

CME 1

THE JOURNAL OF BONE & JOINT SURGERY · JBJS.ORG | VOLUME 83-A · CME III · JUL, AUG, SEPT 2001

THE JOURNAL OF BONE & JOINT SURGERY
CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

JULY, AUGUST, SEPTEMBER
2001

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 83-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 will be January 15, 2002.**

1. **Which of the following conditions best predicts postoperative pulmonary dysfunction in patients with femoral fracture treated with intramedullary nailing?**
 - A. extensive reaming of the femoral canal
 - B. associated pulmonary contusion
 - C. associated chronic obstructive pulmonary disease
 - D. alveolar dead space of >0.2 (20%)
 - E. extensive smoking history
2. **When performing an oblique sliding osteotomy of the fifth metatarsal to eliminate symptoms from a bunionette, the distal fragment should be displaced:**
 - A. medially or medially and inferiorly
 - B. laterally or laterally and inferiorly
 - C. superiorly with a medial shift
 - D. superiorly with a lateral shift
 - E. proximally only
3. **Approximately what percentage of patients who have been treated with arthroscopically assisted anterior cruciate ligament reconstruction of the knee and have a stable knee will have degenerative arthritic changes visible radiographically with follow-up of greater than six years?**
 - A. 0
 - B. 10
 - C. 20
 - D. 30
 - E. 40
4. **Preoperative planning (approach, length of the prosthesis, thickness of the prosthesis, and extent of a femoral osteotomy) is most important for successful femoral revision with a revision stem with diaphyseal fixation. What is the most important information necessary for preoperative planning of a femoral revision without cement?**
 - A. the amount of shortening of the affected lower extremity compared with that of the contralateral limb
 - B. the preoperative stability of the greater trochanter
 - C. whether the loosened stem had cemented or cementless fixation
 - D. the most proximal part of the femur at which stable fixation of the prosthesis is possible
 - E. the amount of anterior bow of the femur
5. **In patients undergoing total knee replacement with cement, the use of a tourniquet during the procedure:**
 - A. does not reduce the total blood loss
 - B. does not reduce the amount of intraoperative blood loss
 - C. leads to coagulopathic problems

- D. results in a higher prevalence of peripheral nerve palsies
E. results in a shorter operative time
- 6. Posterior cruciate ligament-retaining total knee arthroplasty in patients with rheumatoid arthritis yields satisfactory results at the time of intermediate-term follow-up (mean, 10.5 years). The most common reason for revision is:**
- A. aseptic loosening
B. posterior instability
C. failure of a metal-backed patellar component
D. excessive wear between the tibial insert and its tray
E. fracture about either the femoral or the tibial component
- 7. Long-standing varus deformity of the elbow can lead to tardy posterolateral instability of the elbow. This is due to:**
- A. repetitive traumatic dislocations and/or subluxations of the elbow
B. a violent force causing the elbow to dislocate posteriorly
C. chronic lateral overpull on the olecranon and varus of the radius
D. hypoplasia of the medial epicondyle and medial trochlea of the humerus
E. a shift of the mechanical axis of the elbow that produces repetitive external rotation torque
- 8. Recent clinical and basic research shows that oral glucosamine taken by patients with osteoarthritis of the knee:**
- A. decreases joint pain as compared with placebo, but the mechanism of this effect remains unknown
B. decreases joint pain as compared with a placebo and oral analgesics, but the mechanism of this effect remains unknown
C. decreases joint pain as compared with a placebo by decreasing inflammation in synovial tissue
D. increases the synthesis of proteoglycans in articular cartilage but has less effect on joint pain than oral analgesics
E. decreases the degradation of proteoglycans in articular cartilage but has less effect on joint pain than oral analgesics
- 9. What is the most important factor in predicting the progression of diabetic neuropathy?**
- A. presence or absence of vascular disease
B. glucose control
C. type of diabetes
D. age of the patient
E. duration of the diabetes
- 10. Nonoperative treatment of displaced fractures of the medial epicondyle in children with a long arm cast:**
- A. frequently results in nonunion of the fragment but has long-term outcomes comparable with those of internal fixation
B. results in union of the fragment in the majority of children but has long-term outcomes that are poorer than those of internal fixation
C. results in cubitus valgus due to overgrowth of the medial side of the distal humeral growth plate
D. provides long-term functional results that are inferior to those of surgical excision of the fragment with ligament repair
E. results in a high prevalence of union of the fragment but usually produces unacceptable elbow joint stiffness
- 11. Computed tomography and intraoperative fluoroscopy appear to be equally accurate in assessing for possible joint penetration by a periacetabular screw used in fixation of a fracture. However, an important disadvantage of computed tomography with use of a 4-mm slice thickness at 3-mm intervals is that:**
- A. it is less sensitive, with an increased risk that an unnecessary reoperation will be performed
B. it is less sensitive, with an increased risk that joint penetration will be missed
C. it is less specific, with an increased risk that an unnecessary reoperation will be performed
D. it is less specific, with an increased risk that joint penetration will be missed
E. it is difficult to obtain in every patient
- 12. Total knee arthroplasty for posttraumatic degenerative arthritis following open reduction and internal fixation of tibial plateau fractures is associated with:**
- A. an increased prevalence of postoperative periprosthetic fractures
B. an increased prevalence of intraoperative fractures of the tibia
C. an increased prevalence of late failure due to loosening of the tibial component
D. an increased prevalence of rupture of the extensor mechanism during surgery
E. decreased functional status and quality of life as compared with those following arthroplasty for primary osteoarthritis of the knee
- 13. A diabetic patient with limited joint mobility in the fingers may be at increased risk for ulcerations in the forefoot because:**
- A. the skin of the foot is atrophic in patients with limited joint mobility
B. sensory neuropathy is always more profound in patients with limited joint mobility
C. limited finger motion can be associated with Achilles contractures and limited hind-foot motion

- D. limited joint mobility is a sign of vascular disease
 E. limited joint mobility implies sympathetic dysfunction and problems with perspiration
- 14. Which of the following regarding glenoid labral cysts is true?**
- A. glenoid labral cysts are the most common cause of neuropathy
 B. an underlying glenoid tear is present in a minority of patients
 C. image-guided aspiration therapy may relieve nerve compression symptoms but not those from shoulder instability
 D. since nerve compression is present, a course of conservative therapy is contraindicated
 E. infraspinatus muscle atrophy is a relative contraindication to image-guided aspiration therapy
- 15. In long-term (more than ten-year) follow-up studies of Porous Coated Anatomic (PCA) total hip replacements, the most important variable influencing the need for revision surgery was:**
- A. size of the prosthetic femoral head
 B. gender of the patient
 C. thickness of the polyethylene liner
 D. age of the patient at the time of the initial surgery
 E. cause of the arthritis that led to the initial arthroplasty
- 16. While most fractures of bone heal, some do not heal because of unknown causes. In the future, products will be available that stimulate cells in the fracture to form cartilage and bone, thus leading to healing. Which of the following factors has been shown to accelerate fracture-healing or induce healing in nonunions?**
- A. superficial zone proteins
 B. bone morphogenetic proteins
 C. hyaluronic acid
 D. proteoglycans
 E. type-X collagen
- 17. Which of the following proteins is a target for therapies designed to inhibit loosening of total joint components?**
- A. transforming growth factor-beta (TGF- β)
 B. tumor necrosis factor-alpha (TNF- α)
 C. insulin-like growth factor-1 (IGF-1)
 D. vascular endothelial growth factor (VEGF)
 E. fibroblast growth factor (FGF)
- 18. Following total knee arthroplasty, patients with ankylosing spondylitis are more likely to have which of the following acute complications?**
- A. pulmonary complications
 B. deep infection
 C. instability of the patella
 D. deep venous thrombosis
 E. heterotopic ossification
- 19. Which of the following most accurately describes the characteristic deformity of a malunited dorsally displaced (Colles) fracture?**
- A. loss of volar tilt, loss of length relative to the ulna, and pronation of the distal fragment
 B. loss of volar tilt, loss of length relative to the ulna, and supination of the distal fragment
 C. increase in volar tilt, loss of length relative to the ulna, and increase in ulnar inclination of the distal fragment articular surface
 D. loss of volar tilt, increase in length relative to the ulna, and neutral rotation of the distal fragment
 E. dorsal displacement, increase in ulnar inclination, and dorsal intercalary segment instability of the carpus
- 20. A recent study of Internet use among academic orthopaedic departments in the United States revealed that:**
- A. academic departments are maximizing their use of the Internet
 B. interdepartmental exchange of information through the Internet is common
 C. information supplied by individual departments on the Internet is easily accessible
 D. <50% of the departments use the Internet for patient education or to provide information on clinical services
 E. information posted on the Internet is up-to-date
- 21. After disruption of the acromioclavicular ligaments, the most important structure(s) that prevents posterior translation of the clavicle is (are):**
- A. the meniscal ligaments in the acromioclavicular joint
 B. the coracoacromial ligaments
 C. the conoid ligament
 D. the trapezoid ligament
 E. the coracoclavicular fascia
- 22. Operative treatment of the "floating shoulder" (that is, fracture of the neck of the glenoid combined with fracture of the clavicle or an unstable separation of the acromioclavicular joint) has been shown to improve what functional parameter?**
- A. the range of forward elevation of the shoulder
 B. internal rotation strength when normalized for hand dominance
 C. external rotation strength when normalized for hand dominance
 D. overall patient satisfaction as measured on the Short Form-36
 E. the range of lateral abduction of the shoulder

- 23. The occurrence of anterior knee pain following total knee arthroplasty is most likely related to:**
- the severity of preoperative anterior knee pain
 - the degree of chondromalacia of the patella
 - the surgical technique
 - whether or not the patient is morbidly obese
 - whether or not the patella was resurfaced
- 24. Bilateral concomitant rupture of the patellar tendon is most commonly associated with:**
- patient age of less than twenty years
 - patient age of more than sixty-five years
 - chronic overuse in jumping sports
 - chronic systemic disease
 - an underlying genetic deficiency in type-I collagen
- 25. Which of the following best describes the three major conditions of the distal radioulnar joint following distal radial fracture that are responsible for pain and/or limited forearm rotation?**
- incongruity, nonunion of the ulnar styloid, and instability
 - incongruity, palmar capsule contracture, and nonunion of the ulnar styloid
 - incongruity, instability, and ulnocarpal impaction
 - instability, palmar capsule contracture, and incongruity
 - instability, angulation of the ulna, and incongruity
- 26. The ratio between the mean percentage of patients who present to their primary care physician with a chief complaint related to the musculoskeletal system and the mean percentage of the curriculum that Canadian medical schools devote to musculoskeletal education is approximately:**
- 9:1
 - 4:1
 - 1:1
 - 1:4
 - 1:9
- 27. The use of an interactive patient-education video program for patients with low-back disorders:**
- improves postoperative outcomes
 - positively affects patient satisfaction
 - is no better than printed material in explaining disease processes
 - makes it less likely that the patient will choose surgical treatment
 - is too expensive to justify widespread implementation
- 28. Which of the following factors is predictive of the final functional result of a total hip arthroplasty performed for the treatment of an ankylosed hip?**
- duration of fusion
 - type of fusion
 - initial diagnosis
 - number of previous operations
 - status of the gluteal muscles
- 29. Which of the following structures is most likely responsible for blocking closed reduction of an isolated dislocation of the cuboid?**
- bifurcate ligaments
 - peroneus brevis tendon
 - base of the fifth metatarsal
 - peroneus longus tendon
 - cuboid-calcaneal joint capsule
- 30. Which of the following best describes the radiographic growth of the cervical vertebral bodies?**
- rapid during the first five years of life and then slower until maturity
 - rapid during the first ten years of life and then slower until maturity
 - linear throughout growth
 - slow during the first five years of life and then rapid until maturity
 - maximum between ages ten and twelve in girls and between ages twelve and fourteen in boys
- 31. Measuring patients' expectations of knee surgery can guide patient education and enhance shared decision-making. Which of the following regarding patients' expectations is most true?**
- patients' expectations of knee surgery are independent of diagnosis
 - patients' expectations of knee surgery are independent of functional status
 - patient-derived surveys provide a means to identify possibly unattainable expectations
 - psychosocial expectations are not major considerations for patients undergoing knee surgery
 - patients' expectations of knee surgery do not have a role in postoperative assessment
- 32. Compression of the humeral head into the glenoid labral concavity keeps the humeral head centered. The stability ratio is defined as the force that resists subluxational translation divided by the applied compressive force. This force is lowest in which direction:**
- superior
 - anterior
 - inferior
 - anterior-superior
 - anterior-inferior
- 33. Which of the following magnetic resonance imaging abnormalities in asymptomatic indi-**

- viduals are most closely associated with the development of low-back or leg pain with long-term follow-up (more than seven years)?**
- spinal stenosis and disc herniation
 - disc herniation and disc bulging
 - spinal stenosis and disc degeneration
 - disc herniation and disc degeneration
 - disc bulging and spinal stenosis
- 34. Which of the following was the most common radiographic abnormality following arthroplasty with a metallic radial head for a radial head fracture that was too comminuted to internally fix?**
- marginal osteophytes
 - joint space narrowing
 - capitellar osteopenia
 - heterotopic bone formation
 - subchondral sclerosis
- 35. A sixty-year-old woman with a complete tenth thoracic spinal cord injury of twenty years' duration sustains a lumbar compression fracture. The etiology of the compression fracture is most likely related to:**
- the spinal cord injury
 - other factors unrelated to the spinal cord injury
 - the age of the patient
 - the duration of the spinal cord injury
 - the combination of C and D
- 36. Stenosis of the gluteal arteries is a rare cause of claudication-type groin pain because:**
- the arteries are not affected by atherosclerosis
 - there is ample pelvic collateral circulation
 - the arteries are not damaged in hip surgery
 - claudication pain involving the abductor muscles is not referred to the groin
 - postsurgical scarring cannot affect the gluteal arterial circulation
- 37. Which is the most frequently encountered clinically important complication of the Swanson silicone trapezium implant?**
- infection at the site of the prosthesis
 - breakage of the prosthesis
 - dislocation
 - silicone-induced synovitis
 - nerve palsy
- 38. Which of the following statements concerning osteonecrosis of the femoral head is most true?**
- it is a disease state that is easy to model
 - osteogenic protein-1 is definitely useful for patients with osteonecrosis
 - free iliac crest bone graft is the most reliable graft for treatment of femoral head defects
 - the dog is not a suitable model for studying femoral head defects
- 39. All of the following have been associated with increased perioperative mortality following total knee arthroplasty EXCEPT:**
- simultaneous bilateral total knee arthroplasty
 - age greater than seventy years
 - use of a cemented prosthesis
 - revision surgery
 - preexisting cardiovascular disease
- 40. At which knee flexion angles does internal rotation result in less posterior laxity than external rotation in knees in which the posterior cruciate and meniscomfemoral ligaments have been cut?**
- 60° and 90°
 - 30° and 90°
 - 0° and 30°
 - 30° and 60°
 - 0° and 90°
- 41. Pharmaceutical companies often purchase physicians' prescribing patterns from local pharmacies. This practice raises several ethical issues because:**
- patients' names are supplied with the data
 - the data can be used to influence physicians' prescribing patterns
 - the physicians receive no reimbursement for the data
 - patients are contacted to discuss the data
 - the data are posted on pharmaceutical web sites
- 42. In patients with ipsilateral scapular neck and mid-shaft clavicular fractures, the glenoid fragment is not floating unless there is concomitant disruption of which ligaments?**
- coracohumeral and acromioclavicular
 - coracohumeral and coracoacromial
 - coracoacromial and acromioclavicular
 - coracoclavicular and acromioclavicular
 - coracoacromial and sternoclavicular
- 43. The treatment of mixed tumor arising in bone should be:**
- curettage
 - curettage and adjuvant radiation therapy
 - curettage and a surgical adjuvant (phenol, cryosurgery)
 - resection
 - amputation
- 44. The recommended operative treatment for a varus aligned knee with posterolateral ligament deficiency and a prior failed anterior cruciate ligament reconstruction is:**
- high tibial osteotomy
 - high tibial osteotomy and anterior cruciate ligament reconstruction simultaneously

- C. high tibial osteotomy followed by anterior cruciate ligament and posterolateral ligament reconstruction
- D. high tibial osteotomy and anterior cruciate ligament and posterolateral ligament reconstruction simultaneously
- E. anterior cruciate ligament and posterolateral ligament reconstruction followed by high tibial osteotomy
- 45. Which of the following factors is a major determinant causing muscle cells to differentiate toward an osteogenic lineage, which consequently improves bone-healing?**
- A. size of the defect
- B. location of the defect
- C. osteogenic stimuli (BMP-2)
- D. scaffold (Helistat)
- E. time postinjury
- 46. In the preoperative discussion about post-operative expectations following interdigital neuroma excision, a patient should be apprised of the fact that:**
- A. a variable sensory deficit may occur in the web space or digits
- B. a plantar approach is the preferable exposure for resection of the primary neuroma
- C. results following neuroma excision deteriorate with time
- D. a patient should be able to wear a shoe of choice postoperatively
- E. residual interspace tenderness is an indication for reexploration for recurrent neuroma
- 47. Extrusion of polymethylmethacrylate into the spinal canal or the neural foramen may complicate vertebroplasty for osteoporotic compression fractures. Which of the following precautions is unlikely to be helpful in preventing this complication?**
- A. adding tungsten or tantalum to the cement to enhance intraoperative fluoroscopic visualization
- B. injecting polymethylmethacrylate in small volume through both pedicles
- C. injecting polymethylmethacrylate in a viscous partially polymerized consistency
- D. using biplanar fluoroscopy or computed tomography for visualization
- E. waiting until six weeks after the acute fracture to allow early bone consolidation
- 48. When conducting outcome studies of total knee arthroplasty, it is essential to collect data on preoperative status. Some study designs, such as cross-sectional and retrospective, do not allow for the collection of preoperative data and may rely on patient recall of preoperative status. Certain sociodemographic and clinical features have been shown to influence patient recall. Which of the following factors has been shown to NOT influence patient recall?**
- A. age
- B. mental health status
- C. gender
- D. educational status
- E. postoperative deterioration of function
- 49. Mixed tumor arising in bone can be differentiated from chondrosarcoma by:**
- A. S-100 staining
- B. squamous metaplasia
- C. intraosseous location
- D. myxoid stroma
- E. chondroid stroma
- 50. The most specific method to diagnose muscle injuries is:**
- A. patient history
- B. physical examination
- C. magnetic resonance imaging
- D. ultrasound
- E. computed tomography
- BONUS QUESTION (optional)**
- 51. The Journal of Bone and Joint Surgery was founded by the American Orthopaedic Association in:**
- A. 1903
- B. 1913
- C. 1923
- D. 1933
- E. 1943

RESPONSE FORM

EXAMINATION EVALUATION

Did the October 2001 CME Review Questions meet these educational objectives*:

1. Provide a broad-based review and update specifically in the areas of orthopaedic research, spine surgery, and knee surgery? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of spine surgery and adult reconstructive knee 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 x143.

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 | 51. A B C D E |

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