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THE JOURNAL OF BONE & JOINT SURGERY

CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

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JULY, AUGUST, SEPTEMBER  
2006

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THE DEADLINE TO SUBMIT YOUR ANSWERS FOR GRADING THIS SET OF QUESTIONS IS JANUARY 15, 2007.

## 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 88-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 \$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 January 15, 2007.**

### 1. What is the rationale for using allograft in conjunction with rhBMP-2 for the treatment of a diaphyseal fracture with residual bone loss?

- A. rhBMP-2-induced bone augments allograft, which serves as a bone filler, to create a larger callus
- B. rhBMP-2 accelerates allograft incorporation into the bone callus through allograft remodeling
- C. in the presence of rhBMP-2, allograft stimulates bone formation
- D. allograft enhances rhBMP-2 osteoinduction by blocking bone remodeling at the site of implantation
- E. allograft stimulates the activity of rhBMP-2, which induces even more new bone formation

### 2. Positive findings of which of the following tests or combinations of tests were found to be the most diagnostic of traumatic anterior instability?

- A. anterior apprehension test
- B. anterior drawer test
- C. relocation test
- D. anterior apprehension test and relocation test
- E. anterior apprehension test, relocation test, and anterior drawer test

### 3. Which of the following is associated with an increase in circulating levels of osteoprotegerin (OPG), the decoy receptor of the receptor activator of nuclear factor- $\kappa$ B ligand (RANKL)?

- A. rheumatoid arthritis
- B. diseases with high bone turnover
- C. gout
- D. total hip arthroplasty
- E. femoral fracture

### 4. In order to obtain a successful outcome after a periacetabular osteotomy for hip dysplasia, it is important to select the right patient and obtain sufficient femoral head coverage without complications. Which of the following preoperative factors is most influential in determining the outcome following osteotomy?

- A. patient age
- B. presence of a labral tear
- C. preexisting osteoarthritis
- D. severity of dysplasia
- E. patient gender

### 5. Critical-sized defect bridging in response to rhBMP-2/ $\alpha$ -BSM involves which of the following sequence of events?

- A. cortical bone formation filling the gap from the ends of the osteotomy site, followed by resorption of  $\alpha$ -BSM and marrow regeneration
- B. trabecular bone formation filling the gap, cortical bone formation, resorption of  $\alpha$ -BSM, followed by resorption of trabecular bone and marrow regeneration
- C. resorption of  $\alpha$ -BSM, marrow regeneration followed by trabecular bone formation and cortical bone formation
- D. resorption of  $\alpha$ -BSM and trabecular bone filling the defect, selective trabecular bone resorption centrally leading to marrow regeneration and

- trabecular bone consolidation peripherally leading to cortical bone formation
- E. resorption of  $\alpha$ -BSM and cortical bone formation filling the gap, selective cortical bone resorption centrally leading to marrow regeneration and corticalization
- 6. Anterior cervical plate fixation commonly accompanies decompression and fusion. Dynamic cervical plates, as opposed to static-locked plates, have been shown to:**
- A. increase cervical fusion rates  
 B. decrease screw back-out rates  
 C. provide little stability to the overall construct  
 D. allow load-sharing in the face of subsidence  
 E. increase the range of motion of the treated segment
- 7. Which of the following assumptions concerning assessment of radial and ulnar torsion profiles with cross-sectional magnetic resonance imaging is correct?**
- A. corrective osteotomies for rotational malalignment of the radius and ulna can be confidently based on side comparison with cross-sectional imaging  
 B. although statistical tests demonstrate good intraobserver and interobserver reliabilities, individual side differences of  $>20^\circ$  in the torsion profile of the radius and ulna are physiologic  
 C. a  $20^\circ$  side difference in the radial torsion profile demonstrated by the Bindra method indicates that a corrective osteotomy of  $20^\circ$  of the radius must be performed  
 D. several methods of torsion profile assessment with cross-sectional imaging are available for the ulna  
 E. blind assessment increases the side-to-side reliability of the Bindra method
- 8. Recent biomechanical studies have shown that the optimal occipital screw placement in surgery at the occipitocervical junction is:**
- A. along the midline where the occipital bone is thickest  
 B. below the inferior nuchal line  
 C. laterally placed to better resist rotational stresses  
 D. a combination of midline and laterally placed screws  
 E. limited to location above the superior nuchal line
- 9. Eccentric training has been advocated as an alternative to surgical treatment for patients with patellar tendinopathy (jumper's knee). Which statement most accurately reflects the results of a randomized, controlled study that evaluated these two treatment options:**
- A. the results after surgical treatment are clearly superior to those after eccentric training  
 B. the results after eccentric training are clearly superior to those after surgical treatment  
 C. the results after eccentric training and surgical treatment are similar  
 D. the results are poor after both types of treatment, and neither should be considered
- E. more than half of all patients treated with open tenotomy experience postoperative complications, and this treatment method should therefore be discontinued
- 10. The incidence and progression of rotator cuff disease is strongly associated with age. In patients older than sixty-six years who present with unilateral pain in the shoulder, the likelihood of finding bilateral rotator cuff tears is:**
- A. 0% to 59%  
 B. 10%  
 C. 30%  
 D. 50%  
 E.  $>75\%$
- 11. Which of the following factors was found to be associated with an increased risk of surgical site infection following orthopaedic surgery in elderly patients?**
- A. an age of more than eighty years old  
 B. widowed or unmarried status  
 C. diabetes mellitus  
 D. residence in a nursing home  
 E. urinary incontinence
- 12. In an experimental flatfoot model, which of the following radiographic parameters showed insignificant differences in comparisons of moderate and severe flatfeet with intact feet?**
- A. talonavicular angle on the anteroposterior radiograph  
 B. lateral talocalcaneal angle  
 C. medial cuneiform height  
 D. lateral talar-first metatarsal angle  
 E. lateral forefoot pressure measurements
- 13. Which of the following parameters of cannulated hip screw insertion was significantly better when computerized navigation was used for internal fixation of femoral neck fractures:**
- A. distance from the lesser trochanter  
 B. screw length measurements  
 C. parallelism and spread of the screws  
 D. femoral head penetration  
 E. distance between outermost screws
- 14. What is the expected time until maximal relief of symptoms when the plantar fascia-specific stretching protocol is utilized for patients with chronic proximal plantar fasciitis?**
- A. four weeks  
 B. eight weeks  
 C. six months  
 D. twelve months  
 E. two years
- 15. Compared with a single-bundle reconstruction of the posterior cruciate ligament, a double-bundle reconstruction demonstrates:**
- A. small decreases in knee laxity with substantial elevation of graft forces  
 B. small decreases in knee laxity with substantial decreases in graft forces

- C. small increases in knee laxity with substantial elevation of graft forces  
 D. small increases in knee laxity with substantial decreases in graft forces  
 E. no substantial differences with regard to knee laxity or graft forces
- 16. Injection of cortisone and lidocaine into the cervical facet joint has been used to treat whiplash pain. Which of the following locations was found to be the most appropriate for the injection in an animal model?**
- A. intra-articular space  
 B. dorsolateral aspect of the capsule  
 C. dorsomedial aspect of the capsule  
 D. dorsocentral aspect of the capsule  
 E. none of them
- 17. In a cohort of 347 patients who underwent lumbar disc arthroplasty, the rate of reoperations was 7.8%. The reasons for the reoperations included all but which of the following?**
- A. persistent pain  
 B. pseudoradicular symptoms  
 C. mechanical low-back pain  
 D. prosthetic failure  
 E. lower-extremity cramping
- 18. After insertion of an osteochondral graft, in which zone does chondrocyte death predominantly occur?**
- A. the superficial zone of the osteochondral graft  
 B. the interior/middle zone of the cartilage  
 C. the deeper zone of the cartilage  
 D. chondrocyte death is evenly distributed through the cartilage  
 E. chondrocyte death does not occur
- 19. Which of the following is the single most important predictor of early instability of a distal radial fracture?**
- A. fracture comminution  
 B. patient age  
 C. energy of the injury  
 D. fracture displacement  
 E. AO/OTA fracture classification
- 20. Following inhalational exposure to bone cement vapors during arthroplasty, serum levels of methylmethacrylate are:**
- A. greater than published industrial safety standards for the first thirty minutes after exposure  
 B. greater than published industrial safety standards for the first twenty minutes after exposure, after which they taper rapidly  
 C. greater than published industrial safety standards as a brief spike and then undetectable at levels above 0.5 part per million  
 D. undetectable at any point after exposure at levels above 0.5 part per million  
 E. detectable at levels between 0.5 and 10 parts per million for the first six hours after exposure
- 21. The United States Surgeon General's report on osteoporosis in November 2004 advised that:**
- A. a fragility fracture should trigger an evaluation for secondary causes of osteoporosis and for drug therapy  
 B. evaluation for osteoporosis is not necessary for a patient who sustains a fragility fracture at an age of less than seventy years  
 C. evaluation and treatment for osteoporosis after a fragility fracture are necessary only for women  
 D. the orthopaedist should be able to treat osteoporosis without the input of other physicians  
 E. osteoporosis is no longer an important health problem
- 22. Which factors are important in determining the cost-effectiveness of unicompartmental knee arthroplasty as an alternative to total knee arthroplasty in patients with unicompartmental arthritis?**
- A. survivorship of unicompartmental implants in comparison with that of total knee prostheses  
 B. the relative functional improvement seen after unicompartmental and total knee arthroplasties  
 C. the relative cost of unicompartmental and total knee arthroplasties  
 D. the age of patients at the time of the initial unicompartmental knee arthroplasty  
 E. all of the above
- 23. Which psychological factor was an independent predictor of upper-extremity-specific health status as measured with the DASH?**
- A. neuroticism  
 B. physiological anxiety  
 C. cognitive anxiety  
 D. fear of pain  
 E. depression
- 24. There is variation in the technique that surgeons use to perform a brachioradialis-to-flexor pollicis longus tendon transfer. In particular, variability in surgical attachment length and different surgical preferences for the position of the patient's limb at the time of tensioning have been reported. The results from a research study suggest that surgeons should:**
- A. choose a surgical attachment length that corresponds to the optimal sarcomere length (2.7  $\mu$ m) whenever possible  
 B. position the patient's limb so that the elbow is fully extended to optimize the surgical tensioning approach  
 C. measure the lateral pinch forces that their patients produce in multiple elbow positions in order to evaluate the relationship between pinch force and elbow position that results from their surgical technique  
 D. perform a deltoid-to-triceps tendon transfer when performing a brachioradialis-to-flexor pollicis longus transfer to ensure that patients have sufficient elbow strength  
 E. set the tension of the transferred brachioradialis slightly tighter than the normal state of the brachioradialis

- 25. Which of the following positions of the knee were found to facilitate maximal load-sharing by the peripatellar retinaculum?**
- full knee extension with external rotation of the tibia
  - full knee extension with internal rotation of the tibia
  - full knee flexion with external rotation of the tibia
  - full knee flexion with internal rotation of the tibia
  - mid-range knee flexion
- 26. The family of a seventy-five-year-old woman who, according to her history, was cognitively intact before falling, says that she seems quieter than normal sixteen hours after open reduction and internal fixation for a hip fracture. Later that day, the patient becomes animated and her family believes that she is back to her normal self. Her nurse calls you at 2 A.M. saying that the patient is calling the nurses' station for help quite frequently and seems disoriented. You suspect delirium. At this time, each of the following would be reasonable initial interventions EXCEPT:**
- asking the nurse to assess the patient's vital signs and oxygenation
  - asking the nurse to reorient the patient and provide environmental stimuli
  - assessing the patient's pain status
  - asking the nurse to give the patient 1 mg of Hal-dol intravenously
  - asking the nurse to obtain a complete blood-cell count with differential, measurement of electrolyte levels, and urinalysis
- 27. In the absence of cauda equina syndrome, the best indication for surgical intervention for lumbar disc herniation is:**
- refractory radicular pain
  - a large extruded disc herniation
  - persistent low-back pain despite conservative treatment
  - stable motor weakness or numbness
  - a history of smoking
- 28. Controversy continues with regard to the treatment of displaced femoral neck fractures in the elderly. A recent prospective, randomized study demonstrated that:**
- hemiarthroplasty has a lower reoperation rate than total hip arthroplasty
  - internal fixation has the lowest complication rate
  - the best functional outcome is attained with total hip arthroplasty
  - the most cost-effective treatment is internal fixation
  - the difference in functional outcome among the treatment groups was no longer significant after twelve months
- 29. In an analysis of the Finnish Arthroplasty Registry, which of the following factors was found to be a positive predictor of longevity of revision total knee arthroplasty?**
- operation performed on the nondominant limb
  - male gender
  - age over seventy years
  - use of Link Endo-Modell implants
  - operation performed in a university hospital
- 30. The highest rate of union with correction of deformity was achieved with which of the following techniques for treatment of nonunion of the humeral shaft?**
- cast immobilization and electrical stimulation
  - external fixation for three months
  - autologous bone-grafting only
  - allogenic bone-grafting only
  - stable open reduction and internal fixation with plate(s) and screws and bone graft
- 31. The beneficial effect of the labral support osteotomy for treatment of Legg-Calvé-Perthes disease is that it:**
- increases acetabular depth
  - increases acetabular height
  - equalizes limb lengths
  - reduces the prevalence of acetabular impingement
  - increases the sphericity of the acetabular dome
- 32. Four years after a left total shoulder replacement, a seventy-year-old woman presents with a three-month history of increasing pain and decreasing range of motion of the shoulder. Surgical treatment of which of the following possible causes of the symptoms is associated with the best outcome?**
- glenoid component loosening
  - infection
  - rotator cuff tear
  - instability secondary to soft-tissue insufficiency
  - failed tuberosity reconstruction
- 33. Which of the following cells have receptors for the receptor activator of nuclear factor- $\kappa$ B ligand (RANKL)?**
- osteoclast precursors
  - osteoblasts
  - osteocytes
  - lymphocytes
  - neutrophils
- 34. Which of the following was the most frequently reported presenting symptom by patients with sacral chordoma?**
- urinary dysfunction
  - a mass
  - sexual dysfunction
  - pain
  - bowel dysfunction
- 35. All but which of the following factors influence the choice of approach (anterior or posterior) for the operative management of cervical spondylotic myelopathy?**
- sagittal alignment of the cervical spinal column
  - number of stenotic segments
  - concomitant cervical radiculopathy
  - prior surgical approach
  - location of compressive pathology

- 36. Which of the following is a major problem with all occipital fixation devices?**
- implant prominence on the occiput
  - inability to contour the plate intraoperatively
  - inability to adjust cervical rod location after plate placement
  - eventual fatigue failure
  - inadequate fixation to the occiput
- 37. When the plantar fascia-specific stretching protocol is used for patients with chronic proximal plantar fasciitis, what is the chance of the patients returning to full activity without limitations and no need for additional treatment?**
- approximately 10%
  - approximately 25%
  - approximately 50%
  - approximately 75%
  - approximately 95%
- 38. The addition of three-dimensional computed tomography reconstruction to standard two-dimensional computed tomography of articular fractures of the distal part of the humerus has the greatest effect on:**
- intraobserver reliability
  - sensitivity
  - specificity
  - accuracy
  - anatomic alignment
- 39. Rupture of the anterior cruciate ligament causes an alteration of cartilage contact mechanics that is most prominently seen at the:**
- superior pole of the patella
  - medial side of the intercondylar notch
  - inferior pole of the patella
  - anterior aspect of the lateral compartment
  - roof of the intercondylar notch
- 40. Advantages of kyphoplasty over vertebroplasty include:**
- lower cost
  - potential for restoration of vertebral body height
  - more rapid rehabilitation
  - improved functional outcome
  - faster procedure
- 41. Which of the following is true about intraoperative fractures that occur during primary total hip arthroplasty?**
- regardless of the initial cup stability, these hips have a very high rate of acetabular component loosening at the time of midterm follow-up
  - fractures are more common in osteopenic, elderly patients treated with a cemented acetabular component
  - no difference in fracture rates have been demonstrated, regardless of acetabular component design
  - elliptical monoblock acetabular components are associated with significantly higher fracture rates than are hemispherical, modular designs
  - acetabular fractures have demonstrated a high rate of nonunion, regardless of cup stability
- 42. Compared with a traditional unlocked construct, a hybrid locking construct used for the treatment of an osteoporotic fracture of the humerus would be expected to be associated with:**
- an increased fracture rate
  - improved preservation of vascularity
  - better maintenance of stiffness of the construct with cyclic loading
  - decreased cost
  - poor purchase in osteoporotic bone
- 43. A recent paper reported that, compared with other surgical exposures, minimal incision surgery with use of two incisions was associated with:**
- less operating time
  - a longer length of hospital stay
  - a lower reoperation rate
  - a higher complication rate
  - a reduced rate of injury to the lateral femoral cutaneous nerve with more experience
- 44. Multiple steps during latissimus dorsi or combined latissimus dorsi and teres major musculoskeletal transfers for treatment of massive rotator cuff defects place local neurologic structures at risk. If both the latissimus dorsi and the teres major are tenotomized directly from the humerus, which of the following most closely represents the distances from the tendon edges to the neurovascular bundles:**
- the thoracodorsal bundle can be found approximately 5 cm axial to the distal end of the latissimus dorsi tendon, and the lower subscapular bundle can be identified approximately 5 cm axial to the distal end of the teres major tendon
  - the thoracodorsal bundle can be found approximately 25 cm axial to the distal end of the latissimus dorsi tendon, and the lower subscapular bundle can be identified approximately 14 cm axial to the distal end of the teres major tendon
  - the thoracodorsal bundle can be found approximately 13 cm axial to the distal end of the latissimus dorsi tendon, and the lower subscapular bundle can be identified approximately 7 cm axial to the distal end of the teres major tendon
  - the lower subscapular bundle can be found approximately 25 cm axial to the distal end of the latissimus dorsi tendon, and the thoracodorsal bundle can be identified approximately 14 cm axial to the distal end of the teres major tendon
  - the lower subscapular bundle can be found approximately 2 cm axial to the distal end of the latissimus dorsi tendon, and the thoracodorsal bundle can be identified approximately 10 cm axial to the distal end of the teres major tendon
- 45. Recurrent laryngeal nerve palsy following anterior operative intervention on the cervical spine has been associated with each of the following except:**
- prolonged retraction of the tracheoesophageal structures

- B. surgical laceration of the nerve  
 C. intraoperative extension positioning of the neck  
 D. postoperative hematoma or edema  
 E. stretch on the intralaryngeal portion of the nerve
- 46. Persistence and progression of osteochondral lesions following reconstruction of the anterior cruciate ligament may be related to:**
- A. normal postoperative three-dimensional cartilage contact mechanics  
 B. a stable ligament reconstruction  
 C. hamstring versus bone-patellar-tendon-bone reconstruction  
 D. abnormal postoperative three-dimensional cartilage contact mechanics  
 E. normal menisci at the time of reconstruction
- 47. Which of the following statements is correct in relation to displaced fatigue fractures of the femoral neck?**
- A. prodromal symptoms are pathognomonic of displaced fractures of the femoral neck  
 B. most patients have prodromal symptoms before displacement occurs  
 C. prodromal symptoms are seldom found in these patients  
 D. in addition to hip, thigh, and groin pain, neurogenic pain in the lower extremity can be suspected to be related to fatigue fracture of the femoral neck  
 E. a diagnosis of fatigue fracture can be made solely on the basis of a physical examination and plain radiographs
- 48. Many factors contribute to the difficulty of successfully treating infected fractures that have been fixed with an internal fixation device. The most important impediment to eradication of the infection is:**
- A. bacterial resistance to antibiotic therapy  
 B. inadequate duration of antibiotic therapy  
 C. inadequate dose of antibiotic  
 D. bacteria forming a complex biofilm on internal fixation devices  
 E. a metallic orthopaedic device causing measurable changes in local cytokine levels and adversely affecting the function of immunocompetent cells
- 49. You recommend lumbar selective nerve-root blocks for a patient with spinal stenosis. The patient asks you if the results will be temporary or long-term. Your most appropriate response is:**
- A. five-year follow-up studies have shown that most patients eventually require operative treatment  
 B. at five years, patients who avoided surgery have the same amount of back pain and neurologic symptoms as they had before any treatment  
 C. while patients with herniated discs do well with injections, stenosis is a degenerative problem and injections do not work well long-term for patients with that diagnosis  
 D. the majority of patients avoid surgery for thirteen to twenty-eight months after receiving blocks, and the majority of those who avoid surgery will continue to avoid surgery for at least five years  
 E. at five years, patients who avoided surgery have the same amount of neurologic symptoms but worse back pain than they had before any treatment
- 50. Which of the following factors has been shown to be associated with an increased risk of recurrence of instability following arthroscopic suture anchor Bankart repair?**
- A. glenoid avulsion fracture  
 B. type of sport  
 C. glenoid compression fracture  
 D. gender  
 E. HAGL lesion
- 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 2006 CME Review Questions meet these educational objectives\*:

1. Provide a broad-based review and update specifically in the areas of hip, knee, 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. 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

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The deadline to submit your answers for grading this set of questions is January 15, 2007.

**QUESTIONS?**

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

**ANSWER KEY**

**Black out the correct answers**

- |               |               |                                   |
|---------------|---------------|-----------------------------------|
| 1. A B C D E  | 18. A B C D E | 35. A B C D E                     |
| 2. A B C D E  | 19. A B C D E | 36. A B C D E                     |
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| 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 | <b>CME Credits Claimed*</b> _____ |

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

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