

## Facilitator's Guide

**Section I: OMM Case Presentation. Prior to the next OMM session Residents should read the case below and be prepared to discuss the questions in Section II on page 4.**

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### Case Presentation

**Chief Complaint:** Protracted nausea and vomiting

**History:** A 79-year-old Caucasian female with a 4-year history of gastroesophageal reflux disease (GERD). She has had multiple esophagogastroduodenoscopies (EGDs) and colonoscopies to investigate similar gastrointestinal complaints, all of which have been negative. The patient states that for the past year she has also had uncontrolled flatus for which she has also gone through a battery of tests and studies all of which have been negative. However, 6 months ago an EGD performed by a local surgeon revealed that she had a hiatal hernia. The patient has been taking over-the-counter medications as well as prescription medications to control her reflux symptoms. She failed these therapies. It is her understanding that she was being prepared for a hiatal hernia repair when it was discovered that she had a pneumoperitoneum. While investigating the pneumoperitoneum, it was discovered that she had a duodenal ulcer. The ulcer was suspected for being the most likely cause of the air. Obtained from old records, the patient has had a CT scan of the abdomen, which showed some free air in the wall of the small intestines, and she was taken to surgery for a resection of this area and for further investigation. The pathology report of that resection of bowel showed "subserosal variant of pneumatosis cystoides intestinalis". The patient was released to home, and then returned after developing increasing nausea and vomiting. She has now been hospitalized for six days and continues to have nausea, which improved significantly with nasogastric tube placement. Internal medicine and OMM are being consulted regarding ileus.

**PMH:** Hypothyroidism; gastroesophageal reflux disease; osteoarthritis of the spine; hiatal hernia; duodenal ulcer; history of pneumoperitoneum

**PSH:** Bowel resection; tonsillectomy; appendectomy

**Meds:** HOME MEDICATIONS = Levothyroxine (*Synthroid*) 0.05 mg daily, Multi-Vitamin supplement, and Vitamin C supplement; HOSPITAL MEDICATIONS = Piperacillin/Tazobactam (*Zosyn*) 3.375 g IV q6h, Albuterol (*Proventil*) 2.5 mg NEB qid, Bisacodyl Rectal (*Dulcolax Suppository*) 10 mg PR qday, Calcium Carbonate (*Tums*) 1 g PO qid

**Allergies:** Codeine

**Social History:** Married 23 years with her second husband and has two children. She is a retired librarian and also worked as a secretary at City Hall. She has a 12<sup>th</sup>-grade education. She has a 50+ pack-year-history of smoking but states she quit 4 years ago. She reports drinking alcohol only on social occasions and denies any use or abuse of illicit drugs.

**Family History:** Mother died of cardiac complications at the age of 98. She also had colon cancer, congestive heart failure, hypertension, and chronic renal failure. Patient's father died at the age of 61 from gastric carcinoma. He also suffered from hypertension.

**Review of Systems:**

The patient admits to decreased appetite and weight loss of 20 pounds over the last year. She has one cataract. She has upper dentures. She had menopause at 60 years old. She routinely has mammograms with no abnormalities identified. She has had multiple colonoscopies and EGDs in the past year. She has never had a cardiac stress test. She has had a pulmonary function test in the past that was unremarkable. She currently denies any fevers, chills, headaches, visual changes, hearing changes, difficulty swallowing, chest pains, palpitations, cyanosis, dyspnea at rest or on exertion, hemoptysis, bleeding disorders or easy bruising, or any intolerance to temperature changes. She also denies any dysuria, hematuria, melena, hematochezia, seizures, numbness, paralysis, weakness, depression, anxiety, or hallucinations.

**Physical Exam: VITALS:** Blood Pressure 105/66; Heart Rate 84; Respiratory Rate 20; Temperature 97°F. **GENERAL:** This is a 79-year-old Caucasian female who appears her stated age. She is alert and oriented to person, place, and time. She is pleasant and appropriate in conversation. She is in no acute distress. **HEAD:** Head is atraumatic and normocephalic without evidence of masses or bruising. **EYES:** Pupils are equal, round, and reactive to light and accommodation. Extraocular muscles are intact. There is no evidence of scleral icterus or ptosis. **EARS:** Hearing intact, as are the tympanic membranes. **NOSE:** Nares are patent without evidence of drainage or congestion. A nasogastric tube is in place. **MOUTH/THROAT:** The patient is edentulous for the upper dentition, and possesses her own teeth for the lower dentition. Mucous membranes are dry. The oropharynx is otherwise unremarkable. **NECK:** The neck is supple without evidence of thyromegaly or lymphadenopathy. Carotid bruits are not auscultated. No jugulovenous distention is appreciated. **CARDIOVASCULAR:** Heart has a regular rate and rhythm with S1 and S2 distinct. **LUNGS:** The lungs are clear to auscultation bilaterally without rales or rhonchi. **ABDOMEN:** There is diffuse ecchymosis, most prominent on the right abdomen. Crossing midline there are two incision sites wrapping around to her back and flank.

Her abdomen is soft, but tender secondary to surgery. Bowel sounds are present but distant.

**GENITOURINARY:** The patient has a Foley catheter in place. **RECTAL:** There is normal rectal tone. No masses are palpable. No frank blood is noted. External hemorrhoids are present.

**EXTREMITIES:** The extremities demonstrate adequate range of motion without limitation. There is no edema present in the lower extremities. **NEUROLOGIC:** Cranial nerves II through XII are grossly intact without lateralizing signs. There are no focal sensory or motor deficits noted. Deep tendon reflexes are bilaterally symmetrical in the upper and lower extremities.

**MUSCULOSKELETAL:** There is an increase in the thoracic kyphotic curve. There are scoliotic changes apparent, and the patient states that these have been present most of her life.

***Osteopathic Structural Exam:***

Paraspinal muscle tissue texture changes are evident at the levels of T9 through L1, especially on the right side. The corresponding vertebrae are all sidebent right, rotated left, and have an extension preference. The thoracoabdominal diaphragm fascia is restricted on the right. The thoracic inlet is rotated right, sidebent left, and flexed. Ribs 5 through 9 on the right are restricted in exhalation. There is significant restriction at the right sacroiliac joint. Chapman's points are present in the iliotibial band on the left, the left upper thigh, and the right mid thigh. At the head, the OA is sidebent right, rotated left, and flexed. In the cervical spine C3 through C5 are extended, rotated and sidebent right.

***Assessment:***

Be prepared to discuss this at the OMM session. Indicate the primary Medical Diagnosis based upon the international Classification of Diseases (ICD-9). This justifies the Evaluation and Management (E&M) coding portion of the visit. List all secondary, comorbid, and complicating factor diagnoses in order of importance. Itemize somatic dysfunction diagnosis for each body region treated using OMT. This justifies reimbursement for OMT. Be prepared to discuss management of typical comorbid and complicating factors associated with the patient's diagnosis and how management and treatment would be modified with each comorbid and complicating factor.

**Section II: Mini-Lecture/Discussion (approximate time 20–30 minutes)**

**Discussion Questions**

**Teaching Point**

<p>1. Propose an appropriate differential diagnosis / assessment.</p>	<p><b><u>Differential Diagnoses:</u></b>          Abdominopelvic Abscess          Anastomotic Leaks          Antihistamines          Appendicitis          Paralytic Postoperative Ileus          Small Bowel Obstruction          Hemoperitoneum          Cholecystitis / Cholelithiasis          Hypo (kalemia / magnesemia)          Pancreatitis          Chronic Intestinal Pseudo-obstruction          Volvulus          Opiates          Myxedema          Sepsis          Uremia</p>
<p>2. What are the appropriate laboratory tests and their results?</p>	<p>1.</p>
<p>3. What is your final diagnosis?</p>	<p>1. Post-Operative Ileus          2. Hx of Pneumoperitoneum          3. Hx of duodenal ulcer          4. Hx GERD          5. SD of C, T, L spine, ribcage, and abdomen</p>
<p>4. How do you explain the current structural findings in the context of this case?</p> <ul style="list-style-type: none"> <li>• Are any relevant structural findings missing?</li> <li>• What would you do differently?</li> <li>• Why?</li> </ul>	<p>The parasympathetic reflex as far as the mid transverse colon is from vagal input Dysfunction at the occiput, C1, and C2 can adversely affect vagus function</p> <p>C3,4,5- compromised diaphragm function</p> <p>The sympathetic viscerosomatic reflex from the small intestine can manifest at T8 to T10, bilaterally (possibly right greater than left).</p> <p>The vermiform appendix and cecum result in reflex tissue texture change from T9 to T12 on the right. The ascending colon results in reflex tissue texture change from T11 to L1 on the right.</p> <p>At the level of the mid transverse colon, the parasympathetic viscerosomatic reflex shifts from vagal to pelvic splanchnic, S2 to S4, resulting in sacro-pelvic tissue change and tenderness.</p> <p>Pathology affecting the descending colon to the rectum results in reflex tissue texture changes form L1 to L3 on the left." (<i>Somatic Dysfunction in Osteopathic Family Medicine</i>, p.43)</p>

	<p>Comorbid factors may also contribute to the patient's increased thoracic kyphosis, and, in turn, the scoliosis noted could be a contributing element to the postoperative complications.</p> <p>Additional Chapman's reflex points were not identified in this patient, but would be very helpful in narrowing the differential diagnosis and focusing treatment.</p>
<p>3. What pathophysiology &amp; functional anatomy knowledge is pertinent for diagnosing/treating this patient?</p>	<p>Vagal afferents are thought to be important in the coordinated integration of motility, secretion, and absorption while spinal afferents are thought to be responsible for the transmission of noxious stimuli and inflammation. Visceral motor efferent outflow consists of the sympathetic thoracolumbar and parasympathetic cranial-sacral arms of the autonomic nervous system (ANS). Sympathetic activity is generally inhibitory to smooth muscle activity, while parasympathetic input can be excitatory or inhibitory. The enteric nervous system (ENS) also has the basic circuitry necessary to run independently through local circuits that rely on signals from intrinsic sensory neurons and neurohumoral peptides, such as substance P, vasoactive intestinal peptide (VIP), and nitric oxide (NO), which can act either in a paracrine or endocrine fashion." (<i>Uptodate.com</i>, "Postoperative Ileus")</p> <p><b>Metabolic and electrolyte derangements (e.g., hypokalemia, hyponatremia, hypomagnesemia, uremia, diabetic coma); Drugs (e.g., opiates, psychotropic agents, anticholinergic agents); Intra-abdominal inflammation; Retroperitoneal hemorrhage or inflammation; Intestinal ischemia; Systemic sepsis;</b> These are all comorbid factors that in and of themselves can cause ileus and/or alter the body's physiologic and/or anatomic makeup.</p>
<p>4. What will be your highest yield regions?</p>	<ol style="list-style-type: none"> <li>1. Thoracolumbar region – for sympathetic inhibition</li> <li>2. Sacropelvic region – for parasympathetic stimulation</li> <li>3. Cervical/Suboccipital region – for parasympathetic stimulation</li> <li>4. Abdominal diaphragm – to reduce restriction surrounding the vagus nerve distribution and aid in lymphatic drainage</li> <li>5. Abdominal viscera – promote movement and free fascial restrictions upon the internal organs</li> </ol>
<p>7. How does previous trauma influence these regions?</p>	<p>The patient fell in 1996, and though not diagnosed at the time, could have introduced somatic dysfunction to vertebral levels affecting the innervations of the gastrointestinal system. Left untreated, a chronic somatic dysfunction will affect the overall functionality of the gastrointestinal system.</p>
<p>8. Which 1 or 2 of the aspects below has the greatest influence on the patient complaint?</p> <ul style="list-style-type: none"> <li>• Pain</li> <li>• Fluid congestion</li> <li>• Hyper-sympathetic influence</li> <li>• Parasympathetic influence</li> </ul>	<p>Pain</p> <p>Hyper-sympathetic influence</p> <p>Decreased Parasympathetic influence</p> <p>Fluid Congestion</p>

<p>9. What are the acute and chronic aspects?</p>	<p><b>Acute</b> - abdominal pain, absence of bowel movements, nausea/vomiting, and recent surgery.  <b>Chronic</b> - hypothyroidism, GERD, uncontrollable flatus, unexplained weight loss (20 lbs over last year), osteoarthritis, hiatal hernia, and duodenal ulcer.</p>
<p>10. Devise an appropriate treatment plan based on musculoskeletal components involved in the patient complaint.</p>	<p><b>Goals for OMM Management:</b></p> <ol style="list-style-type: none"> <li>1) Balance Autonomic nervous system       <ul style="list-style-type: none"> <li>• Decrease hyper-sympathetic tone</li> <li>• Remove restrictions to improve parasympathetic tone</li> </ul> </li> <li>2) Improve/increase fluid movement</li> <li>3) Improve diaphragm motion</li> </ol> <p><b>The treatment plan could include:</b></p> <ol style="list-style-type: none"> <li>1) Paravertebral muscle inhibitory pressure (rib raising); specifically at the thoracolumbar junction</li> <li>2) Pectoral traction</li> <li>3) Abdominal diaphragm fascial release</li> <li>4) Gentle abdominal visceral manipulation</li> <li>5) Sacroiliac gapping bilaterally</li> <li>6) Sacral rocking</li> <li>7) Cervical soft tissue and articulation (ME, S-CS, MFR, Still)</li> <li>8) Suboccipital condylar decompression</li> </ol> <p>When treating the postoperative patient, it is necessary to be cognizant of the surgical sites, dressings, and patient comfort/pain level.</p>
<p>11. What are the dose and frequency considerations?</p>	<p>Dosing should essentially be limited to the areas of highest yield during inpatient care with techniques limited to gentle modalities. Frequency can vary, but typically for ileus should be at least daily, but may be more beneficial to treat twice daily.</p> <p>“Dosage and tolerance are important to the treatment of the surgical patient. Tolerance is determined by age, by severity of illness, and postoperatively, by the circumstances of the surgical site. How much OMT is enough? One should choose a procedure the patient will tolerate and treat the patient until a response occurs.</p> <p>“What kind of response should the clinician look for? Relaxation of the soft tissues in the area being treated is a good response, often referred to as a release. Vasodilation resulting in increased skin temperature or redness and increased sudomotor activity indicates it is time to stop treatment. Increased heart or respiratory rate also indicates that the patient has reached the level of tolerance. If the patient feels that the intervention is too uncomfortable, the clinician should stop and choose another approach or return later and try again. It is often best to apply small doses of OMT daily or even several times daily.” (<i>Somatic Dysfunction in Osteopathic Family Medicine</i>, p.131)</p>
<p>12. What are the outpatient, inpatient, and emergency room considerations?</p>	<p>Specific for the case of ileus, inhibiting sympathetic tone and stimulating parasympathetic tone should be considered in all settings. Emergency room and inpatient care should take greater consideration of patient comfort and therefore dose OMT appropriately.      The outpatient setting allows a more aggressive approach with less</p>

	frequency of OMT necessary. Outpatient follow-ups are also the most opportune times to discuss the bio-psychosocial issues affecting the patient's condition.
13. How are you going to talk to your patient about their complaint and your treatment?	Professional demeanor, combined with appropriate empathy is paramount in physician-patient communication. Simplicity and clarity will not only aid in understanding, but limit misunderstanding as well.  Short-term goals include resolution of symptoms and re-establishing regular bowel movements. Long-term goals include lifestyle changes, not limited to diet, in order to prevent recurrences.
14. How will you communicate your findings, diagnosis, and treatment to your preceptor?	Communication to the preceptor should be clear, concise, with pertinent positive and negative findings, and inclusive of differential diagnoses and a preliminary treatment plan.
15. What coding and billing information for evaluation and management and procedural services will you generate?	<ul style="list-style-type: none"> <li>• The diagnosis of somatic dysfunction in the assessment justifies the use of OMT</li> <li>• Somatic dysfunction diagnosis must be present in order to bill for the OMT that was performed. OMT is considered a procedure.</li> <li>• Documentation must reflect that the decision to perform OMT was made on that visit based on the physical findings and OMT was used for somatic dysfunction(s) identified</li> <li>• The procedure (OMT) and the E/M visit may both be billed with the same diagnosis code and during the same encounter if the decision to perform the procedure was made at the time of the encounter. Modifier -25 is used with the E/M code</li> </ul> <p><u>You must have a non-somatic dysfunction diagnosis included for this case</u>  <b>E/M-</b> Inpatient Consult-Comprehensive, Mod.- 99254    Inpatient Follow Up- Follow Up, Expanded- 99232  <b>Diagnosis-</b> Post Op Ileus- 560.1    SD- Head- 739.0, Cervical- 739.1, Thoracic- 739.2, Lumbar - 739.3, Sacrum- 739.4, Rib- 739.8, Abdomen - 739.9  <b>Procedure codes-</b> Manipulation 7-8 areas- 98928</p>
16. How would you record your encounter and OMT on your patient care logs?  (example is from New Innovations Research Management Suite ® )	<p>- Enter patient data, diagnosis date, and any special comments.</p> <p>- Indicate under "<u>Procedure Logger</u>" and "<u>View Procedures Logs</u>" your osteopathic manipulative treatment and check the following under "<u>Osteopathic Manipulative Treatment</u>" field</p> <p><input checked="" type="checkbox"/> Yes  <input checked="" type="checkbox"/> Biomechanical Factors  <input checked="" type="checkbox"/> Sympathetic nervous system responses  <input checked="" type="checkbox"/> Parasympathetic nervous system responses\  <input checked="" type="checkbox"/> Lymphatic and venous fluid congestion  <input checked="" type="checkbox"/> Pain Management  <input checked="" type="checkbox"/> Psychosocial factors, Stress Management  <input type="checkbox"/> No</p>

17. What questions would you formulate to evaluate this person's problems using an Evidence-Based Medicine approach? List the best evidence from the osteopathic literature and the general medical and scientific literature.

- **Townsend: Sabiston Textbook of Surgery, 17th ed.**, Copyright © 2004
- Litkouhi, B, Muto, MG. *Postoperative Ileus*. In: **Up-To-Date**, Rose, BD (Ed), Up-To-Date, Waltham, MA, 2006.
- Schubert, MJ. *Paralytic ileus: judicious use of osteopathic treatment offers valuable prophylactic and therapeutic modality*. The Osteopathic Profession 1950 Feb;17(5):15-17, 38, 40, 42, 44
- Kohn, H. *Ilopan and its usage*. The Journal of the American Osteopathic Association 1959 Jul;58(11):686-687
- Krettek, JM. *The Surgical Patient*. In: **Somatic Dysfunction in Osteopathic Family Medicine**, Nelson, KE (Ed), Glonek, T (AEd), Lippincott, Williams, & Wilkins, Baltimore, MD, 2007.
- Cashen, C, Ross, SP, *General Surgery*. In: **Foundations for Osteopathic Medicine**, 2<sup>nd</sup> ed., Ward, RC (Ed), Lippincott, Williams, & Wilkins, Baltimore, MD, 2003.

Evidence-Based Medicine (EBM) is the integration of best research evidence with clinical expertise and patient values, consistent with the legacy of Andrew Taylor Still "To improve the practice of medicine by understanding the true nature of the human patient" (Robert C. Davies, 2001). Evidence is found after appropriate search and a critical appraisal of the clinical and research evidence. The patient is educated about the evidence for the management chosen, but ultimately the physician will affirm the course of treatment based on clinical experience, patient's values and evidence available.

**The Process:**

1. Formulate a specific three part clinical question:

- What is the specific problem for this patient or patient population
- What intervention is sought?
- What is the desired outcome?

2. Search for the best evidence:

An appraisal of the osteopathic literature is critical to ensure the osteopathic paradigm is foremost in the philosophical application of information to patient care. Search of relevant and associated data from the osteopathic literature:

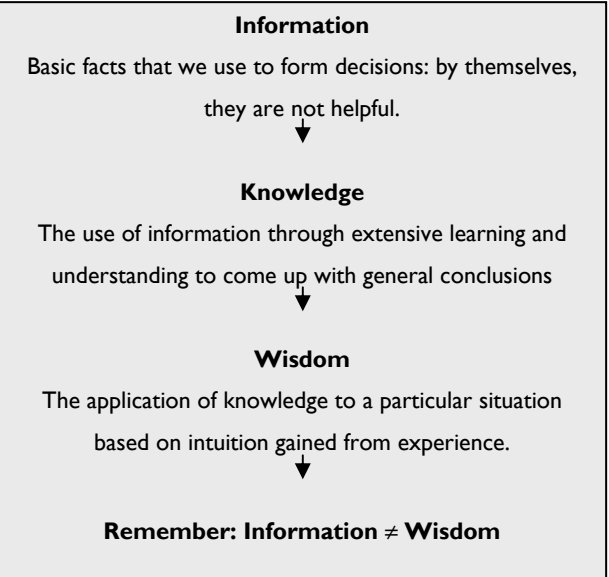
- OstMed (<https://ostemed.hsc.unt.edu/ostmed/>)
- AT Still Library Online Text (Portal)

Other literature bases (systems or synopsis engines):

- MD Consult (through ATSU Portal)
- Poems ([www.info poems.com](http://www.info poems.com))
- Up to Date ([www.uptodate.com](http://www.uptodate.com))

3. Critically appraise the evidence. The role of the physician is to bring superior knowledge and clinical wisdom to the patient problems

4. Apply the evidence to your patient. Evidence-Based Practice integrates individual clinical expertise with the best available external clinical evidence from systematic research, always bearing in mind "The relationship between the Osteopath and the patient is the heart of Osteopathy" (Podmore, 2001)



<ul style="list-style-type: none"> <li>• Family Practice Inquiry Network (<a href="http://www.fpin.org">www.fpin.org</a>)</li> <li>• PubMed Linkout (Portal)</li> <li>• Ovid</li> <li>• Google Scholar</li> </ul>	
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**Based on Box 20:** was there any evidence that OMT would be contra-indicated in this patient? Would the information retrieved modify the course of action for this patient as compared to Box 14?

***Section III: Workshop/Lab (approximate time 60–70 minutes)***

1. Participants divide into groups at the table
2. At each table, discuss and practice the appropriate palpatory diagnosis for this patient
3. Facilitator demonstrates the key treatment techniques:
  - Paravertebral muscle inhibitory pressure (rib raising); specifically at the thoracolumbar junction
  - Pectoral traction
  - Abdominal diaphragm fascial release
  - Gentle abdominal visceral manipulation
  - Sacroiliac gapping bilaterally
  - Sacral rocking
  - Cervical soft tissue and articulation (ME, S-CS, MFR, Still)
  - Suboccipital condylar decompression
  - Pedal pump
4. Participants should practice the techniques on each other
5. At each table, while the techniques are being practiced:
  - a. Identify and practice good body mechanics for the physician and patient in treatment
  - b. Discuss the treatment plan
  - c. Discuss what palpatory findings should change on the patient after OMM treatment

***6. Documentation:***

Students/Interns demonstrate an appropriate documentation of this case including findings and treatment here...

***Section IV: Final Wrap-up and Questions/Answers***