
THE JOURNAL OF BONE & JOINT SURGERY
CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

APRIL, MAY, JUNE
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 April, May, and June issues of the American volume of *The Journal of Bone and Joint Surgery* (Volume 85-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 \$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 October 15, 2003.**

1. What is the causal organism in melioidotic septic arthritis?

- A. *Staphylococcus epidermidis*
- B. *Salmonella enteritidis*
- C. *Aeromonas hydrophila*
- D. *Burkholderia pseudomallei*
- E. *Yersinia enterocolitica*

2. The most common anatomical variation of the anterosuperior aspect of the glenoid labrum is:

- A. sublabral foramen only
- B. sublabral foramen with a cord-like middle glenohumeral ligament
- C. absent labrum with a cord-like middle glenohumeral ligament
- D. absent labrum with a band-like or sheet-like middle glenohumeral ligament
- E. absent labrum

3. Which physical therapy regimen is suggested, by biomechanical studies, to be the safest for preserving articular reduction and elbow range of motion following treatment of an olecranon fracture with a tension band?

- A. early active extension
- B. early passive range of motion and splinting
- C. immobilization for six weeks
- D. immobilization for three weeks followed by active range of motion and strengthening
- E. early triceps-strengthening exercises

4. Which of the following is a major risk factor for the development of melioidotic septic arthritis?

- A. chronic renal failure
- B. diabetes mellitus
- C. steroid usage
- D. rheumatoid arthritis
- E. thalassemia

5. Intramedullary nail fixation of distal tibial fractures is weakest in resisting:

- A. valgus flexion loads
- B. varus flexion loads
- C. torsional forces
- D. longitudinal loads
- E. shear forces

6. When comparing operative and nonoperative treatment of burst fractures of the thoracolumbar junction in patients without a neurologic deficit, significant differences between the groups at the time of final follow-up can be expected in terms of:

- A. kyphosis
- B. canal compromise
- C. return to work
- D. cost
- E. duration of stay in the hospital

- 7. Variations of the anterosuperior aspect of the labrum are significantly associated with which of the following? (Choose the best answer.)**
- rotator cuff tears
 - anterior shoulder instability
 - increased internal rotation of the arm and anterosuperior labral fraying
 - posterior Bankart lesions
 - rupture of the long head of the biceps
- 8. The reported clinical practice guideline for the treatment of septic arthritis in children:**
- applies to all children with septic arthritis, including those with associated osteomyelitis, abscesses, or immunocompromise
 - resulted in less variation in process of care, improved efficiency of care, and no increase in negative outcomes
 - was developed on the basis of expert opinion only
 - was intended as a strict protocol for all patients
 - recommends six weeks of home intravenous antibiotic therapy for uncomplicated cases of septic arthritis that have responded to initial treatment
- 9. Closure of the growth plate at the end of adolescence is due to:**
- a decline in growth hormone levels
 - an increase in estrogen levels
 - a decreased rate of chondrocyte proliferation
 - an elevation in thyroid hormone levels
 - an increase in glucocorticoid levels
- 10. Above-the-knee amputation is very rare after total knee replacement. Which of the following complications related to the arthroplasty is the most common reason for amputation?**
- arterial injury
 - infection
 - periprosthetic fracture
 - severe bone loss
 - neurologic injury
- 11. The lack of muscular protection that can resist rotational forces at the knee joint in size-matched male and female athletes:**
- is unrelated to gender
 - has both a passive and an active component
 - is related to the percentage of body fat
 - is determined by height
 - is the sole predictor of injury probability
- 12. In a throwing athlete, the amount of bone that can be removed from the posteromedial corner of the olecranon without increasing strain on the medial collateral ligament is:**
- osteophytes only
 - <3 mm
 - <6 mm
 - <9 mm
 - 20% of the articular surface
- 13. All of the following regarding symptomatic malunion of midshaft fractures of the clavicle are true, EXCEPT:**
- shoulder range of motion is well maintained
 - the distal fragment is typically displaced inferiorly and medially
 - an intercalary iliac crest bone graft is generally required for reconstruction
 - symptoms consistent with thoracic outlet syndrome often develop
 - the fracture is associated with clavicular shortening of ≥ 2 cm
- 14. Ankle instability has been postulated as a cause of donor-site morbidity after free fibular harvest. A residual distal fibular segment of less than which of the following lengths has been shown to produce ankle instability during repetitive physiologic loads in an experimental model:**
- 10 cm
 - 8 cm
 - 6 cm
 - 10% of the total fibular length
 - 20% of the total fibular length
- 15. The advantage of intramedullary fixation over plate-and-screw fixation of an intercalary structural allograft is that it:**
- allows micromotion at the host-allograft interface
 - provides rigid fixation of the allograft
 - provides superior protection against fracture
 - minimizes the risk of nonunion
 - minimizes the risk of infection
- 16. What is the risk of reinfection after shoulder arthroplasty performed for the treatment of postinfectious glenohumeral arthritis?**
- <1%
 - 2% to 5%
 - 6% to 10%
 - 11% to 20%
 - >20%
- 17. High tension in an anterior cruciate ligament graft in flexion limits flexion and increases anterior laxity. Which of the following factors has been shown to decrease tension in flexion when the transtibial technique is used to drill the femoral tunnel through the tibial tunnel?**
- angle of the femoral tunnel of 60° in the sagittal plane
 - angle of the tibial tunnel of 60° in the sagittal plane
 - angle of the tibial tunnel of 60° with the medial joint line in the coronal plane
 - movement of the tibial tunnel medially so that

- the graft impinges on the posterior cruciate ligament
- E. movement of the femoral tunnel medially so that the graft impinges on the posterior cruciate ligament
- 18. When bulk femoral head autograft is used to reconstruct the true acetabulum in a patient with developmental dysplasia of the hip, what percentage of the socket should be covered by the native ilium to provide long-term durability of the acetabular reconstruction?**
- A. $\geq 80\%$
 B. $\geq 50\%$
 C. $\geq 40\%$
 D. $\geq 30\%$
 E. $\geq 20\%$
- 19. Which of the following is true for the use of step-cuts with intercalary allografts?**
- A. the step-cut should be undersized off the midsagittal plane by at least 2 mm to minimize micromotion
 B. a standard midsagittal step-cut optimizes rotational stability
 C. step-cuts must always be avoided
 D. step-cuts should be used with all intercalary allografts
 E. a modest modification that undersizes the step-cut by approximately 1 mm can greatly improve rigidity at the interface and minimize stresses that can lead to fracture
- 20. Resection of ununited humeral condyles during semiconstrained total elbow arthroplasty:**
- A. increases operative complexity
 B. decreases Mayo Elbow Performance Scores
 C. results in early loosening of the humeral component
 D. has no effect on elbow, wrist, or forearm strength
 E. decreases forearm rotation
- 21. When performing surgery on a patient with acute prepatellar bursitis, one may need to expose the deepest of the three prepatellar bursae. The deepest of the prepatellar bursae is found just beneath which structure?**
- A. skin
 B. rectus femoris tendon
 C. fascia lata
 D. intermediate oblique aponeurosis
 E. patellar tendon
- 22. Which type of ankle fracture is most frequently seen in elderly, non-black women:**
- A. isolated fibular fracture
 B. bimalleolar fracture
 C. trimalleolar fracture
 D. isolated medial malleolar fracture
 E. isolated posterior malleolar fracture
- 23. In a rabbit intertransverse process fusion model, starting indomethacin at what time-point following the arthrodesis had a significant adverse effect on the fusion rate compared with the fusion rates in controls?**
- A. one week postoperatively
 B. two weeks postoperatively
 C. three weeks postoperatively
 D. four weeks postoperatively
 E. six weeks postoperatively
- 24. LIM mineralization protein-1 (LMP-1) exerts its osteoinductive effects by increased expression of what type of proteins?**
- A. intracellular proteins
 B. extracellular proteins
 C. platelet-derived growth factors
 D. bone morphogenetic proteins
 E. vascular growth factors
- 25. Instability is one of the frequent complications following shoulder arthroplasty. The instability is most commonly attributed to which of the following?**
- A. subscapularis disruption
 B. position of the glenoid component
 C. altered rotation of the humeral component
 D. abnormal capsular tension and/or rotator cuff dysfunction
 E. wear or loosening of the glenoid component
- 26. Important elements of the operative treatment of unstable nonunions of the distal part of the humerus include all of the following EXCEPT:**
- A. stable plate-and-screw fixation
 B. release of the contracted elbow capsule
 C. vascularized bone-grafting
 D. identification and protection of the ulnar nerve
 E. identification and protection of the radial artery
- 27. Which of the following terms best describes the mechanism of bone formation induced by LMP-1?**
- A. membranous bone formation by transplanted cells
 B. endochondral bone formation by transplanted cells
 C. membranous bone formation by host cells
 D. endochondral bone formation by host cells
 E. membranous bone formation by host and transplanted cells
- 28. Reorientation of the acetabulum is frequently used to correct acetabular dysplasia. Which of the following factors has been**

- shown to be important for the achievement of a good long-term clinical outcome?**
- gender and weight of the patient
 - concomitant arthrotomy
 - size of the femoral head
 - satisfactory joint congruency after surgical correction
 - concomitant proximal femoral osteotomy
- 29. Which is the most common complication of conversion of a fused knee with use of a posterior stabilized total knee prosthesis?**
- instability of the knee
 - quadriceps tendon rupture
 - patellar tendon avulsion
 - skin edge necrosis
 - recurrence of infection
- 30. Approximately what percentage of patients were not completely compliant with preoperative instructions regarding avoidance of wrong-site surgery?**
- 0%
 - 15%
 - 40%
 - 68%
 - 97%
- 31. Neck pain caused by referred shoulder impingement can be diagnosed with use of each of the following EXCEPT:**
- a positive referred impingement sign
 - a pseudocyst in the proximal part of the humerus
 - a positive referred impingement test
 - relief of neck pain following subacromial injection
 - a chief symptom of shoulder pain
- 32. To produce the strongest (most resistant to shear) bone graft for use in impaction bone-grafting:**
- cancellous allograft should be passed once through a large-aperture bone mill
 - a large amount of compactive force should be applied to the graft
 - whichever mill is used, the graft should be washed free of fat and marrow
 - cartilage, cystic material, and cortical bone need not be removed
 - graft particles should be homogeneous in size
- 33. Of the following factors, which one decreases the quality of the survivorship of revision total hip arthroplasty after fracture of a ceramic femoral head?**
- exchange of the cup
 - a posterolateral surgical approach
 - use of a new femoral head made of stainless steel
 - performance of a synovectomy that is as extensive as possible
 - a long delay between the femoral head fracture and the revision procedure
- 34. What is the main complication of the posterolateral approach to an os trigonum?**
- peroneal palsy
 - sural nerve injury
 - flexor hallucis longus tear
 - wound slough
 - plantaris muscle tear
- 35. Joint stiffness is a complication of lengthening. Which technique preserves the best range of motion of the knee during femoral lengthening:**
- use of a circular Ilizarov external fixator fixed with fine wires
 - use of a circular Ilizarov external fixator fixed with threaded half-pins or screws
 - use of a monolateral external fixator
 - use of an Albizzia intramedullary lengthening nail system
 - lengthening over a nail
- 36. Which of the following statements is true regarding technical difficulties associated with conversion of a varus distal femoral osteotomy to a total knee arthroplasty?**
- patella infera is common and leads directly to exposure difficulties and increased risk of patellar tendon avulsion
 - intra-articular correction of extra-articular deformity may lead to ligamentous instability
 - varus deformity of the distal part of the femur often requires a more medial starting point when drilling for an intramedullary femoral alignment guide
 - increased rates of patellar dislocation have been reported secondary to difficulties in achieving proper rotation of the tibial component
 - less resection of the medial femoral condyle relative to the resection of the lateral condyle will result in varus alignment
- 37. Bone morphogenetic proteins upregulate the expression of their secreted antagonists in an autoregulatory negative feedback loop that controls the induction of osteogenesis. Characteristic clinical features of the condition in which there is a paresis of this autoregulatory negative feedback loop are:**
- short stature and heterotopic ossification
 - blue sclerae and skeletal fragility
 - malformed great toes and heterotopic ossification
 - scoliosis and multiple fractures
 - deafness and osteosclerosis

- 38. Where, anatomically, is the os trigonum located?**
- superoposterior aspect of the talus
 - inferoposterior aspect of the talus
 - posteromedial aspect of the talus
 - posterolateral aspect of the talus
 - lateral aspect of the talus
- 39. Which of the following statements about operative release of complete osseous ankylosis of the elbow is most accurate:**
- the results are better in patients with ankylosis related to a severe burn than they are in patients with ankylosis related to trauma
 - the results are better in patients with ankylosis related to trauma than they are in patients with ankylosis related to a severe burn
 - the results are predictably good for patients with ankylosis related to either a severe burn or trauma
 - most patients have substantial gains in motion, but recurrent contractures and reoperations are common in both post-burn and post-trauma patients
 - the risk of neurovascular injury is high
- 40. After arthroscopic acromioplasty for primary impingement syndrome, which factor most directly correlates with the time it takes to return to full-duty work?**
- compliance with postoperative physical therapy
 - general anesthesia versus regional anesthesia
 - the demand level of the job to which the patient is returning
 - receiving Workers' Compensation benefits
 - an arthroscopic, rather than an open, procedure
- 41. Assessments of the function of shoulders with a rotator cuff tear are:**
- dependent primarily on the size of the cuff tear
 - comparable across the practices of different surgeons
 - worse for females than for males
 - unaffected by the age of the patient
 - unrelated to the general health status of the patient
- 42. Which of the following best describes the function of the tibialis anterior after split transfer of its distal tendon to the cuboid?**
- it is similar to that of the tibialis posterior
 - it is sensitive to small changes in medial-to-lateral tension balance
 - it is a slight everter of the hindfoot following the procedure
 - it acts to invert the hindfoot when the foot is everted
 - it is similar to that of the intact tibialis anterior
- 43. Long-term follow-up of cementless total hip replacements has demonstrated that the major reason for reoperation is related to:**
- dislocation
 - infection
 - fracture
 - femoral loosening and osteolysis
 - acetabular loosening and osteolysis
- 44. The optimal position of the hindfoot following fusion of the ankle is:**
- 5° of plantar flexion, neutral rotation, and 5° of valgus
 - neutral dorsiflexion, 15° of external rotation, and 5° of valgus
 - 15° of dorsiflexion, 15° of external rotation, and 20° of valgus
 - neutral dorsiflexion, 5° of internal rotation, and 5° of valgus
 - 5° of plantar flexion, 15° of external rotation, and 5° of varus
- 45. In adolescent patients with juvenile rheumatoid arthritis who require total knee replacement, which of the following should not be expected:**
- pain relief
 - functional improvement
 - a much improved range of motion
 - a substantial complication rate
 - a substantial reoperation rate
- 46. Which variable is the most important risk factor for plantar fasciitis in at-risk individuals?**
- body weight
 - prolonged standing
 - limited ankle dorsiflexion
 - gender
 - age
- 47. The most common cause of ankle arthritis is:**
- inflammatory arthropathy
 - idiopathic
 - trauma
 - hindfoot deformity
 - neuropathic
- 48. When cementing a smooth polyethylene liner into an acetabular shell, which of the following will most improve the mechanical strength of the construct?**
- texturing the acetabular shell
 - texturing the liner vertically
 - texturing the liner vertically and circumferentially
 - maximizing cement thickness (using a

- smaller liner)
E. minimizing cement thickness (using a larger liner)

49. Osteonecrosis is a significant complication for some patients with slipped capital femoral epiphysis. Which of the following patient factors is most closely related to the development of osteonecrosis?

- A. patient weight
B. patient race
C. classification of the slip as acute
D. classification of the slip as unstable
E. patient gender

50. The most important factor influencing the outcome of corrective osteotomy for deformity in Paget disease is:

- A. patient age
B. location of the osteotomy
C. medical treatment
D. type of bone affected
E. type of fixation

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 2003 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of shoulder, foot and ankle, and hand surgery? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of shoulder, foot and ankle, 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. 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
 - Classified advertising
 - Clinical scientific articles
 - Orthopaedic Forum
 - Current Concepts
 - Letters to The Editor
 - Basic scientific articles
 - Instructional Course Lectures

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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

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|---------------|---------------|---------------|
| 1. A B C D E | 18. A B C D E | 35. A B C D E |
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