THE JOURNAL of the AMERICAN OSTEOPATHIC ASSOCIATION

The purpose of this quiz is to provide a convenient means for osteopathic physicians to assess their understanding of the scientific content in the July 2014 issue of *The Journal of the American Osteopathic Association* (*JAOA*).

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Alternatively, osteopathic physicians can complete the quiz below and mail it to the following address by January 31, 2016:

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For each of the questions below, place a checkmark in the box provided next to your answer so that you can easily verify your answers against the correct answers, which will be published in the August 2014 issue of the *JAOA*.

Association Between Cervical and Thoracic Somatic Dysfunction Among Second-Year Osteopathic Medical Students

Joseph P. Brindise, DO; Kenneth E. Nelson, DO; and Robert E. Kappler, DO

1. Which of the following mediates has been suggested to link cervical somatic dysfunction and thoracic somatic dysfunction:

- ☐ (a) the sympathetic nervous system
- ☐ (b) the parasympathetic nervous system
- ☐ (c) both the sympathetic and the parasympathetic nervous systems
- ☐ (d) neither the sympathetic nor the parasympathetic nervous system

2. The nuchal ligament is composed of which of the following aponeuroses:

- ☐ (a) trapezius
- ☐ (b) rhomboideus minor
- ☐ (c) serratus posterior superior
- ☐ (d) splenius capitis
- ☐ (e) all of the above

Mountaineering-Induced Bilateral Plantar Paresthesia

Kyle K. Henderson, PhD; Justine Parker, DO; and Kurt P. Heinking, DO

3. A 43-year-old hiker complains of numbness of the distal aspect of his toes after completing a 6-hour trail. He states that he recently purchased new hiking boots and feels that they may be too stiff. On physical examination, a flat arch and navicular somatic dysfunction are diagnosed. On applying a Tinel test over the tarsal tunnel, he develops paresthesias into his toes. The rest of the neurologic examination of his legs is normal. The patient's condition is best diagnosed as which of the following:

- ☐ (a) common peroneal nerve entrapment
- ☐ (b) tarsal tunnel syndrome
- ☐ (c) diabetic neuropathy
- ☐ (d) Morton neuroma
- ☐ (e) plantar fasciitis

4. A 29-year-old marathon runner develops arch pain of her right foot about two-thirds of the way through her race. She stops to see you in the medical tent. On physical examination, she exhibits high arched feet and scores positive on the ankle drawer test. She denies pain or numbness into the toes. Her metatarsal squeeze test result is negative for pain. On standing her right arch drops down more than the left. There is no pain to vibration or percussion of the other bones of her foot. Having a high arch and stiff forefoot with an unstable ankle may lead her to have an increased incidence of which of the following conditions:

- ☐ (a) exercise-induced plantar paresthesia
- ☐ (b) Morton foot
- ☐ (c) ankle sprains and fractures of the fifth metatarsal
- ☐ (d) plantar fasciitis
- ☐ (e) calcaneus stress fracture

Management of Ionizing Radiation Injuries and Illnesses, Part 3: Radiobiology and Health Effects of Ionizing Radiation

Doran M. Christensen, DO; Gordon K. Livingston, PhD; Stephen L. Sugarman, MS; Steven J. Parillo, DO; and Erik S. Glassman, EMT-P, MS

5. What is the primary mechanism of x-ray damage to DNA?

- ☐ (a) neutron activation
- ☐ (b) hydroxyl radicals
- ☐ (c) acetylcholinesterase inhibition
- ☐ (d) endotoxin secretion

6. What is the mechanism of dicentric chromosome formation?
- ☐ (a) inappropriate division of chromosomes during an interrupted metaphase
- ☐ (b) inappropriate division of hematopoietic progenitor cells
- ☐ (c) apoptosis, leading to a symmetrical exchange of messenger RNA in the cell repair process
- ☐ (d) asymmetric exchange of DNA after DNA double-strand breaks

Primary Care Evaluation and Treatment of Men With Lower Urinary Tract Symptoms

Nathan Hale, DO; Kellen Choi, DO; and Joshua Lohri, DO

7. Which of the following genitourinary findings should prompt urologic referral in patients with lower urinary tract symptoms:
- ☐ (a) prostate nodule
- ☐ (b) elevated serum prostate-specific antigen
- ☐ (c) gross hematuria
- ☐ (d) all of the above

8. Which of the following is not part of the initial evaluation of men with lower urinary tract symptoms:
- ☐ (a) urinalysis
- ☐ (b) cystoscopy
- ☐ (c) history and physical examination
- ☐ (d) voiding diary

9. Which of the following is the mechanism of action of mirabegron:
- ☐ (a) It inhibits α_1-adrenergic receptors.
- ☐ (b) It blocks conversion of testosterone to dihydrotestosterone.
- ☐ (c) It activates β_3-adrenergic receptors.
- ☐ (d) It inhibits muscarinic cholinergic receptors.

Perception-Based Effects of Clinical Exposure to Osteopathic Manipulative Treatment on First- and Second-Year Osteopathic Medical Students

Kathleen M. Vazzana, OMS IV; Sheldon C. Yao, DO; Min-Kyung Jung, PhD; and Michael J. Terzella, DO

10. The positive responses to the statement “I plan to use OMT in my future clinical practice”...
- ☐ (a) decreased as the number of clinical shadowing exposures increased
- ☐ (b) decreased as the number of clinical shadowing exposures remained the same
- ☐ (c) increased as the number of clinical shadowing exposures increased
- ☐ (d) increased as the number of clinical shadowing exposures decreased
- ☐ (e) remained constant as the number of clinical shadowing exposures increased

Osteopathic Musculoskeletal Examination and Subarachnoid Anesthetic Administration in a Patient With Severe Scoliosis

James J. Lamberg, DO; Sanjib D. Adhikary, MB; and Andrew T. McFadden, DO

11. Spines of patients with scoliosis typically follow which of the following principles of spinal mechanics:
- ☐ (a) When the spine is neutral, sidebending will rotate the spine toward the side of concavity.
- ☐ (b) When the spine is neutral, sidebending will rotate the spine toward the side of convexity.
- ☐ (c) When the spine is flexed or extended, sidebending will rotate the spine toward the side of concavity.
- ☐ (d) When the spine is flexed or extended, sidebending will rotate the spine toward the side of convexity.

12. Anatomical changes to the spine seen in patients with scoliosis include which of the following:
- ☐ (a) narrower vertebral canal and thinner pedicles on the concave side and spinous process deviated toward the side of concavity
- ☐ (b) narrower vertebral canal and thinner pedicles on the concave side and spinous process deviated toward the side of convexity
- ☐ (c) narrower vertebral canal and thinner pedicles on the convex side and spinous process deviated toward the side of concavity
- ☐ (d) narrower vertebral canal and thinner pedicles on the convex side and spinous process deviated toward the side of convexity

13. A patient with moderate to severe dextroscoliosis and a glioblastoma presents for intrathecal methotrexate injection. The clinician performs a palpatory examination of the back and locates the L2-3 space. Palpation of the soft tissue at the transverse processes is used to determine the approximate vertebral rotation at this level. Which of the following needle angles would most likely achieve successful subarachnoid anesthesia in this patient:
- ☐ (a) a direct path perpendicular from the plane of the back in the apparent midline
- ☐ (b) a direct path perpendicular from the palpated transverse processes
- ☐ (c) a path slightly lateral to a path perpendicular from the palpated transverse processes, toward the side convexity
- ☐ (d) a path slightly medial to a path perpendicular from the palpated transverse processes, toward the side of concavity

Answers to June 2014 *JAOA* CME Quiz

Discussion answers to *JAOA* continuing medical education quizzes appear only when authors have included discussions with the quiz questions and answers they must provide to meet the requirement for submission to and publication in the *JAOA*.

Effect of Osteopathic Manipulative Treatment on Middle Ear Effusion Following Acute Otitis Media in Young Children: A Pilot Study

Karen M. Steele, DO; Jane E. Carreiro, DO; Judith Haug Viola, DO; Josephine A. Conte, DO; and Lance C. Ridpath, MS

1. (b) Acoustic reflectometry measures the ability of the tympanic membrane to reflect sound. The other procedures function as follows: tympanometry measures the ability of the tympanic membrane to vibrate at different pressures; pneumatic otoscopy measures the ability of the tympanic membrane to move in response to a puff of air; tympanocentesis is the controlled perforation of the tympanic membrane in order to obtain some middle ear fluid for culture; and audiologic evaluation tests hearing ability.
2. (d) Children in the standard care plus osteopathic manipulative treatment group had statistically significant improvement in tympanogram findings after receiving the treatment protocol for 3 weekly visits.

Osteopathic Manipulative Treatment for Inpatients With Pulmonary Exacerbations of Cystic Fibrosis: Effects on Spirometry Findings and Patient Assessments of Breathing, Anxiety, and Pain

David A. Swender, DO; Gina Thompson, DO; Kristen Schneider, DO; Karen McCoy, MD; and Alpa Patel, MD

3. (c) Osteopathic manipulative treatment has been shown to worsen air trapping in patients with chronic obstructive pulmonary disease.
4. (d) In patients admitted for pulmonary exacerbations of cystic fibrosis, more participants who received osteopathic manipulative treatment reported improved breathing quality than those who received sham therapy only.

Assessing Palpation Thresholds of Osteopathic Medical Students Using Static Models of the Lumbar Spine

Eric J. Snider, DO; Kenneth Pamperin, MS; Jane C. Johnson, MA; Natalie R. Shurtz, MHA; and Brian F. Degenhardt, DO

5. (b) When educating osteopathic medical students in manual skills, static lumbar models can be used to provide immediate objective feedback.
6. (c) For uncovered and covered block transverse process models with a 1-mm magnitude of asymmetry, students were able to identify the direction of asymmetry of the transverse processes with a threshold of 80%.
7. (d) For the covered lumbar spine models, students correctly identified the direction of asymmetry with an 80% threshold at 4 mm of asymmetry.

Predictive Relationship of Osteopathic Manual Medicine Grades and COMLEX-USA Level 1 Total Scores and Osteopathic Principles and Practice Subscores

Drew D. Lewis, DO; Mary T. Johnson, PhD; and Edward. P. Finnerty, PhD

8. (e) The second-year written examination grade was found to most closely correlate with Comprehensive Osteopathic Medical Licensing Examination-USA (COMLEX-USA) Level 1 osteopathic principles and practice (OPP) subscores.
9. (d) A written examination score of ⩽70% correlated with a COMLEX-USA Level 1 OPP subscore of ⩽400.
10. (c) The temporal relationship with preparation for both the second-year written examination and COMLEX-USA Level 1 was the rationale given by Lewis et al for why the second-year written examination grades showed the strongest association with the COMLEX-USA Level 1 total score and OPP subscores.

Effectiveness of Osteopathic Manipulative Therapy for Managing Symptoms of Irritable Bowel Syndrome: A Systematic Review

Axel Müller, DO (Germany), MSc; Helge Franke, DO (Germany), MSc; Karl-Ludwig Resch, MD, PhD; and Gary Fryer, PhD, BSc

11. (e) All of the following statements are true about irritable bowel syndrome: it is a chronic, recurring, and often lifelong persistent gastrointestinal illness; it can vary in its symptoms and characteristics; it is a functional disorder that has no known organic cause; and it has no known cure and treatment is directed at relieving symptoms.
12. (c) The systematic review by Müller et al used methods recommended by the Cochrane Collaboration and thus searched for randomized controlled trials that included unpublished studies from the “gray” literature.
13. (e) The systematic review by Müller et al found all of the following results: all included studies reported improvement of irritable bowel syndrome symptoms after osteopathic manipulative therapy; most studies had relatively small sample sizes; the osteopathic manipulative therapy techniques varied between the studies; and there was marked heterogeneity between the studies for the primary outcome parameters, preventing a meta-analysis.

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