
THE JOURNAL OF BONE & JOINT SURGERY
CONTINUING MEDICAL EDUCATION

CME

REVIEW QUESTIONS

APRIL, MAY, JUNE
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 April, May, and June issues of the American volume of *The Journal of Bone and Joint Surgery* (Volume 83-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 will be October 15, 2001.**

1. Which of the following variables most strongly affects the strength of an experimental flexor tendon repair during the first six weeks post-operatively?

- A. applied force on the repair during rehabilitation
- B. applied excursion of the repaired tendon during rehabilitation
- C. application of electrical stimulation to the muscles of the repaired tendon
- D. the number of suture strands across the repair site
- E. the duration of immobilization

2. In patients undergoing total hip arthroplasty, epoetin alfa:

- A. has no measurable benefit in reducing the need for transfusion
- B. increases the risk of developing congestive heart failure postoperatively
- C. reduces the need for blood transfusions when given preoperatively
- D. has no role in autologous blood donation programs
- E. causes dangerous postoperative bleeding problems

3. Osteolysis induced by wear particles is a serious problem in joint arthroplasty. Particle-induced bone loss is due to an imbalance between bone resorption by osteoclasts and bone formation by osteoblasts. Which of the following is most affected by wear particles?

- A. osteoblast activity
- B. osteoblast differentiation
- C. osteoclast activity
- D. osteoclast differentiation
- E. osteoclast survival

4. Following unilateral total hip arthroplasty with a press-fit acetabular component, retro-acetabular pelvic bone-mineral density:

- A. increases significantly in the ipsilateral hemipelvis
- B. decreases significantly in the contralateral hemipelvis
- C. does not change significantly in the ipsilateral hemipelvis
- D. increases significantly in the contralateral hemipelvis
- E. decreases significantly in the ipsilateral hemipelvis

5. Which of the following can you anticipate within the first five years after having performed a total hip replacement with a cementless acetabular component in a patient with post-traumatic osteoarthritis:

- A. a prohibitively high incidence of clinically significant (Brooker class-III or IV) heterotopic ossification in patients in whom no postoperative prophylaxis was used
- B. a deep-infection rate that is significantly

- higher than that in patients having a total hip replacement for nontraumatic osteoarthritis
- C. similar radiographic stability but more peri-acetabular radiolucencies than in patients having a total hip replacement for nontraumatic osteoarthritis
- D. a dislocation rate that is significantly higher than that in patients having a total hip replacement for nontraumatic osteoarthritis
- E. an aseptic loosening rate that is significantly higher than that in patients having a total hip replacement for nontraumatic osteoarthritis
- 6. Gaucher disease is an autosomal recessive genetic disorder in which the defect causes:**
- A. a marked decrease in the lysosomal enzymes of the cellular elements in connective tissue
- B. an accumulation of fat in various organs as well as in the subcutaneous tissues
- C. an increased production of neurolemmal tissue surrounding major nerves
- D. an accumulation of glucosylceramide in the reticuloendothelial cells
- E. premature aging of connective tissue and collagen damage
- 7. Neuropathic arthropathy of the elbow is characterized by instability and distortion of the elbow joint. Which of the following is the preferred method of treatment?**
- A. arthrodesis
- B. functional bracing
- C. total elbow arthroplasty
- D. distraction arthroplasty
- E. débridement of the elbow joint and transfer of the ulnar nerve
- 8. Percutaneous volar cannulated screw fixation of nondisplaced scaphoid fractures:**
- A. has a high rate of injury to the radial artery and superficial branch of the radial nerve
- B. is ideal for oblique fracture patterns
- C. leads to a significant incidence of scaphoradial arthritis at two years postoperatively
- D. results in more rapid union of the fracture when compared with cast immobilization
- E. is not recommended because of the high incidence of malunion
- 9. The noninvasive diagnosis of chronic osteomyelitis remains a diagnostic challenge in clinical orthopaedics. White blood-cell scanning is often used to resolve diagnostic problems. Fluorine-18 fluorodeoxyglucose positron emission tomography (FDG-PET) has several advantages when compared with white blood-cell scanning because:**
- A. the patient dose of the diagnostic agent is lower in FDG-PET and the technique is less invasive
- B. FDG-PET is able to distinguish between tumors and bacterial infection
- C. FDG-PET provides more accurate diagnosis in the central skeleton
- D. use of alcohol has no influence on FDG-PET
- E. FDG-PET is readily available and cheaper
- 10. Which of the following implants should not be used to treat reverse obliquity fractures of the intertrochanteric region of the femur?**
- A. 95° angled blade plate
- B. dynamic condylar screw
- C. cephalomedullary nail
- D. sliding hip screw
- E. intramedullary hip screw
- 11. A patient has a leg-length discrepancy of 4 cm. An increase in the electromyographic potentials in the calf muscles of the short leg is most likely due to:**
- A. circumduction of the long leg
- B. hip-hiking of the long leg
- C. steppage gait of the long leg
- D. vaulting of the long leg
- E. vaulting of the short leg
- 12. Which of the following factors is the most important in the loss of the plasma-sprayed hydroxyapatite coating on acetabular cups over time?**
- A. direct dissolution
- B. delamination
- C. osteoclastic degradation
- D. substrate surface texture
- E. prosthetic design
- 13. During transfixion of the distal tibiofibular syndesmosis to repair an injury, restriction of ankle motion is best avoided by placing the ankle joint in:**
- A. plantar flexion and internal rotation
- B. neutral flexion and external rotation
- C. dorsiflexion and internal rotation
- D. dorsiflexion and rotation are not important
- E. any position as long as the syndesmosis is anatomical
- 14. The addition of osteogenic protein-1 (OP-1) to autograft and allograft bone results in a composite graft with osteoinductive properties that are:**
- A. superior to autograft or allograft bone
- B. inferior to autograft or allograft bone
- C. inferior to autograft bone and equivalent to allograft bone
- D. superior to allograft bone but equivalent to autograft bone
- E. severely detrimental to local bone conduction
- 15. All of the following are indications for a single-stage total hip replacement in a patient with a history of septic arthritis except:**
- A. a negative bone biopsy culture
- B. adequate treatment of the infection in the past

- C. infection with *Staphylococcus aureus*
 D. continued elevation of the erythrocyte sedimentation rate and C-reactive protein level
 E. infection with an antibiotic-sensitive streptococcus
- 16. A twenty-four-year-old man sustained an injury of the right knee in a motor-vehicle accident. Physical examination of the knee revealed grade-III posterior instability. A magnetic resonance imaging scan revealed an avulsion fracture of the posterior cruciate ligament from its tibial attachment. The fragment size was approximately 15 mm. Which of the following is not appropriate treatment for this injury?**
- A. multiple suture fixation
 B. wire suture fixation
 C. multiple pin fixation
 D. cannulated screw fixation
 E. excision of the loose bone fragment
- 17. The preferred method for fixation of supracondylar fractures of the humerus in children is:**
- A. single lateral oblique Kirschner wire
 B. double lateral oblique Kirschner wires
 C. medial and lateral crossed Kirschner wires
 D. single medial oblique Kirschner wire
 E. double medial oblique Kirschner wires
- 18. The most critical part of the operative treatment of severely comminuted intra-articular fractures (AO type C3) of the distal end of the radius in determining the final outcome is restoration of:**
- A. the articular surface
 B. the volar tilt of the distal part of the radius
 C. the length of the radius
 D. the radial tilt angle
 E. ulnar variance
- 19. The Dega osteotomy technique can be varied selectively to address different types of acetabular dysplasia by:**
- A. using fibular strut allografts
 B. varying the extent of the inner pelvic cortex that is cut
 C. using osteotomies of different sizes
 D. changing the angle of the osteotomy referable to the medial-lateral plane
 E. always including a femoral osteotomy
- 20. The most common organisms isolated from infected orthopaedic wounds are:**
- A. staphylococci
 B. streptococci
 C. pseudomonas
 D. enterococci
 E. pneumococci
- 21. When performing upper-extremity surgery, positioning the x-ray tube overhead and using the image intensifier as a table rather than positioning the machine in an opposite configuration (x-ray tube near the floor, generating a beam upward toward the image intensifier) results in:**
- A. more radiation exposure to the patient's extremity
 B. more radiation exposure to the surgeon
 C. no change in radiation exposure to either the surgeon or the patient
 D. less radiation exposure to both the surgeon and the patient
 E. damage to the image intensifier due to the preparation solutions
- 22. Effective interventions in the successful treatment of early (stage-I or II) trapezio-metacarpal joint pain and synovitis resulting from generalized increased ligamentous laxity and thumb basal joint instability might include all of the following except:**
- A. thumb metacarpal extension osteotomy
 B. thumb spica splinting
 C. thumb metacarpophalangeal joint fusion in 30° of hyperextension
 D. Eaton-Littler flexor carpi radialis ligament reconstruction
 E. thumb metacarpophalangeal capsulodesis in 30° of flexion
- 23. The presence of osteolysis in the bone around the load-bearing junction of a modular femoral nail is most likely the result of:**
- A. stress concentration resulting in excessive nail-bone interface motion
 B. fretting corrosion between the components
 C. undetected fatigue fracture of the nail
 D. stress protection due to the large size of the nail
 E. a biologic response to excessive reaming when the nail was inserted
- 24. The provision of preemptive, around-the-clock analgesia with controlled-release oxycodone during rehabilitation after knee arthroplasty:**
- A. increases the incidence of opioid-related side effects
 B. accelerates functional recovery
 C. compromises participation in physical therapy
 D. benefits only patients with "mild" pain
 E. extends the length of hospital stays
- 25. Prior to surgical instrumentation for scoliosis, which of the following factors would be an indication for magnetic resonance imaging of the spine?**
- A. juvenile scoliosis
 B. rapidly progressing scoliosis
 C. large-magnitude curves on initial presentation
 D. right-sided curves
 E. scoliosis in males

- 26. The traditional position of immobilization in adduction and internal rotation after dislocation of the shoulder does not work well, often resulting in redislocation. Which of the following findings that are unfavorable to the healing of a Bankart lesion is observed on magnetic resonance imaging with the arm in this traditional position?**
- separation of the labrum from the glenoid
 - anterior shift of the humeral head
 - tightening of the subscapularis muscle
 - laxity in the superior glenohumeral ligament
 - laxity in the tendon of the long head of the biceps
- 27. Partial-thickness defects in mature articular cartilage do not heal spontaneously, and attempts at repair often result in limited integration between the repair tissue and the surrounding cartilage. Following damage to articular cartilage, what is the sequence of events that renders the cartilage matrix mechanically weakened?**
- overhydration and swelling of the cartilage matrix leading to matrix degradation
 - activation of cartilage morphogenetic proteins leading to chondrocyte overproliferation, which weakens the matrix
 - secretion of proteases by macrophages and mesenchymal cells leading to partial degradation of proteoglycan (aggrecan) in the matrix
 - activation of the angiogenesis growth factors, which leads to ingrowth of new blood vessels (neovascularization) of the area, which degrades the matrix
 - activation of the interleukin cascade, which interferes with the synthesis of proteoglycans in the basal layers of the cartilage required for repair
- 28. If 5% of patients who receive treatment A experience an adverse outcome and 10% of those who receive treatment B have an adverse outcome, then how many patients must a surgeon treat with treatment A to prevent one adverse outcome as compared with using treatment B (that is, what is the NNT [the number needed to treat])?**
- five
 - ten
 - fifteen
 - twenty
 - twenty-five
- 29. A thirty-five-year-old man with insulin-dependent diabetes and a history of steroid-dependent asthma complains of a four-month history of progressive back pain. His temperature is 100°F, white blood-cell count is 12,000 cells/mm³, and erythrocyte sedimentation rate is 65 mm/hr. Plain radiographs show a decrease in disc space height at the second and third lumbar levels. At the time of surgery, which of the following tests is most likely to lead to the correct diagnosis?**
- frozen-section histology
 - hematoxylin and eosin stains of permanent histologic sections
 - acid-fast stains of permanent histologic sections
 - culture in agarose broth
 - 10% potassium hydroxide wet-mount preparation and culture in Sabouraud's agar
- 30. Matrix damage and death of chondrocytes following the use of therapeutic lasers in joints are best detected by:**
- confocal microscopy using tunnel assays
 - electron microscopy
 - routine histology
 - standard histologic sections using specific DNA markers
 - tissue culture of chondrocytes harvested from the site of treatment
- 31. Pseudarthrosis remains a significant clinical problem among patients undergoing anterior cervical decompression and reconstruction at multiple levels. Which of the following factors is associated with lower rates of healing in the setting of cigarette smoking?**
- reconstruction with multilevel interbody grafts
 - reconstruction with bridging autogenous strut grafts
 - use of anterior cervical plates
 - postoperative immobilization in a halo vest
 - cessation of smoking prior to surgery
- 32. The primary advantage of arthroscopically assisted mini-open rotator cuff repair in comparison with fully open repair is:**
- glenohumeral arthroscopy permits better visualization of associated intra-articular structures
 - arthroscopic decompression eliminates the need for anterior deltoid detachment as part of the transdeltoid approach
 - the more lateral deltoid split performed in the traditional mini-open approach simplifies repair of massive or large chronic rotator cuff tears
 - mini-open rotator cuff repair permits stronger bone-to-tendon fixation
 - the rotator cuff is more easily mobilized in patients with a massive tear
- 33. The topic of professionalism can and should be included in the training of orthopaedic residents. For such education to be effective, orthopaedists involved in resident training must first accomplish which of the following objectives:**
- receive specialty ethics training themselves
 - adopt a consensus definition of professionalism
 - instill in residents the importance of appropri-

- ate professional behavior
- D. develop a structured didactic curriculum to address professionalism
- E. recruit the support and help of established hospital ethics committees

34. The anterior interosseous nerve at the level of the wrist can be transferred to the ulnar nerve in an effort to restore ulnar nerve function. Transfer of the anterior interosseous nerve at this level would result in:

- A. loss of pronation of the forearm with the need for tendon transfers
- B. no significant functional loss
- C. loss of sensation in the palmar thenar eminence
- D. denervation of the long flexor of the thumb
- E. impaired pinch function between the tips of the thumb and index finger

35. Ischemic necrosis of the capital femoral epiphysis produces which of the following in the growth plate cartilage surrounding the secondary center of ossification?

- A. no change
- B. increased thickness of the growth plate cartilage
- C. necrosis of the growth plate cartilage
- D. increased endochondral ossification
- E. transient loss of the glycosaminoglycans

36. In patients with diabetes mellitus and edema with foot ulcers requiring débridement, intermittent pneumatic foot compression:

- A. promotes wound-healing after débridement
- B. causes increased pedal edema
- C. is an effective substitute for surgical débridement
- D. delays healing of the ulcers
- E. is the most cost-effective treatment method

37. Which of the following factors is most predictive of curve progression in adolescent idiopathic scoliosis?

- A. peak height velocity
- B. menarchal status
- C. Risser sign
- D. arm span/height ratio
- E. gender

38. What is the best position for immobilization of the hand after internal fixation of metacarpal and phalangeal fractures?

Wrist	Metacarpophalangeal Joints	Interphalangeal Joints
A. 45° extension	80° flexion	Neutral
B. 20° extension	70° flexion	10° flexion
C. Neutral	60° flexion	20° flexion
D. 20° flexion	45° flexion	45° flexion
E. 30° flexion	Full extension	80° flexion

39. Which one of the following statements is most correct with regard to the use of e-mail for communication with patients?

- A. informed consent is necessary prior to communicating with a patient via e-mail
- B. the marginal cost of using e-mail for patient communication is extremely high
- C. electronically deleted messages are recoverable and legally discoverable
- D. printed electronic messages between physicians and patients cannot be attached to a patient's chart
- E. urgent complaints that could be serious, transmitted by the patient to the physician, are best responded to by immediate return e-mail

40. Median nerve paresthesia following repair of a rupture of the distal biceps is less likely when the tendon is:

- A. passed radial (lateral) to the median nerve
- B. passed between the ulnar and median nerves
- C. passed percutaneously directly through a drill-hole in the biceps tubercle of the radius
- D. split and passed around both sides of the median nerve
- E. inserted into the coronoid process

41. Primary hyperparathyroidism may lead to skeletal changes that affect the cervical spine. These changes may include all of the following except:

- A. marked bone resorption leading to microfractures and mechanical instability of the cervical spine
- B. generalized osteoporosis of the spine
- C. fibrous tissue proliferation in visible bone cysts
- D. demineralization of bone due to the increased activation of osteoclasts in the presence of a low serum calcium level
- E. development of evidence of focal hemorrhage

42. Gait-related forces pass from the hindfoot to the forefoot through the tarsometatarsal joints. Long-lived performance of these joints is believed to depend upon normal functioning of pressure-regulating mechanisms in these joints. These pressures are probably regulated by:

- A. one mechanism that operates at both high and low loads
- B. one mechanism that operates at high loads only and thereby prevents overloading
- C. both intrajoint and interjoint mechanisms that operate equally well at both small and large loads
- D. an intrajoint mechanism for small loads and an interjoint mechanism for large loads
- E. an interjoint mechanism for small loads and an intrajoint mechanism for large loads

- 43. Deep-vein thrombosis of the proximal and distal veins of the lower extremity is a common complication following total knee arthroplasty. Which of the following statements best describes the comparative efficacy of enoxaparin and warfarin?**
- enoxaparin is significantly more effective than warfarin in preventing distal deep-vein thrombosis only when administered within eight hours of surgery
 - enoxaparin is significantly more effective than warfarin in preventing both proximal and distal deep-vein thrombosis when administered within eight hours of surgery
 - warfarin is significantly more effective than enoxaparin in preventing both proximal and distal deep-vein thrombosis
 - warfarin causes more hemorrhagic complications than does enoxaparin
 - enoxaparin and warfarin are equally effective in preventing lower-extremity deep-vein thrombosis
- 44. Which of the following most accurately describes the “intention to treat” principle used in randomized trials?**
- patients’ outcomes are analyzed according to the treatment they received
 - patients’ outcomes are analyzed in the groups to which they were initially randomized
 - patients’ outcomes are analyzed with the exclusion of those who were noncompliant
 - patients’ outcomes are analyzed by “intentionally” excluding the best and worst outcomes in each group to eliminate outliers
 - the “intention to treat” principle is unethical and should not be used in clinical studies
- 45. Which of the following is not a correct indication for shoulder arthrodesis?**
- chronic infection of the glenohumeral joint
 - loss of function of the deltoid and rotator cuff muscles
 - post-traumatic brachial plexus injury
 - paralysis of the scapular stabilizing muscles
 - severe refractory instability of the glenohumeral joint
- 46. The most common mechanism of liner dislodgment in Harris-Galante acetabular components in total hip arthroplasty is:**
- violent trauma, imposing shear stress on the liner
 - repetitive impacts, such as those imposed during running and during sports such as basketball
 - progressive motion, wear, and deformation of the liner
 - loosening of the metal shell and osteolysis
 - varus and retroversion of a loose femoral component
- 47. Shoulders with asymmetrical wear of the glenoid with associated glenohumeral instability are best stabilized at the time of total shoulder arthroplasty by:**
- a constrained prosthesis
 - anterior and posterior capsular shifts
 - a bone graft on the glenoid
 - compensatory positioning of the humeral prosthesis
 - osteotomy of either the glenoid or the humerus, depending on the type of instability
- 48. Of the choices listed, the most optimal position for arthrodesis of the shoulder is:**
- forward flexion 40°, abduction 30°, internal rotation 40°
 - forward flexion 30°, abduction 40°, internal rotation 15°
 - forward flexion 15°, abduction 10°, internal rotation 40°
 - forward flexion 15°, abduction 40°, internal rotation 15°
 - forward flexion 25°, abduction 30°, internal rotation 10°
- 49. In patients with low-back pain or sciatica, bed rest:**
- is the best way to relieve pain
 - leads most quickly to a return to normal function
 - is no substitute for administration of anti-inflammatory medications
 - can be more effective than treatment with a back brace
 - does not relieve pain better than maintenance of activity
- 50. More than a screening physical examination (such as hip radiographs or hip ultrasound) is indicated for assessment of a healthy newborn for developmental dysplasia of the hip in which of the following situations?**
- male child with a history of breech presentation
 - female child with a history of breech presentation
 - male child with a family history of developmental dysplasia of the hip
 - female child with a family history of developmental dysplasia of the hip
 - female child with no history of developmental dysplasia of the hip
- BONUS QUESTION (optional)**
- 51. The slogan that provides the essential overlying theme of JBJS activity is:**
- Scientific Publishing is Essential
 - We are Always Right
 - Excellence Through Peer Review
 - All Articles Should be Published
 - Publish Only from Academic Centers
 - Examination Evaluation

RESPONSE FORM

EXAMINATION EVALUATION

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

1. Provide a broad-based review and update specifically in the areas of musculoskeletal tumors, foot and ankle surgery, and pediatric orthopaedics? Yes No
2. Strengthen your problem-solving abilities related to patient care particularly in the areas of pediatric orthopaedics, musculoskeletal tumors, and foot and ankle care? 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?

<input type="checkbox"/> Commercial advertising	<input type="checkbox"/> Current Concepts
<input type="checkbox"/> Classified advertising	<input type="checkbox"/> Letters to The Editor
<input type="checkbox"/> Clinical scientific articles	<input type="checkbox"/> Basic scientific articles
<input type="checkbox"/> Orthopaedic Forum	<input type="checkbox"/> 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 |
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| 3. A B C D E | 20. A B C D E | 37. A B C D E |
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| 9. A B C D E | 26. A B C D E | 43. A B C D E |
| 10. A B C D E | 27. A B C D E | 44. A B C D E |
| 11. A B C D E | 28. A B C D E | 45. A B C D E |
| 12. A B C D E | 29. A B C D E | 46. A B C D E |
| 13. A B C D E | 30. A B C D E | 47. A B C D E |
| 14. A B C D E | 31. A B C D E | 48. A B C D E |
| 15. A B C D E | 32. A B C D E | 49. A B C D E |
| 16. A B C D E | 33. A B C D E | 50. A B C D E |
| 17. A B C D E | 34. A B C D E | 51. A B C D E F |

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