COILS

Clinical
Osteopathically
Integrated
Learning
Scenarios

Patient with
Pediatric Asthma

Prepared by: AACOM's Educational Council on Osteopathic Principles

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Part 7: Chapter 1

Pediatric Clinical Osteopathically Integrated Learning Scenario:

Patient With Pediatric Asthma

Description

This Clinical Osteopathically Integrated Learning Scenario (COILS) focuses primarily on the palpatory evaluation and supportive osteopathic manipulative treatment of a child who has asthma.

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. The 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 the entire two-section program at one time. Ideally, however, Section One should be taught several days before Section Two to allow time for 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 One: Roundtable Discussion Workshop

I. Description

This section is a roundtable-type presentation and discussion on the osteopathic approach to the treatment of a patient with pediatric asthma.

II. Cognitive Components

A. Case Presentation

A 10-year-old male presents with a complaint of difficulty breathing. He has been on the same medications for the past year and was doing well until about weeks ago. He cannot recall any instance in the past three weeks to explain the exacerbation of the symptoms. He believes that playing soccer increases his breathing difficulty.

The patient's family moved from the Southwest region of the United State to the community about a year ago after his father received a promotion. The patient is an excellent student and has played soccer for five years. He has an older brother who has no significant medical history. The family has had a cat living with them for the past eight years. The mother is a half-pack per day smoker who only smokes outdoors. The father has never smoked and had asthma in his youth but grew out of it by adulthood.

The patient was delivered vaginally at term and had no neonatal complications. He has no other significant surgical or hospitalization history. The patient developed asthma when he was 4 years old and has been well maintained on appropriate medications for this condition. He has no medical allergies and consumes dairy products daily.

Physical Examination

Vital Signs:	Temperature, 98.6° F; Blood Pressure, 80/54; Pulse, 68; Respiration Rate, 28
General:	Normal growth; well nourished; slightly pale; has "allergic shiners"
Eyes:	External ocular muscles intact; pupils equal, round, and reactive to light and accommodation; funduscopic exam without hemorrhages or exudate
Ears:	Tympanic membranes pearly gray
Nose:	Turbinates slightly engorged bilaterally; no nasal sinus drainage; positive nasal flaring with nasal horizontal crease noted
Throat:	No palpable thyromegaly; no enlarged lymph nodes
Cardiac:	Regular rhythm; no S3 or S4 sounds, murmurs, or rubs
Lungs:	Faint bilateral end-expiratory wheezes; no rales, rhonchi, or dullness to percussion

Abdomen:	Normal bowel sounds; no hepatomegaly, splenomegaly, or rebound tenderness
Extremities:	Full range of motion; no swelling or tenderness; pulses full and symmetric
Neuro:	Cranial nerves II–XII intact; DTRs 2+/4+ and symmetric; muscle strength 5/5; no sensory deficits in both upper and lower extremities
Oral:	Pink, moist, no tonsillar hypertrophy; uvula and tongue midline; facial muscle movements symmetrical and with normal motion

Diagnostics

- CBC normal
- Peak flow 70% of baseline
- PPD 0 mm
- CXR mild hyperinflation
- PFTs decreased FEV1

Osteopathic Structural Examination

- Cranial rhythmic impulse 12 cycles per minute, moderate amplitude of movement, sphenobasilar compression, petro-occipital sutural compression on the right
- OA flexed, rotated left and sidebent right
- Anterior tender point C1 on the right
- Posterior tender point C2 on the left
- C4 flexion, rotation, and side bending left
- T3 flexion, rotation, and side bending left
- Anterior tender points T2, T3, and T4
- Elevated ribs 1, 2, and 3 on the left
- T12 extension, rotation, and side bending right
- Ribs 1–5 on the left; inhalation rib somatic dysfunction
- Left radial head pronation
- Right hip extension with marked limitation
- Right inferior lateral angle of the sacrum is resistant to sacral rocking; downward pressure in prone position
- Lumbosacral motion poor; resistant spring test prone
- Right leg appears to be longer than the left; possible unlevel sacral base

The structural discoveries suggest other possible etiological factors that might explain the pathophysiological findings in this patient. Further questioning of the patient evoked recollection of several recent falls: fallen off of a trampoline about a month ago, landed on his left arm while playing soccer three months ago, and slipped on a wet concrete pathway (caught himself and did not fall down) five months ago.

B. Pathophysiology

1. Current research focuses on the inflammatory response in the mucus membranes. This includes abnormal release of chemical mediators such as eosinophil chemotactic factor, neutrophil chemotactic factor, and others.
2. Asthma can be triggered by allergic factors (e.g., airborne pollens, molds, and dust), infection (e.g., bronchitis, pneumonia, or upper respiratory infection), or irritants (e.g., smoke, fumes, or temperature changes).
3. If a patient has two different allergens (e.g., pollen and foodstuffs); simultaneous exposure worsens reaction.
4. Despite the cause, an inflammatory response ensues with mucosal edema, broncho-constriction, smooth muscle hyperplasia, mucus plugging, and hyperinflated lungs.
5. Treatment with the goals of decreasing sympathetic tone, thinning the mucus, and hydrating the ptient will encourage the cilia of the respiratory epithelium to work better and benefit the patient.
6. Anxiety worsens asthmatic reactions; cranial techniques can help decrease anxiety.

C. Functional Anatomy

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

1. A common bronchitic reflex is located at T3 on the right side.
2. Norman Larson, DO, discusses an asthma reflex at T2 left. Presumably, this was based on the visceral afferents from the lung following the bronchial nutrient artery, which is on the left side. If T2 and the second rib are involved, inhibitory pressure is the recommended treatment.
3. Andrew Taylor Still, DO talked about a tracheal “tension–retraction” or shortening in asthma patients. Myofascial release techniques for the anterior neck may be beneficial.
4. Overuse of the scalenes in an attempt to obtain more air can produce cervical and upper rib dysfunction.
5. Addressing the thoracic inlet to free the thoracic duct is important.
6. The temporal bones tend to favor internal rotation on the side of the upper rib dysfunction.

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. Help the patient to clear secretions. This is critical because retained mucus will stimulate bronchospasm.
2. Treating the viscerosomatic reflex, if present, is important. Inhibitory pressure is suggested.
3. The entire thoracic cage tightens in children, but compliance complications are minimal.
4. During an acute attack, a seated approach is more comfortable for the patient.
5. Calming the parent is beneficial to reducing the child's anxiety.

E. Contraindications and Cautions Regarding Treatment

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

1. Children may not cooperate with treatment or changing positions.
2. Laying the child flat will cause distress and potentially worsen hypoxemia.

F. Instructor's Notes

Personal clinical pearls and lessons learned from previous COILS presentations.

1. Robert Fulford, DO, pointed out that the sacrum will typically not move well on one side. The sacrum can be mobilized with sacral-rocking technique in the prone position (rhythmic downward pressure on the intubating laryngeal airway that has the most resistance until it loosens and regains the same compliance as the other side).
2. In the acute phase, inhibition OMM/OMT of the upper costovertebral joints may be needed to calm the sympathetic nervous system. Then stimulate the sympathetic chain ganglia with springing action of the costovertebral joints (pulsation) in the seated position to facilitate dilation of the bronchioles.
3. Mobilize the sacrum with rocking, pulsating, or vibratory motion.
4. Balancing the cranial, thoracic, and pelvic diaphragms is helpful in restoring normal respiratory motion in the cranium, cervical, thoracic, and lumbosacral spine. When there is alternating fluctuation of the temporal bones, OMM/OMT is beneficial for freeing up motion.

III. Psychomotor Components

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

A. Practice palpatory diagnosis (see techniques under Section D above), including cervical, upper thoracic and ribs, thoracic inlet, and anterior chest wall.

B. Demonstrate key treatment techniques in the body regions involved, including release techniques for the upper thoracics and ribs, OA myofascial release or indirect techniques, cervical techniques, myofascial and muscle energy techniques, and counterstrain.

C. Evaluate the plan for treating the patient in the appropriate position, localization of forces, and activation. Keep the techniques kind and gentle.

IV. References

Rowane WA, Rowane MP. An osteopathic approach to asthma. *J Am Osteopath Assoc*, 1999; 5:259-64.

Ward RC, Ed. *Foundations for Osteopathic Medicine*. Baltimore, MD: Williams & Wilkins; 1997:1015-1024.

V. Examination Questions

These multiple-choice questions involve the treatment of a patient with pediatric asthma.
(* denotes answer)

1. Which one of the following cranial dysfunctions is most commonly found in patients with asthma?

A. Sphenobasilar symphysis flexion pattern
B. Left side-bending rotation
C. Internally rotated temporal bones
D. Left torsion
E. Superior vertical strain

2. he upper thoracic dysfunctions affect the autonomic nervous system primarily by which of the following neural mechanisms?

A. Stimulation of the sympathetics
B. Inhibition of the sympathetics
C. Stimulation of the parasympathetics
D. Inhibition of the parasympathetics
E. Stimulation of both the sympathetics and parasympathetics

3. Which of the following key muscle groups would one most suspect is maintaining the somatic dysfunction of inhalation ribs on the left?

A. Scalenus anticus
B. Scalenus medius
C. Scalenus posterior
D. Pectoralis major
E. Pectoralis minor

4. he obstructive component of the patient's pulmonary problem can be influenced by which area(s) of somatic dysfunction?

A. Cervical somatic dysfunction
B. Thoracic somatic dysfunction
C. Cervical and thoracic somatic dysfunction
D. Lumbar somatic dysfunction
E. Rib cage somatic dysfunction

5. he restrictive component of the patient's pulmonary problem can be influenced by which area(s) of somatic dysfunction?

A. Cervical somatic dysfunction
B. Thoracic somatic dysfunction
C. Cervical and thoracic somatic dysfunction
D. Lumbar somatic dysfunction
E. Rib cage somatic dysfunction

Section Two: Patient-Based Application Workshop

I. Description

This section includes the practical application of osteopathic treatment techniques to support the pediatric patient with asthma.

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 philosophy and treatment technique.
3. Re-evaluation of the patient after treatment is completed to assess results. If a simulated patient is used, then the student or 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 Pediatric Patient with Asthma

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

EXAMINER: SIGNATURE DATE OF EXAMINATION

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

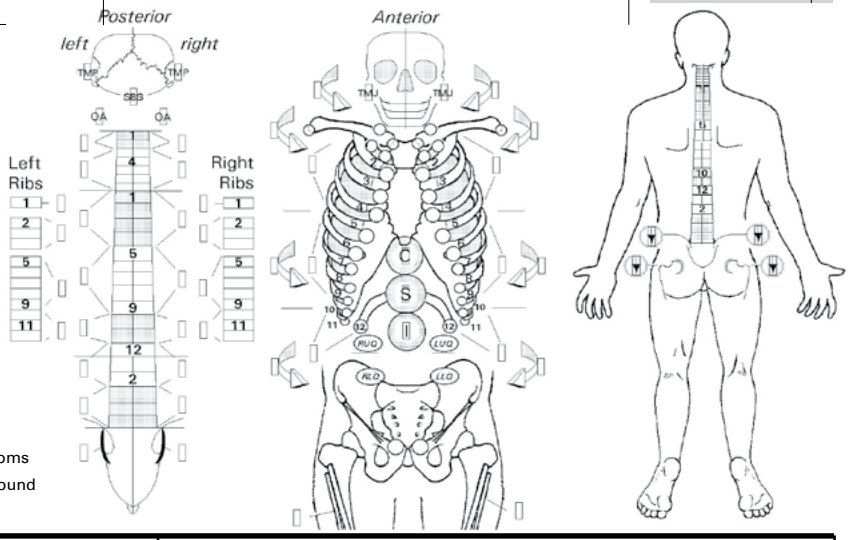
S Superior Mesenteric

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: