

Clinical Osteopathically Integrated Learning Scenario

Patient with Bacterial Lobar Pneumonia



Description of COIL

This Clinical Osteopathically Integrated Learning (COIL) scenario focuses primarily on the palpatory evaluation and supportive osteopathic manipulative treatment of a Patient with Bacterial Lobar Pneumonia.

The COIL is divided into two sections:

Section One:

The **Roundtable Discussion Workshop** includes a discussion and evaluation of the patient's case history, diagnosis, pathophysiology, osteopathic principles involved, functional anatomy, treatment options, contraindications and (if time permits) a demonstration of manipulative treatment techniques that are applicable for this patient.

Section Two:

The **Patient-based Application Workshop** is the supervised application of manipulative treatment techniques for a patient with this diagnosis. It is designed to evaluate the student's/physician's diagnostic and psychomotor skills when providing an osteopathic manipulative treatment for an actual (or simulated) patient.

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If time permits, the instructor may deliver this entire two-section program at one time. However, it is recommended that the program be divided into its two sections. Ideally, the sections should be separated by a number of days. This provides time for the student or physician to review and practice appropriate techniques before completing the second section. If an actual patient is not available for the second section, a simulated patient may be used and the psychomotor skills of the student or physician evaluated.

Section One: Roundtable Discussion Workshop

I. Description

This is a roundtable-type presentation and discussion on the osteopathic approach to the treatment of a patient a patient with bacterial lobar pneumonia.

II. Cognitive Components

A. Case Presentation

A 54-year-old male presents to ER with shortness of breath, weakness, productive cough with sharp chest pain, and fever for the past three days. The patient further reports symptoms of dyspepsia, headaches, insomnia, and general body aches.

The patient is a recently unemployed welder and reports feelings of stress for the loss of that position. The patient in resides with immediate family, including a three-year-old granddaughter who is currently in daycare and recently had a common cold..

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The patient is currently taking Tylenol as needed for pain, vitamin C (500 mg) daily, and an unknown dose of Captopril daily. He also taken two-year-old ampicillin, of unknown strength, three times a day for two days, with no effect. The patient has no known allergies to medications or foods. The patient smokes 1 1/2 packs of cigarettes daily for 30 years, reports occasional use of alcohol and no illegal drug use.

The patient was diagnosed with hypertension three years ago; open cholecystectomy (37) and appendectomy (14). His father died at age 56 of a myocardial infarction; his mother is alive and well. One of his three siblings has diabetes mellitus, hypertension, and he has an uncle with tuberculosis.

Physical Examination:

Vital Signs: Temperature, 102; Heart Rate, 108; Blood Pressure, 154/92; Respiratory Rate, 36

General: Alert and interactive, "worn out"

Skin: Clammy, and sweaty, Remains tented at 10 seconds

Head: Normocephalic; atraumatic without any lesions

Ears: Tympanic membrane intact without erythema

Eyes: Pupils equal, round, reactive to light, and accommodation; external ocular muscles intact; funduscopic exam without papilledema, hemorrhages, or exudates

Nose: Nares without discharge, turbinates engorged, no sinus pressure tenderness, no epistaxis

Throat: Oropharynx without discharge or exudates, tonsils small, no exudates, uvula midline

Mouth: Mucus membranes appear marginally dry

Neck: No adenopathy, thyroid not enlarged, trachea midline and moveable, no masses

Lungs: Decreased breath sounds right lower lobe with minimal end inspiratory crackles, wheezing noted

Cardiac: Rapid rate and rhythm at 108 bpm; no rubs, clicks, or gallops

Abdomen: Well-healed scar noted in the right upper quadrant consistent with surgical history; bowel sounds within normal limits; abdomen soft, protuberant; no masses, tenderness or rebound

Extremities: Cyanosis and clubbing are noted; +1 edema, capillary refill ?

Rectal: Sphincter tone within normal range. Occult blood negative; prostate firm without nodularity

Genitourinary: No scrotal edema

Neuro: Cranial nerves II-XII intact, deep tendon reflexes are bilaterally symmetric, 2+/4+ in the upper and lower extremities. No motor, sensory, cerebellar or cognitive deficits Babinski's response absent, toes are downgoing bilaterally. Weber and Rinne tests are non-lateralizing

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Diagnostics:

- CBC: Pending
- Sputum: Pending but color is yellow/green
- Arterial Blood Gas:
- EKG: Tachy sinus rhythm with no ischemic changes
- Chest x-ray: Right lower lobe consolidation
- PPD: 3years ago, negative
- Chest CT:

Osteopathic Structural Examination:

- Right temporal bone is internally rotated, with tender right occipitomastoid suture
- Tenderness mid-cervical area with C4RRSR, plus focal tenderness right OA with OA ESLRR.
- Respiratory excursions decreased on the right, especially in ribs T4-10
- Elevated left first rib with tenderness located lateral to the sternoclavicular junction
- Diaphragmatic restriction on right side of the abdomen
- Right rib angles 2-4 posterior, tissue texture changes of boggy, tenderness noted. T2 and T3
- ERLLL. T10-L2 paraspinal muscle tension increased on the right.
- General decreased mobility in lumbosacral region with decreased spring compliance at the lumbosacral junction in extension
- Right scapula myofascial tension, right hip inflare with internally rotated right hip

B. Pathophysiology

1. The infectious agents that cause pneumonia can be acquired in four ways:
 - a. Aspiration of an infecting agent
 - b. Inhalation of an offending agent
 - c. Hematogenous spread of infecting agent
 - d. Contiguous spread on the infection.
2. Pneumonia is exacerbated by decreased ventilator ability, or, splinting of the thoracic cage, and general whole body fatigue.
3. Respiratory-neurological-circulatory function is disturbed. The thoraco-abdominal diaphragm is stressed, restricted and probably flattened. The accessory muscles of respiration are fatigued. There are active viscerosomatic and somatovisceral reflexes and mechanical problems with the respiratory airways.
4. The compliance of the rib cage is decreased and tissues are congested.
5. Consider medications/pharmacological influences and interactions.
6. Consider hydration and nutritional influences.

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C. Functional Anatomy

Includes knowledge of structure and physiology necessary to properly carry out the osteopathic manipulative treatment support.

1. The respiratory center at base of fourth ventricle; tentorium cerebelli and temporal bone are in motion as they relate to respiratory function.
2. OA, AA, C2 and the jugular foramen of the cervical spine relative to the vagus nerve; C3-5 relative to the phrenic nerve and the phrenic nerve pathway.
3. Thoracic spine and costovertebral joints relative to the paraspinal sympathetic ganglia.
4. Rib cage relative to compliance and respiratory function; thoraco-abdominal diaphragm.
5. Lumbar spine related to diaphragm attachments and respiratory function.
6. Relationship of the sacrum and pelvic diaphragm to respiratory motion.
7. Extremities relate to respiratory motion and function.
8. Pertinent autonomic, lymphatic and myofascial relationships.

D. Goals for Osteopathic Manipulative Management

Includes a review of treatment pearls, a general plan for manipulative treatment of this patient and a discussion of treatment options, contraindications and plans for follow-up evaluation and treatment.

1. Normalize autonomic tone. Rib raising is the recommended treatment.
2. Treat the OA somatic dysfunctions as needed
3. Improve thoracic cage compliance with thoracic myofascial release

4. Enhance lymphatic return to the heart.
5. Reduce contributions to the facilitated cord segments, thereby reducing hypersympathetic tone to the lungs.
6. Maximize efficiency of the diaphragm with cervical spine, suboccipital inhibition and relieve any mid-cervical somatic dysfunction; thoracolumbar soft tissue release; diaphragmatic release indirect method using CV-IV.
7. The following is a possible progression of treatment, but each patient must be individually evaluated and treated as indicated by symptoms and severity of the disease. In all diseases, the treatment of areas that are involved with hypersympathetic tone is usually the first place to start:
 - a. Rib raising or paraspinal inhibition by gentle paraspinal inhibition in acute phase (after acute phase, may use more direct method); mild springing, gentle direct method manipulation.
 - b. Thoracic inlet and diaphragm release (dome the abdominal diaphragm); balance pelvic diaphragm with thoracolumbar diaphragm
 - c. Cervical soft tissue followed by muscle energy and indirect fascial release
 - d. Strain/counterstrain to first rib
 - e. Thoracic, pectoral traction, pedal pump
 - f. Muscle energy to upper thoracic area
 - g. Myofascial unwinding of bilateral upper extremities, scapular myofascial release
 - h. Lumbosacral spine indirect or direct (i.e., muscle energy)
 - i. Cranial indirect treatment to improve temporal bones mobility, occipitomastoid suture v-spread and condylar decompression for normalization of vagal function. Venous sinus drainage and CV-IV technique
 - j. Pelvic and hip somatic dysfunction treatment with muscle energy or myofascial release
 - k. Treat Chapman's reflex points if present.
8. After initial treatment attention can be focused on secondary effects e.g., lumbopelvic somatic dysfunction, scapular somatic dysfunction.

E. Contraindications and Cautions Regarding Treatment

See contraindications to treatment, Foundations, pp. , pp. 1015-1024.

1. Forceful or direct method treatments are not preferred.
2. Do not overtreat or fatigue the patient.
3. Do not use treatment positions that restrict the patient's respiratory efforts.
4. If pleurisy is present, do not aggravate the condition and cause pain by overtreatment

F. Instructor's Notes

Personal clinical pearls and lessons learned from previous COIL presentations.

1. A patient with lobar pneumonia may have two sets of palpatory findings:
 - a. Tissue changes from upper thoracic viscerosomatic reflexes
 - b. Mid and lower thoracic findings from pleural involvement (the direct referral from viscera to somatic structure).
2. The viscerosomatic reflexes from the lungs, based on palpatory experience, are from T1-4. T1-6 based on neuroanatomy charts, and to make sympathetic innervations for the lungs in relation to other organs easier to remember.
3. Somatic afferent nerves transmit pain signals directly referred from the somatic chest wall. When the pleura is involved, palpable paraspinal and intercostal tissue changes occur at the somatic segmental level of the pleural involvement, from T1-12.
4. Cyanosis may be due to a ventilation-perfusion mismatch. Consolidated areas are not ventilated, but are perfused.
5. Increased sympathetic tone to the respiratory epithelium of the lungs results in the production of thick, sticky, tenacious secretions that are difficult for the patient to clear out.
- 4.2 6. Chest physical therapy is indicated, in addition to OMM/OMT. OMM/OMT for pneumonia is directed toward:
 - Enhancing thoracic cage motion, reducing sympathetic tone.
 - Decreasing the effects of viscerosomatic reflexes.
 - Freeing any somatic dysfunction of the thoracic inlet.
 - Freeing restrictions to diaphragmatic motion so that lymphatic drainage is optimal for the patient.
7. Recent studies show treatment with OMM/OMT significantly decreases length of hospital stay and confinement time.

III. Psychomotor Components

If time permits, this is carried out on a simulated patient model.

1. Practice palpatory diagnosis. See techniques under Section D above. Diagnoses procedures include rib rising, thoracic inlet palpation, thoracoabdominal diaphragm palpation, thoracic cage compliance, tissue texture palpation, evaluation, and Zink whole body fascial pattern.
2. Demonstrate key treatment techniques in the body regions involved. This includes thoracic myofascial treatment, paraspinal inhibition, doming the diaphragm, thoracic inlet treatment, pectoral traction, soft tissue, and CV-IV technique.
3. Evaluate the plan for treating the patient in the appropriate position, localization of gentle forces and activation

IV. References

Kuchera ML, Kuchera WA. Osteopathic Considerations in Systemic Dysfunction, Revised 2nd ED. Columbus, Ohio: Greyden Press; 1994: 33-52.

Noll DR, Shores JH, Gamber RG, Herron KM, Swift J. Benefits of Osteopathic Manipulative Treatment For Hospitalized Elderly Patients With Pneumonia. J Am Osteopath Assoc. 2000; 100(12):776-782.

Ward RC. Foundations for Osteopathic Medicine. Baltimore, Maryland: Williams & Wilkins; 1997: 441-458.

V. Examination Questions

This involves answering multiple choice questions regarding the treatment of a (denotes answer)*

- Which of the following findings most directly contributes to the respiratory/circulatory aspect of dysfunction?
 - Weight 190 pounds
 - Decrease respiratory excursion on the right. *
 - Left elevated first rib
 - Respiratory rate 31 or higher
 - Temperature 102 degrees
- Which of the following findings most directly contributes to the neuropathic aspects of dysfunction?
 - T4RRSR *
 - OA ERRSL
 - Restricted right hemi-diaphragm
 - Decreased lumbosacral spring
 - Smoking history
- Which of the physical findings can occur due to a viscerosomatic or somatovisceral association in this patient?
 - T4RRSR *
 - Abdominal surgical scarring
 - Elevated first left rib
 - Hypertension
 - Restricted right hemi-diaphragm
- Which of the following items from the patient's history is a significant risk factor?
 - Family history of atherosclerotic cardiovascular disease
 - Smoking *
 - Living with granddaughter
 - Obesity
 - Depression secondary to job loss

5. Which of the following OMM/OMT would you choose as effective in expediting this patient's return to health?
- A. Lymphatic pump *
 - B. Strain/counterstrain
 - C. Myofascial release
 - D. Functional techniques
 - E. Muscle energy

Section Two: Patient-Based Application Workshop

I. Description

This is the practical application of osteopathic treatment techniques to support the patient with bacterial lobar pneumonia.

II. Psychomotor Components

(Refer to Section One for regions of the body that are involved.)

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1. Examination of the patient using TART, including postural screen, palpation, segmental motion testing and diagnosis of somatic dysfunction.
2. Application of philosophy and treatment technique.
3. Re-evaluation of the patient after treatment is completed to assess result. If a simulated patient is used, then the student/physician should verbalize length of treatment and future treatment goals.

III. Cognitive Components

1. Documentation in the medical record.
2. Post-treatment discussion.

Note: It is recommended to use the standardized outpatient form included in each of these chapters for documentation.

Physician: _____ Date: _____

Title: Resident (Specialty) _____

Intern OMS III OMS IV

Critical Actions Evaluation Checklist of Osteopathic Principals

CRITICAL ACTION	COMPLETED		COMMENTS
	Yes	No	
Become familiar with the patient's history physical examination findings, laboratory and other diagnostic findings.			
Perform an osteopathic structural examination.			
Determine significant areas of somatic dysfunction.			
Determine body region(s) to be treated with OMT.			
Apply OMT to at least the body region determined to be the most in need of treatment at present time.			
Treat other significant somatic dysfunctions if feasible.			
Document treatment and immediately observable effects.			

Trainer: _____