

NAME _____

STUDENT ID# _____

November 26, 2003, MS-II Final Written Examination, Version 2
Fall Semester 2003-04

Each of the following questions has only one best answer. Mark the best selection on your Scantron sheet.

A 66-year-old man was admitted to the hospital with a diagnosis of congestive heart failure. You have been asked to do a structural evaluation on this patient and provide appropriate osteopathic manipulative treatment (OMT) while he is in the hospital. Your structural examination findings are hypertonic suboccipital musculature bilaterally, OA R_RS_L, AA R_L, C4-5 ER_RS_R, left sternoclavicular restriction, ribs 1-4 show inhalation restriction on the left, T2-6 NR_LS_R, T11-L3 NR_RS_L, and left-on-left sacral torsion. The following two (2) questions relate to this scenario.

1. For this patient, treatment of which area would have the greatest effect on renal function?

- a. O-A
- b. C3-5
- c. T2-4
- d. T10-12
- e. L4-5

2. For this patient, which should you do prior to instituting lymphatic pump treatments?

- a. CV-4
- b. treat thoracic inlet
- c. liver pump
- d. HVLA to the mid-thoracic spine
- e. cervical HVLA

3. A 55-year-old male comes into the clinic with a 6-day history of productive cough, sputum is green to brown in color, slight fever, chest pain with coughing, fatigue and nagging body aches. There is a 20 year history of smoking. Chest x-rays (AP/Lateral) are negative. You choose to use slow rib raising as part of your treatment. Which one of the following is thought to occur with this technique?

- a. it facilitates lymphatic drainage
- b. it may facilitate parasympathetic activity
- c. it may facilitate segmental sympathetic activity
- d. it may inhibit parasympathetic activity
- e. it may inhibit segmental sympathetic activity

8. A 38-year-old female has COPD and thoracic vertebral and rib somatic dysfunctions. Which of the following is the appropriate order of applying OMT for her condition?

- a. muscle energy for rib respiratory dysfunction, articulate ribs, HVLA to vertebral somatic dysfunction, functional rib OMT
- b. articulate ribs, vertebral muscle energy, functional rib OMT, muscle energy for rib respiratory somatic dysfunction
- c. vertebral muscle energy, articulate ribs, muscle energy for rib respiratory dysfunction, functional rib OMT
- d. vertebral HVLA, muscle energy for rib respiratory dysfunction, articulate ribs, functional rib OMT
- e. functional rib OMT, vertebral HVLA, muscle energy for respiratory rib somatic dysfunction, articulate ribs

9. A 42-year-old female has chronic renal failure. Where would you most likely find viscerosomatic reflex somatic dysfunction?

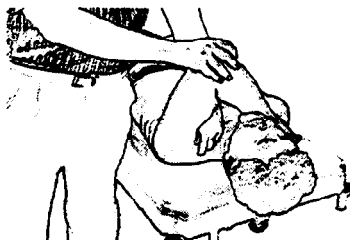
- a. C3-5
- b. T1-4
- c. T5-9
- d. T10-L1
- e. S2-4

10. A 2001 study by **Mnabbi, et. al.**, demonstrated which of the following?

- a. palpatory findings associated with tissue texture change are also correlated with blood glucose levels
- b. palpatory findings associated with tissue texture change are also correlated with changes in transverse carpal ligament length
- c. palpatory findings associated with tissue texture change are also correlated reductions in use of post-operative morphine
- d. palpatory findings associated with tissue texture change are also correlated with increases in nausea and vomiting
- e. palpatory findings associated with tissue texture change are also correlated with decreases in scoliotic curvature

11. The following picture depicts the treatment of a particular diagnosis with the Still Technique. Which muscles are primarily being targeted?

- a. upper traps
- b. middle traps
- c. scalenes
- d. pectoralis minor
- e. supraspinatus



A 62-year-old man was admitted to the hospital with a diagnosis of acute myocardial infarction. You are asked to do a structural evaluation and provide appropriate osteopathic manipulative treatment (OMT) for this patient.

Structural findings: OA FS_LR_R, AA rotated left, left first rib in an inhalation position. T1 ER_LS_L T2-4 NS_RR_L with tissue texture abnormalities in paraspinal soft tissues along T2-4 left, inclusive of the rib angles. T7-10 NS_LR_R. Diaphragm motion restriction on the left with ribs 7-10 exhalation restriction (inhalation somatic dysfunction). **The following three (3) questions relate to this scenario.**

15. In this patient, inhibitory treatment of which area would be most likely to decrease excessive sympathetic tone to the heart?

- a. OA
- b. C3-5
- c. T2-4
- d. T10-12
- e. L4-5

16. In this patient, treatment of which area would have the greatest effect on vagal tone?

- a. OA
- b. C3-5
- c. T2-4
- d. T10-12
- e. sacroiliac

17. OMT may be useful in this patient because it can _____.

- a. stop an acute myocardial infarction
- b. determine the level of cardiac enzymes
- c. prevent brain death
- d. help to differentiate cardiac vs. non-cardiac chest pain
- e. confirm EKG findings

18. Which of the following researchers is characterized by research performed on animals in which the spine was experimentally lesioned and then the cardiovascular, gastrointestinal, reproductive, pulmonary and renal system organs were examined for alterations in their anatomy and function?

- a. J. S. Denslow
- b. I. M. Korr
- c. C. L. Burns
- d. J. N. Eble
- e. J. M. Cox

Wrong

22. A 56-year-old male with an acute myocardial infarction is admitted to the ICU. Where will you most likely find viscerosomatic somatic dysfunction?
- a. C3-5
 - b. T1-4
 - c. T5-9
 - d. T10-L1
 - e. S2-4
23. A patient presents to your clinic with mild productive cough, some fatigue, and runny nose. During the history, he mentions the odd habit of rubbing his thigh which started after a distal transverse colon polypectomy one year ago. Thinking of Chapman's Reflexes, you tell him the specific location and he is astounded. Which of the following was the correct location?
- a. anterolateral aspect of the distal left thigh
 - b. anterolateral aspect of the mid left thigh
 - c. anterolateral aspect of the proximal left thigh
 - d. between the left greater trochanter and the ASIS
 - e. one inch lateral to the 2½ inches above the umbilicus
24. In the above case, the description of a positive or present Chapman's Reflex point would be more accurately described as which one of the following?
- ~~a.~~ a large discreet area of firm tissue
 - b. a small discreet area of soft, circular tissue
 - c. a firm discreet stringy tissue of varying length
 - ~~d.~~ a small round pea-sized lymphoid mass
 - ~~e.~~ a large, vague area of tenderness
25. What are normal AROM(s) for shoulder flexion and shoulder abduction?
- a. 180°, 160°
 - ~~b.~~ 160°, 180°
 - ~~c.~~ 170°, 170°
 - ~~d.~~ 160°
 - e. 180°
26. In a patient with pneumonia, diaphragmatic excursions can be improved by treatment of which of the following body regions?
- ~~a.~~ lower extremities
 - ~~b.~~ upper extremities
 - ~~c.~~ upper thoracic spinal segments
 - d. upper rib cage
 - e. thoracolumbar region

On routine osteopathic structural exam of a 45-year-old male with no complaints, you find that soft tissues overlying T2 costovertebral joints and overlying the left second rib angle both immediately tighten, or bind, upon passive tilting of the head. Segments above and below respond in an opposite manner. The following two (2) questions relate to this scenario:

31. Which of the following do you suspect?

- a. somatovisceral reflex
- b. somatosomatic reflex
- c. viscerosomatic reflex
- d. viscerovisceral reflex
- e. vertebrocostal reflex

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— T2 — 6
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32. Which organ is most likely involved?

- a. liver
- b. thyroid
- c. heart
- d. trachea
- e. stomach

33. In the hospitalized patient, where will you generally find significant areas of somatic dysfunction?

- a. C5-6 on the right
- b. T5-9 for anemia
- c. T10-T12 for stomach ulcer disease
- d. transitional areas of the spine
- e. T1-T5 for gall bladder disease

34. A 19-year-old female has been developing a thoracolumbar scoliosis since age 10. On physical exam, you find she has a short leg and no sacral or iliac somatic dysfunction. Postural x-rays reveal an 8mm unleveling of the sacral base lower on the left. Which of the following would be appropriate initial treatment?

- a. OMT to lengthen the short leg
- b. 2mm left heel lift
- c. 4mm left heel lift
- d. 6mm left heel lift
- e. 8mm left heel lift

10. A 28-year-old female comes into the clinic with a 6-day history of cough, slight fever, clear nasal discharge, fatigue, slight headache, sore throat, tenderness over the frontal and maxillary sinuses, and body aches. There is a history of smoking. If using Chapman's Reflexes to affect sinus drainage, where would be the appropriate location to assess and treat?

a. on the superior aspect of the clavicles, just lateral to where the 1st rib travels underneath it

b. approximately 3 1/2 inches lateral to the sternum and on the superior aspect of the 2nd ribs

c. in the 2nd interspace next to the sternum

d. in the 3rd interspace next to the sternum

e. in the 4th interspace next to the sternum

11. In a 68-year-old female, which of the following conditions is a **CONTRAINDICATION** to HVLA OMT?

a. 15-year smoking history

b. central obesity with BMI >40

c. dyspnea on exertion

d. prolonged corticosteroid use

e. history of asthma

12. A 28-year-old female in her first trimester of pregnancy complains of low back pain. She has a 12mm right short leg from a poorly healed fracture as a child, but no lumbar scoliosis. She has never used an orthotic device. Two osteopathic manipulative treatments have not helped. Which would be an appropriate initial right heel left?

a. 3mm

b. 5mm

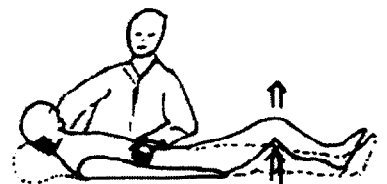
c. 7mm

d. 9mm

e. 11mm

13. A 34-year-old female presents to the emergency room (ER) with a chief complaint of severe headache that began several hours earlier associated with nausea, vomiting, and photophobia. Her temperature is 40°C (oral). There is evidence of cervical spine somatic dysfunction characterized by nuchal rigidity and muscle hypertonus. The maneuver shown in the figure is performed. What is the name of the maneuver and what is the likely diagnosis?

- a. Battle's sign, subarachnoid hemorrhage (SAH)
 b. Kernig's sign, occult basilar skull fracture
 c. Brudzinski's sign, meningitis
 d. Battle's sign, subdural hemorrhage (SDH)
 e. Chiari sign, severe migraine headache



47. Studies by Deyo, Rozenberg, Atlas and Hagen suggest that which of the following is the optimum duration of bed rest for patients with acute back pain?
- a. 2 days
 - b. 5 days
 - c. 8 days
 - d. 2 weeks
 - e. 7 days
48. A 24-year-old female has a history of asthma as a child. On osteopathic structural exam, you would expect to find viscerosomatic dysfunction between which of the following?
- a. C6-T1
 - b. T2-4
 - c. T5-7
 - d. T8-10
 - e. T11-L1
49. A 60-year-old male was hit while walking across the street by a pick up truck and sustained a whiplash type neck injury 2 weeks ago. He still has neck pain, worse when he drives, sits and types, and thus he cannot work. He has a history of a short leg and has an obvious lumbar and thoracic scoliosis, but no previous neck pain. Which of the following statements is true regarding this patient?
- a. His scoliosis is the cause of his neck pain.
 - b. Only his neck needs assessment and treatment.
 - c. Previous Hx can exacerbate his condition and needs to be addressed.
 - d. Cervical facet joints are not a likely source of his neck pain.
 - e. This is an insignificant injury and will improve over time without care.
50. Given the "whole body" examination approach espoused by the osteopathic medical philosophy, if your patient presents with "numbness" and "parasthesias" in his left upper extremity, without evidence of trauma, how would you proceed to localize where the possible dysfunction resided?
- a. x-ray the left upper extremity
 - b. examine the proximal and distal joints
 - c. evaluate for a "flick" sign
 - d. perform Apley's maneuver
 - e. perform a Tinel's maneuver at the elbow but not the wrist

A 52-year-old man was admitted to the hospital with severe chest pain. After stabilization and diagnostic studies, he was taken to surgery where a sternotomy and a four-vessel bypass surgery using mammary artery and saphenous vein auto grafts were performed. Postoperative course was uneventful other than persistent chest pain. You have been asked to do a structural evaluation and provide appropriate osteopathic manipulative treatment (OMT) for this patient. You note the following structural findings: T1-T4 left-sided tissue texture changes, ribs 3-5 on the left exhibit inhalation dysfunction, diaphragm excursion is decreased and thoracoabdominal fascias prefer right rotation and right sidebending, left sternal half of the chest is 3mm anterior to the right sternal half shoulders are drawn up towards ears, scalene muscles are tight bilaterally and firm to touch, the thoracic inlet is rotated to the right, OA is $FR_R S_L$. **The following three (3) questions relate to this scenario.**

44. Which of the following techniques would be **CONTRAINDICATED** in the manipulative treatment of the patient who has just had a median sternotomy incision?
- a. indirect myofascial release of cervicothoracic junction
 - b. fascial treatment of the lower extremity
 - c. rib raising
 - d. classic thoracic lymphatic pump
 - e. occipitoatlantal suboccipital release
45. Which of the following manipulative techniques is the most appropriate technique for treating the cause of the bi-basilar crackles?
- a. rib raising
 - b. occipitoatlantal suboccipital release
 - c. thoracic lymphatic pump
 - d. indirect balancing of the sternum
 - e. paraspinal inhibitory soft tissue technique
46. The patient is found to have marked external rotation of the left leg. What is a probable and reasonable explanation for this finding?
- a. backward sacral torsion as a manifestation of a viscerosomatic reflex
 - b. prolonged positioning during surgery to harvest the saphenous vein
 - c. fascial tension in the thorax
 - d. increased fascial pull from the right hemidiaphragm
 - e. adductor spasm on the left

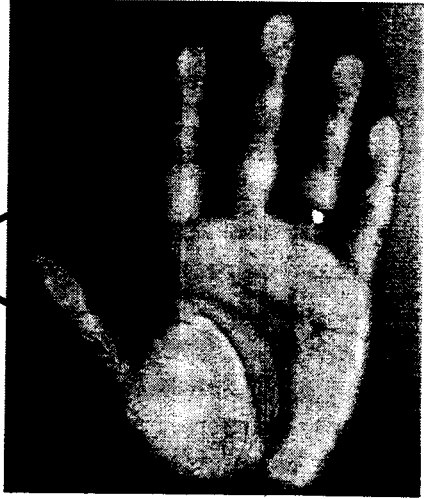
OX

35. A patient presents in the clinic with history of mild, recurrent right lower quadrant abdominal pain with history, physical and previous work up consistent with inflamed appendix. After ordering a surgical consult, you decide to check the patient for the presence of a Chapman's Reflex point. Specifically, where is the location associated with this organ?
- a. one inch lateral to and one inch above the umbilicus bilaterally
 - b. one inch lateral to and two and a half inches above the umbilicus bilaterally
 - c. tip of the left 12th rib
 - d. tip of the right 12th rib
 - e. proximal left thigh, anterolateral aspect
36. Incorporating OMT into a patient's treatment plan includes consideration of which of the following?
- a. the patient's social status
 - b. availability of capital
 - c. indications and contraindications
 - d. availability of an adjustable treatment table
 - e. intact axonal transport mechanisms
37. Which of the following OMT techniques has been shown through research to positively affect the immune system?
- a. cervical HVLA
 - b. muscle energy to the rib cage
 - c. lower extremity muscle energy
 - d. thoracic lymphatic pump
 - e. abdominal inhibitory pressure
38. Wall walking and pendulum swing are exercises give to patients with which one of the following medical conditions?
- a. tennis elbow/lateral epicondylitis
 - b. cervical radiculopathy
 - c. frozen shoulder/adhesive capsulitis
 - d. hip musculoskeletal dysfunction
 - e. upper extremity fibromyalgia
39. Use of pedal lymphatic pump and diaphragm release techniques on a patient with pneumonia reflects a treatment approach using what treatment model?
- a. mechanical
 - b. metabolic
 - c. neurologic
 - d. circulatory
 - e. bioenergetic

27. A 28-year-old elite female tennis player presents to your office complaining of “numbness” described as a “pins and needles” sensation of the area of her left hand, noted in the figure. There is a “flick” sign present and evidence of hypalgesia of the palmar aspect of the index finger compared to the 5th digit. What is the likely diagnosis and dermatome(s) involved?

- a. ulnar neuropathy, C4 dermatome
- b. radial neuropathy, C7 dermatome
- c. cubital tunnel syndrome, C5 dermatome
- d. Kiloh-Nevin Syndrome, C7 dermatome
- e. median neuropathy, C6 dermatome

“pins and needles”
parasthesia with
hypalgesia of the
index finger



28. With a diagnosis of OA ES_LR_R, and if using a Still technique, which hand would be labeled as the “sensing” hand?

- a. the right hand
- b. the hand that applies the vector force
- c. the operating hand
- d. the left hand
- e. the control hand

29. Regarding the above diagnosis, which of the following would be the initial position of treatment?

- a. OA ES_LR_R
- b. OA ES_RR_R
- c. OA FS_RR_L
- d. OS ES_LR_L
- e. in full cervical flexion

30. Approximately how much pressure is needed to relax the tissues under the “sensing” finger for the above diagnosis?

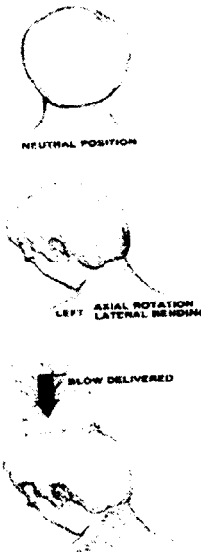
- a. 10 lbs or more
- b. 8 lbs or less
- c. 1-5 lbs
- d. 6-8 lbs
- e. 8-10 lbs

19. A 57-year-old male has COPD and rib somatic dysfunctions. When treating thoracic paraspinal soft tissue tension with functional (indirect) OMT in the lateral recumbent position using the arm:

- push the dysfunctional rib towards its vertebra to relax the joint
- move the arm so as to increase tension overlying the rib somatic dysfunction
- have the patient breathe out if the soft tissues tighten during exhalation
- find the arm movements and breathing phase that relaxes the soft tissues
- distract the ipsilateral scapula, lift the ribs anteriorly and have the patient inhale

20. Your 28-year-old female elite class tennis player presented to your office complaining of left upper extremity pain and parasthesias affecting the nape of her neck, and extending distally to some of the fingers of her left hand. A maneuver is performed as shown in the figure and is exacerbating of her presenting symptoms. What is the **name of the maneuver** and the likely **diagnosis**?

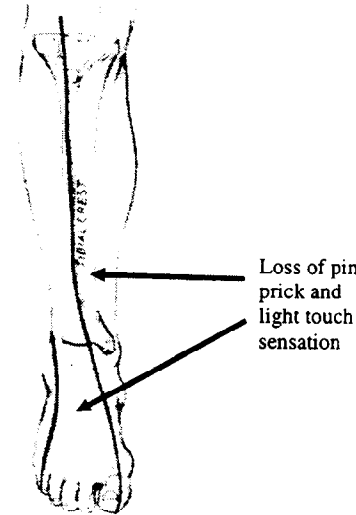
- Spurling's maneuver, cervical radiculitis/radiculopathy
- Adson's maneuver, thoracic outlet syndrome
- Apley's maneuver, double crush syndrome
- Lachman's maneuver, cervical radiculopathy
- Phalen's maneuver, single crush syndrome



21. A 27-year-old female complains of recurrent back pain refractory to exercises and medication and no history of organic disease. She has a right positive standing and seated flexion test, her right PSIS is inferior to the left and her right ASIS is superior to the left in the supine position. She has a right shallow sacral sulcus and posterior left inferior lateral angle (ILA), more symmetrical upon lumbar hyperextension. She has a 1/4 inch short left leg noted upon supine medial malleoli evaluation. After treating her somatic dysfunction with OMT, **which of the following is the correct next clinical decision?**

- order standing A-P pelvic x-ray
- order supine A-P pelvic x-ray
- order a 1/4" left heel lift
- order a 1/8" left heel lift
- re-evaluate structural findings

12. A 42-year-old male presents to the emergency room with a complaint of **acute low back and left lower extremity pain of 3 days duration** after lifting a heavy piece of furniture. Upon examination, you note evidence of TART characterized by left lumbar paravertebral muscle spasm, a palpatory sense of warmth, there is **weakness of foot (ankle) dorsiflexion and sensory loss to light touch and pin prick** as shown in the figure. The **knee myotatic (deep tendon) reflex is 1+** with the **ankle jerk reflex 2+**. What is the **neurologic localization** of this clinical presentation?



- a. S1-2
- b. L4-5
- c. L2-3
- d. L1-2
- e. L5-S1

13. A 58-year-old obese African American male presents to your office complaining of a 6-month prodrome of right low back and right leg pain. Palpatory examination reveals evidence of TART associated somatic dysfunction characterized by ~~ropiness~~ and soft tissue hypomobility of the right lumbar paravertebral musculature. There is evidence of external hemorrhoids and rectal bleeding. PSA values are 12.0 ng/ml (normal range 0-4) with a nodular, hard prostate gland palpated on DRE (digital rectal exam). What would be an appropriate intervention?

- a. administration of HVLA to the lumbar spine to address the somatic dysfunction
- b. teach stretching exercises and have the patient return to the clinic in one month
- c. administration of an electromyogram (EMG) to evaluate for underlying sciatica
- d. administration of a lumbosacral magnetic resonance imaging (MRI) study to evaluate for neoplasm
- e. administration of a narcotic analgesic to control the patient's complaint of back and leg pain

14. In order to make a diagnosis of somatic dysfunction and recommend OMT as part of the management plan, what will you need on the hospital H&P?

- a. state you did an osteopathic structural exam with the patient supine and sidelying
- b. state the viscerosomatic reflex region along the spine that is related to the internal organ problem for which the patient is admitted
- c. document restriction of motion and at least one of the following: tissue texture abnormalities; structural asymmetry; or tenderness upon palpation
- d. document a history of back or neck pain in the review of systems or as part of the current chief complaint
- e. elicit tenderness upon palpation of paraspinal soft tissues

4. A 27-year-old female computer operator presents to [redacted] complaining of a dull, aching pain over the anterolateral aspect of her right forearm. The symptom is provoked by typing on her computer keyboard and during the examination with restricted wrist dorsiflexion. There is point tenderness palpated on the **anterolateral aspect** of the cubital fossa region. What is the likely diagnosis and proper patient positioning if you elected to use the RAD counterstrain point to treat her?

- a. carpal tunnel syndrome, position the patient's elbow in full flexion with marked palmar flexion of the wrist
- b. cubital tunnel syndrome, position the patient's elbow in marked pronation over the patient's chest
- c. lateral humeral epicondylitis, position the patient's elbow in full extension with supination of the forearm
- d. ligament of Struthers syndrome, position the patient's elbow in marked abduction and pronation
- e. medial humeral epitrochliitis, position the patient's elbow in supination and adduction

5. How would one refer to changes in the musculoskeletal system that are related to the patient's visceral disease?

- a. presenting symptoms
- b. subjective part of the SOAP note
- c. allostatic load
- d. somatic component
- e. facilitated region

6. A 2002 study by **Schmanke, et. al.**, performed on rats with traumatic lesions to their cerebral sensorimotor cortexes, suggested that OMT can do which of the following?

- a. improve lymphatic drainage in and out of the cerebral cortex
- b. improve locomotor recovery when combined with task specific practice
- c. improve thoracic respiratory excursion via activation of pontine respiratory centers
- d. decrease amplitude and latency of cerebral somatosensory evoked potentials (SEP)
- e. cause premature death (demise) of the rats

7. A 22-year-old male had a whiplash neck injury 2 weeks ago. Which of the following symptoms are due to autonomic dysfunction?

- a. blurred vision
- b. ataxia
- c. epistaxis
- d. hemiparesis
- e. seizure