional recovery expected
- 38. Which of the following factors was the strongest predictor of postoperative flexion following total knee arthroplasty?**
- A. preoperative alignment
 B. preoperative flexion
 C. preoperative diagnosis
 D. age
 E. type of prosthesis
- 39. Heterotopic ossification around the elbow following burns in children is most likely to occur in proximity to which structure?**
- A. median nerve
 B. ulnar nerve
 C. radial nerve
 D. biceps tendon
 E. triceps tendon
- 40. Valgus-producing high tibial osteotomy for a knee with varus malalignment and degenerative arthritis in the medial compartment is contraindicated in patients with which of the following?**
- A. mild patellofemoral arthritis
 B. an arc of motion of 105°
 C. lateral thrust
 D. intact, functional anterior cruciate ligament
 E. ipsilateral hip osteoarthritis
- 41. What is the most common reported cause of spontaneous hemarthrosis after total knee arthroplasty?**
- A. impingement of hypertrophic vascular synovium
 B. arteriovenous malformation
 C. a bleeding genicular pseudoaneurysm
 D. proliferative villonodular synovitis
 E. loosening of the tibial component of the prosthesis
- 42. Compared with conventional polyethylene, which of the following is a characteristic of crosslinked polyethylene:**
- A. higher wear rate
 B. higher melting temperature
 C. lower elongation to break
 D. lower fatigue resistance
 E. darker color
- 43. Which factor resulted in the greatest increase in postoperative flexion after total knee arthroplasty in knees with preoperative varus alignment?**
- A. lateral retinacular release
 B. posterior capsular release
 C. removal of anterior femoral osteophytes
 D. removal of posterior femoral osteophytes
 E. postoperative manipulation
- 44. Wound dehiscence about the elbow was encountered in children with burns in association with:**
- A. radiation
 B. posteromedial incision
 C. posterior incision
 D. combined posteromedial and lateral incisions
 E. anti-inflammatory agents
- 45. Arthroscopic débridement for unicompartmental arthritis of the knee is most predictably successful when performed for which of the following:**
- A. 15° of varus malalignment
 B. unstable medial meniscal tear with mechanical symptoms
 C. anterior cruciate ligament deficiency
 D. global knee pain
 E. chondrocalcinosis
- 46. What is the acceptable initial treatment of hemarthrosis after total knee arthroplasty?**
- A. aspiration, ice packs, and rest
 B. angiography and embolization
 C. arthrotomy and ligation of the bleeding vessel
 D. only close follow-up
 E. continuous passive motion
- 47. Regarding hips with a metal-on-metal bearing, which of the following statements is true?**
- A. the risk of hypersensitivity is reduced
 B. there is no difference in overall cancer risk
 C. the fracture risk is increased
 D. volumetric wear increases with increasing head size
 E. lower serum chromium levels
- 48. When assessing radiographs for the presence of periacetabular osteolysis following total hip replacement, orthopaedists need to be aware of the merits and limitations of radiographs. Which of the following statements is correct?**
- A. radiographs have a high sensitivity and low specificity for the detection of periacetabular osteolysis

- B. once an osteolytic lesion is detected on a radiograph, the likelihood that it truly exists is high
- C. the two-dimensionally measured size of an osteolytic lesion represents the true volume of the defect
- D. radiographs have a low sensitivity and specificity for the detection of periacetabular osteolysis
- E. assessing multiple views does not improve the detection rate for periacetabular osteolysis

49. Which is the most frequent complication of total ankle replacement?

- A. deep infection
- B. nerve injury
- C. wound-healing problems

- D. component loosening
- E. meniscal fracture

50. Which of the following is the most important factor affecting the prognosis for most musculoskeletal tumors?

- A. age of the patient
- B. stage at which the tumor is diagnosed
- C. pain
- D. location of the tumor
- E. gender of the patient

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 October 2003 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of adult lower extremity reconstructive surgery and spine surgery? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of hip, knee, and spine 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. Is this your own copy of *The Journal*?
 Yes No
2. Which of the following best describes your practice type?
 General orthopaedics
 General orthopaedics with subspecialty interest
 Exclusively subspecialty
 Resident or student
 Researcher
 Other: _____
3. 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	
4. 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.

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 |
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| 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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