# COILS

Clinical Osteopathically Integrated Learning Scenarios

## Patient with
# Postsurgical Ileus

Prepared by: AACOM's Educational Council on Osteopathic Principles

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AMERICAN ASSOCIATION OF COLLEGES OF OSTEOPATHIC MEDICINE

Part 6: Chapter 2

**Surgery Clinical Osteopathically Integrated Learning Scenario:**

# Patient With Postsurgical Ileus

## Description

This Clinical Osteopathically Integrated Learning Scenario (COILS) focuses primarily on the palpatory evaluation and supportive osteopathic manipulative treatment for for a post-operative patient who has had abdominal surgery.

The COILS 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 applicable to the patient's homeostatic needs.

### Section Two

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

*If time permits, the instructor may deliver this entire two-section program at one time. Ideally, however, Section One should be taught several days before Section Two to allow the student or physician to review and practice appropriate techniques. If an actual patient is not available for Section Two, a simulated patient may be used.*

# Section: Roundtable Discussion Workshop

## I. Description

*This section is a round-table type presentation and discussion on the osteopathic approach to the treatment of a patient who has just had abdominal surgery.*

## II. Cognitive Components

### A. Case Presentation

A 58-year-old obese male, who is 48 hours status-post left hemi-colectomy with exploratory laparotomy, complains of persistent abdominal pain and bloating. He has not passed gas since surgery. His surgery was for colon cancer in the descending colon. He did not require a colostomy. He is still NPO and is receiving IV hydromorphone to control the pain.

Patient has a history of borderline diabetes and hypertension which he manages with diet. He reports occasional back pain. No prior surgeries and no regular medication usage. He developed progressively worsening constipation over the last six months which lead to the barium enema evaluation that revealed an "apple core" lesion, 35 cm from the anal verge in the descending colon.



#### Physical Examination

| | |
|---|---|
| **Vital signs:** | Temperature, 99.4° F; Blood Pressure: 155/86; Respiratory Rate, 20; Pulse, 90; Height,6' 4"; Weight, 271 lbs |
| **General:** | Appears in moderate distress; alert and oriented; pale; nauseated and belching |
| **Head:** | Normocephalic; atraumatic; symmetrical with edema |
| **Eyes:** | Pupils equal, round, reactive to light, and accommodation; extraocular movements intact |
| **Ears:** | Tympanic membranes intact; no fluid |
| **Nose:** | Turbinate pink; minimal mucus |
| **Throat:** | Central subclavian line on the left side |
| **Cardiac:** | Regular rate and rhythm without murmur |
| **Lungs:** | Decreased breath sounds at the bases—bilaterally; no rales, rhonchi, or wheezing |
| **Abdomen:** | Obese abdomen with m idline dressing, with some serosanguinous drainage; Penrose drain with 20 cc of blood-tinged fluid noted; abdomen distended; bowel sounds absent on auscultation; abdomen tender but without rebound; tympanic notes on percussion of abdomen |

| | |
|---|---|
| **Musculoskeletal:** | See osteopathic structural examination below |
| **Extremities:** | Compression boots in place; +2 pretibial edema; arterial pulses in both legs strong |

### Osteopathic Structural Examination

- Cranial: Cranial rhythmic impulse 8; low amplitude with sphenobasilar synchondrosis compression
- Cervical: OA extended, sidebent right, rotated left, with bilateral suboccipital muscular hypertonicity. Right AC1 and PC2 tender points
- Thoracic: Mild increase in thoracic kyphosis. T4 flexed, sidebent left, rotated left; T9 flexed, sidebent left and rotated left; anterior midline T4and left anterior T9 tender points; paravertebral spasm T6–T9; T12 extended, sidebent left and rotated left
- Lumbar: Bilateral paraspinal muscular hypertonicity. L1–L3 neutral, sidebent left and rotated right; bilateral iliacus tender points; right iliopsoas muscular hypertonicity
- Sacrum: Bilateral extension
- Chapman's reflexes: Positive for small bowel

### Diagnostics



- Chest x-ray: Subsegmental atelectasis
- Upright and supine abdomen portable x-ray: Dilated intestines with gas patterns and air fluid levels.

## B. Pathophysiology

1. Postoperative ileus is a common postoperative complication characterized by a delay in normal gastrointestinal motility resulting in abdominal distension, nausea and vomiting. Typically, normal stomach and small bowel motility returns within 24 to 48 hours postoperatively and colonic motility returns within 48 to 72 hours.[1]
2. Postoperative ileus is primarily the result excessive sympathetic nervous system activity combined with increased inflammatory mediators, decreased gastrointestinal hormones, and inhibition of bowel motility by endogenous and exogenous opioids.[1]
3. Irritation from the surgical incision, inflammation from the surrounding peritoneum, and surgical handling of the viscera results in heightened sympathetic nervous system activity which is inhibitory to normal propulsitile activity and gastrointestinal digestive hormone activity.[2] The sympathetic nervous system causes local release of nitric oxide, which inhibits motility and causes release of stress hormones such as hypothalamic corticotrophin releasing factor.This delays gastric emptying and inhibits gastric motility.[5] Proinflammatory mediators such as cytokines produced during the healing process are also inhibitory to normal propulsitile activity.[5] Classic treatment focuses on early ambulation with adequate pain control minimizing opioid usage with bowel sounds and flatus heralding resolution. [9]

4. Atelectasis, collapse of peripheral alveoli, is the most common postoperative respiratory complication.[9,10] This condition occurs due to the lack of deep breathing during the surgical procedure and in postoperative period due to pain and sedation. Secretions may accumulate in the collapsed alveoli, which may become infected with bacterial growth leading to pneumonia. Classic treatment focuses on early ambulation with adequate pain control and incentive spirometry to encourage deep breathing.[9,10]
5. Venous thromboembolism and pulmonary embolism are serious postoperative complication that results in 10-15% of all in-hospital deaths.[9] Thrombus forms in veins that have experienced injury or a stasis in flow.[9] Prevention includes anticoagulation and venous compression such as pneumatic hose to prevent venous stasis.[4]

## C. Functional Anatomy

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

1. The presence of preoperative somatic dysfunction may affect the body's ability to handle the trauma of surgery.[12]
2. Abdominal pain and distension combined with painful upper thoracic and rib somatic dysfunctions will decrease deep breathing leading to atelectasis and vascular and lymphatic fluid stasis.
3. Preexisting somatic dysfunction at C3-5 ,thoracic, ribs, and pelvis may affect the function and efficiency of the thoracic inlet, abdominal and pelvic diaphragm. [3] Preexisting spinal somatic dysfunction may cause segmental facilitation and/or central sensitization that may augment the nociception and elevated sympathetic tone from the surgical procedure.[6]
4. Any type of major surgery can result in a development of atelectasis and postoperative ileus.[3,9]

## D. Goals for Osteopathic Manipulative Management

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

1. MT of the postoperative ileus focuses on normalizing the autonomic nervous system, reducing biomechanical impediments to vascular and lymphatic flow, and aiding in non-opioid management of pain.[1]
2. Techniques that target the sympathetic nervous system include paraspinal inhibition, rib raising, collateral ganglia inhibition, and treatment of thoracic and lumbar spinal somatic dysfunctions that may be associated with viscerosomatic or somatovisceral reflexes.[1] Collateral ganglia inhibition, involves applying posterior pressure along the linea alba to decrease is an excellent technique when there are no midline abdominal incisions.

3. Techniques that target the parasympathetic system include treatment to the occipitoatlantal joint and sacrum to affect the vagus and sacral splanchnic nervous respectively.[1] Appropriate techniques include suboccipital release and sacral rocking.
4. Techniques to improve vascular and lymphatic flow focus on removing biomechanical restrictions at the thoracic inlet, abdominal diaphragm, and pelvic diaphragm.[8] Appropriate techniques may include articular technique to the first rib and cervical spine, myofascial release of the thoracic inlet, abdominal and pelvic diaphragms, and gentle pedal pumping.[8] Techniques such as mesenteric lifts and colonic stimulation, which directly interact with the bowel, should be used with caution to avoid direct contact with the surgical site.
5. Treatment of painful somatic dysfunction can accomplished by accomplished by a wide variety of techniques and should be individualized to the patient and dysfunction. For example a patient who is accustomed to receiving high velocity low amplitude (HVLA) techniques for neck pain, may request such techniques for the treatment of cervical somatic dysfunction in the inpatient setting.

## E. Contraindications and Cautions Regarding Treatment



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

1. Do not disturb ventilatory and drainage tubes, intravenous access and lines, and monitoring cords.
2. Do not put excessive pressure on the abdomen and avoid contact to the areas surrounding the surgical incisions.
3. Techniques should be individualized to the tolerance and cooperation of the patient.

## F. Instructor's Notes

Personal clinical pearls and lessons learned from previous COILS presentations.

1. The effects of osteopathic manipulation on postoperative ileus were first discussed in 1935 by K. Tomajan, DO.[14] Since then more studies have followed. A retrospective chart review by R. E. Henshaw, DO in 1963 showed that treatment of cervical somatic dysfunction prior to upper abdominal surgery reduced the incidence of post- operative atelectasis and other respiratory complications. It was hypothesized that OMT to the C3-5 region prior to surgery had a positive influence on the thoracoabdominal diaphragm by normalizing the phrenic nerve.[15] A 1966 study by E. Herrmann, DO, showed that paraspinal inhibition before surgery reduced the incidence of post-operative ileus by 7.3%.[7] Crow et al (2008) and Baltazar et al (2013), retrospectively reviewed the effect of OMT on postoperative patient and both found a statistically significant reduction in the incidence of ileus and in the length of stay.[3,2]

2. A 1993 study by Sandra L. Slesznski, DO compared the effectiveness of lymphatic pump techniques to incentive spirometry for the prevention of atelectasis in post-cholecystectomy patients. Both treatments were equally effective at preventing atelectasis, but the lymphatic pump techniques lead to a more rapid recovery of FVC and FEV1.[13]
3. Several studies have investigated the use of OMT after coronary artery bypass graft (CABG) surgery. O-Yurvati et al (2005) found that pre-OMT versus post-OMT measurements showed significant hemodynamic benefits with improved cardiac function and perfusion, suggesting that OMT improved fluid homeostasis.[11] Wieting et al(2013) found that patients who received OMT beginning the first day postoperatively had more rapid functional improvements and a decrease in LOS compared to control patients.[16]

## III. Psychomotor Components

*If time permits, this part can be carried out on a simulated patient.*

1. Perform palpatory diagnosis of key diagnostic regions including the occipitoatlantal joint, cervical; thoracic; ribs; lumbar; sacrum; thoracic inlet; thoracoabdominal diaphragm; and pelvic diaphragm.
2. Demonstrate gentle techniques to treat the somatic dysfunctions found.
3. Demonstrate specific techniques to target the autonomic nervous system including rib raising, paraspinal inhibition, suboccipital release, collateral ganglia inhibition, and sacral rocking.
4. Demonstrate abdominal and thoracic lymphatic pump techniques.



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## V. Examination Questions

*These multiple-choice questions involve treatment for a post-abdominal surgery patient. (* denotes answer)*

**1. Which of the following structures is most likely to play a role in maintenance?**

A. Facial and trochlear nerve
B. Spinal accessory and trochlear nerve
C. Vagus nerve and superior cervical chain ganglia
D. Vestibulocochlear and vagus nerve
E. Superior cervical chain ganglia and vestibulocochlear nerve

**2. Most nonsteroidal anti-inflammatory medication would be contraindicated because of a higher risk of:**

A. Diplopia
B. Gastric bleeding and melena
C. Ringing in the ears
D. Tenderness and fullness in the subxiphoid space
E. Tissue texture changes in the mid-thoracic paraspinal region



**3. Your attending has ordered rib raising. What is the rationale for this treatment?**

A. It will improve VQ function.
B. It will reduce cardiac output.
C. It will reduce sympathetic hypertonicity to the intestinal tract.
D. It will stimulate the diaphragm and improve lymphatic flow.
E. It should not have been ordered, because it is contraindicated in a person with an acute GI bleed.

**4. he following morning you recheck the patient. He reports that he begun to pass some gas, and his abdominal pain has resolved. He was able to get some rest after your treatment. Which of the following best indicates follow-up care?**

A. Because symptoms have resolved, no follow-up is necessary.
B. Re-evaluate the patient to determine if further intervention is necessary.
C. Repeat the same treatment twice more to ensure adequate resolution of somatic dysfunction.
D. Refer to physical therapy for initiating heat/cold (contrast) therapy.
E. Consult neurology services.

## Section Two: Patient-based Application Workshop

### I. Description:

*This section includes the practical application of osteopathic treatment techniques to support the patient who has just had abdominal surgery.*

### II. Psychomotor Components

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

1. Examination of the patient using TART, including postural screen, palpation, segmental motion testing and diagnosis of somatic dysfunction
2. Application of the osteopathic philosophy and at least one 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 Applicable to a Patient With Postsurgical Ileus

| 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:_____

# Osteopathic Musculoskeletal Examination

EXAMINER: SIGNATURE DATE OF EXAMINATION

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CHIEF COMPLAINT:

Required

**Ant.Post.Spinal Curves:**

Cervical Lordosis

☐ Increased ☐ Normal ☐ Decreased

Thoracic Kyphosis

☐ Increased ☐ Normal ☐ Decreased

Lumbar Lordosis

☐ Increased ☐ Normal ☐ Decreased

**Scoliosis** (Lateral Spine Curves)

☐ None ☐ Functional ☐ Mild ☐ Moderate ☐ Severe

**Assessment Tools**

☐ **T** = Tenderness

☐ **A** = Asymmetry

☐ **R** = Restricted Motion ☐ Active ☐ Passive

☐ **T** = Tissue Texture Change

For coding purposes only

**Abbreviation Key**

**OA** Occipito-Atlantal joint

**Sympathetic Ganglia:**

**C** Celiac

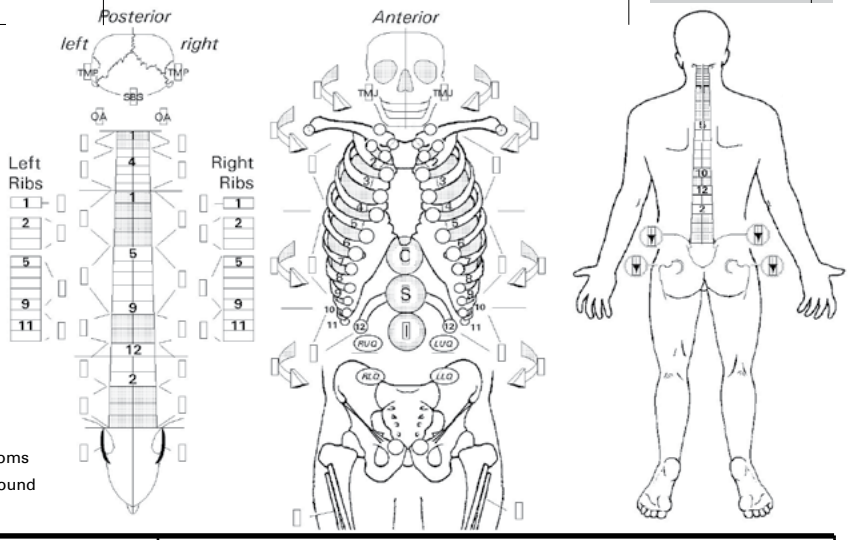
**S** Superior Mesenteric

**I** Inferior Mesenteric

**TMJ** Temporomandibular joint

**TMP** Temporal Bone

**SBS** Sphenobasilar symphysis




**Severity Key**

**0** No SD or background (BG) levels

**1** Minor TART more than BG levels

**2** TART obvious (R&T esp) +/- symptoms

**3** Symptomatic, R and T very easily found "key lesion"

| Region Evaluated | | Severity 0 | 1 | 2 | 3 | Specific Major Somatic Dysfunctions |
|---|---|---|---|---|---|---|
| Head | | ☐ | ☐ | ☐ | ☐ | |
| Neck | | ☐ | ☐ | ☐ | ☐ | |
| Thoracic | T1-4 | ☐ | ☐ | ☐ | ☐ | |
| | T5-9 | ☐ | ☐ | ☐ | ☐ | |
| | T10-12 | ☐ | ☐ | ☐ | ☐ | |
| Lumbar | | ☐ | ☐ | ☐ | ☐ | |
| Pelvis/Sacrum | | ☐ | ☐ | ☐ | ☐ | |
| Pelvis/Innominate | | ☐ | ☐ | ☐ | ☐ | |
| Extremity Lower | R | ☐ | ☐ | ☐ | ☐ | |
| | L | ☐ | ☐ | ☐ | ☐ | |
| Extremity Upper | R | ☐ | ☐ | ☐ | ☐ | |
| | L | ☐ | ☐ | ☐ | ☐ | |
| Ribs | | ☐ | ☐ | ☐ | ☐ | |
| Other/Abdomen | | ☐ | ☐ | ☐ | ☐ | |

**Major Correlations with:**

☐ Traumatic ☐ Orthopedic ☐ Neurological ☐ Viscerosomatic ☐ Primary Musculoskeletal ☐ Activities of Daily Living

☐ Rheumatological ☐ EENT ☐ Cardiovascular ☐ Pulmonary ☐ Cardiovascular ☐ Genitourinary

☐ Other: