AUGUST 21-23, 2015
Loews Chicago O’Hare Hotel
Rosemont, IL

Breakout 1 - OMT for the Thoracic and Cervical Spine
Paul D. Giles, DO, MS
ACOFP FULL DISCLOSURE FOR CME ACTIVITIES

Please check where applicable and sign below. Provide additional pages as necessary.
Name of CME Activity: ACOFP Intensive Update and Board Review in Osteopathic Family Medicine
Dates and Location of CME Activity: August 20-23, 2015, Loews Chicago O’Hare Hotel, Rosemont, IL

Topic(s):
Bone-Up on Orthopedics
Sunday, 8/23/15
10:15-10:45 am

Saturday, 8/22/15
8:30-9:30pm

Table Trainer: OMT Case Reviews: Pre-test Session
Thursday, 8/20/15
7:30-9:00pm

Breakout 1 - OMT for the Thoracic and Cervical Spine
Friday, 8/21/15
2:45-4:15pm
Friday, 8/21/15
4:30-6:00pm
Saturday, 8/22/15
8:30-10:00am
Saturday, 8/22/15
10:15-11:45 am

Friday Evening Workshop #2
Examination Techniques for Office Orthopedics-Primary Orthopedics: What You Need to Know
Friday, 8/21/15
7:30-9:30pm

Name of Faculty/Moderator: Paul D. Giles, DO, MS

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☐ A. Neither I nor any member of my immediate family has a financial relationship or interest with any proprietary entity producing health care goods or services.
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☐ Ownership ☐ Partnership
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*If you checked “Speakers’ Bureaus” in item B, please continue:

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Signature: [Signature] Date: [Date]

Paul D. Giles, DO, MS

Please fax this form to ACOFP at 866-328-1835 or email to joank@acofp.org as soon as possible
Deadline: July 10, 2015
OMT REVIEW

THORACIC & CERVICAL SPINE
And Ribs

Paul D. Giles, DO, MS
ACOFP Intensive Board Review; 8/21/15

Borrowed from David Mason DO, FACOFP, TCOM OMM Chair (as indicated)
**Modified by Paul D. Giles D.O., M.S. 2015 (as indicated)

All images not otherwise specified c. Kathryn Brandt, 8/12/08

GOALS

● Principles OMT
● Brief clinical anatomy review
● Viscerosomatic Reflexes
● Basic treatment techniques
● “Practical Pearls:” incorporation into Family Medicine
Rules, Eponyms & Nomenclature

BARRIERS

- PHYSIOLOGIC
  - Limits of normal active ROM
- ANATOMIC
  - Limits of normal passive ROM
  - If you pass this you break something
- RESTRICTIVE/PATHOLOGIC
  - Loss of normal ROM creating limited new barrier
WOLFF’S LAW

- Calcium lays down on lines of stress
- Results in structural change like osteophyte or secondary arthritis
- Change in *anatomic* barrier
FRYETTE’S LAWS of SPINAL MOTION

I: Group vertebral curves
Rotation & sidebending occur to opposite sides Found in neutral

II: Single vertebral motion
Rotation & sidebending occur to the same side
Found in flexion or extension

III: Motion in one plane reduces ROM in other planes

FRYETTE’S LAWS of SPINAL MOTION
Law I: Group vertebral curves
Acted upon by long restrictors

- Rotation & sidebending occur to opposite sides
- Found in neutral
- Notation delineating group or apex of group e.g. T5-10 NSRRL
FRYETTE’S LAWS of SPINAL MOTION

Law II: Single vertebral motion acted upon by short restrictors

- Rotation & sidebending occur to the same side
- Found in flexion or extension
- Larger role in thorax than elsewhere
- Notation delineating motion of affected vertebra related to one inferior e.g. T6

FRYETTE’S LAWS of SPINAL MOTION

III: *Motion in one plane reduces ROM in other planes*

We use this to isolate to a specific vertebra
GENERAL EXAM
CERVICAL, THORACIC & SHOULDERS C/O
(rule out badness)

- Active & passive ROM cervicals & shoulder
  - Pay attention to thorax during shoulder abduction

- Brief neuro exam - emphasize motor

- Check anterior shoulder tenderness

Adson’s Test

- Used to diagnose thoracic outlet syndrome caused by scalenes
- Turn head towards the affected side
- Extend & externally rotate affected arm while palpating radial pulse
- Positive test is reduction, pause in or absence of pulse

### Wright’s Test
- Used to diagnose thoracic outlet syndrome caused by 1st rib/pec minor
- Rotate & sidebend head towards affected side
- Abduct affected arm while palpating radial pulse
- Positive test is reduction, pause in or absence of pulse


### Spurling’s Test
- Used to diagnose disc disease
- Axial compression of cervical spine with head tilted to ipsilateral side of pain reproduces symptoms

THORAX

VISCEROSOMATIC REFLEXES

- HEART
  - T1 - T4 (T4 L)
- LUNG
  - T2 - T7 (T3)
- STOMACH
  - T5 - T9 (T6 L)
- GALLBLADDER
  - T5 - T9 (T8 R)
- KIDNEY
  - T10 - T11
- OVARY/TESSE
  - T10 - T11
LANDMARKS

- T-1 prominent spinous process
- T-4 spine of scapula points
- T-8 inferior angle scapula

STRUCTURAL EXAM

- Most easily done seated
- Assess along transverse processes - look for rotation
  - Neutral
  - Flexion --> extended lesions
  - Extension --> flexed lesions
Figure Four

- Cross hands
- Thenar eminence on transverse processes
- Thrust anterolateral ("down & out")
Thoracic HVLA a.k.a “Kirksville Crunch”

- Best for extended type II dysfunctions
- Can be used for all
- Trick is ISOLATION

Position force through the elbows

- Stand side away from prominent transverse process
- Far elbow over near elbow
- Elbows on sternum or epigastrium of doctor
- Pillow may be helpful
Position fulcrum

- Use your body & pt’s elbows to maneuver

- Place inferior hand’s Thenar eminence on prominent transverse process
  - will provide fulcrum

ISOLATE

- Work in 3 planes
- Using pt’s head:
  - Flex down to lesion
  - Sidebend
  - Rotate
- Force of thrust through elbows
  - Treatment happens through fulcrum

- BE PRECISE
Variation

- Fulcrum is elbows
- Gap joint *around* dysfunction

SEATED POSITIONING

- Can be used for
  - HVLA
  - Muscle Energy
  - BLT
  - Still/FPR

Boyd Buser, D.O.: personal communication March 2005
Muscle Energy  ESRR

- Sit on the side you want to rotate *towards*
- “listening hand” on transverse processes
- Stabilizing hand across chest to opposite shoulder
- Sidebend towards you
- Rotate towards you
Muscle Energy NSLRR

- Sit on side you want to rotate towards
- Your shoulder under axilla of pt
- Sidebend away from you by sitting up (lift axilla with your shoulder)
- Rotate towards you
Alternate hold seated thoracics

Ribs

- **Structure**
  - Osseous
  - Cartilaginous
    - 10 attached
    - 2 floating

- **Function**
  - Protection
  - Respiration
    - Lungs
    - Lymphatics

- **Muscles**
  - Intercostal
  - Transversus Thoracis
  - Diaphragm
  - Rectus Abdominus
  - Quadratus Lumborum
  - Seratus
  - Pectoralis Minor
  - Scalenes
  - And many more…

- **Neurologic**
  - Sympathetic Access

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Ribs

- **Motion**
  - Upper Ribs
    - Pump Handle
  - Lower Ribs
    - Bucket Handle
  - Floating Ribs
    - Pincer/Caliper

- **Diagnosis**
  - Contact each rib throughout Respiratory Cycle with 1st four fingerpads
    - Anterior for Upper
    - Lateral for Lower
    - Posterior for floating
  - Inhalation vs Exhalation

- **Clinical Pearl**
  - Treat Thoracic Spine First

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Techniques

- **1st rib**
  - HVLA
  - Muscle Energy
  - Still/FPR

- **Typical Ribs**
  - HVLA
  - Muscle Energy
  - BLT

- **Floating Ribs**
  - Muscle Energy
  - BLT

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Exhalation Ribs

- Exhalation dysfunction aka. Inhalation restriction.
- May be one but usually a group of ribs stuck in exhalation.
- Treatment addresses Most cephalad rib as key rib.
- Use respiratory effort and accessory muscles of inhalation to assist with treatment.

Exhalation Dysfunction:

1\textsuperscript{st} Rib – Pump Handle Motion

Pt. supine head straight (anterior scalene).
Pt. hand on forehead.
Dr. hand on pt hand.
Pt. lifts head,
Dr. resists.
Dr. lifts posterior rib 1.
Deep inspiration.
Repeat 3-5 times.
**Exhalation Dysfunction:**

**1st Rib – Bucket Handle Motion**

Pt supine Head turned 40' away from side of Dysfunction (middle Scalene).
Hand on forehead.
Dr. Hand on hand.
Lift head,
Dr. Resists and uses other Hand to raise posterior Rib 1.
Deep inspiration.
Repeat 3-5 times.

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**Exhalation Dysfunction:**

**Upper Ribs – Pump Handle Motion**

Pectoralis Minor
Dr. resists pt. effort to lift arm.
Caudad hand pulls Affected ribs Anterior and Lateral with pts.
Deep inhalation.
Repeat 3-5 times.
Exhalation Dysfunction:

**Middle Ribs – Bucket Handle Motion**

**Serratus Anterior**

Dr. resists pt. Effort To lift arm.

Caudad hand pulls Affected ribs Anterior and Lateral with pts.

Deep inhalation. Repeat 3-5 times.

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Exhalation Dysfunction:

**Lower Ribs – Bucket Handle Motion** *(Latisimus dorsi)*

Dr. resists pt. Effort to move Elbow toward feet.

Caudad hand pulls Affected ribs Anterior and Lateral with pts.

Deep inhalation. Repeat 3-5 times.
Exhalation Dysfunction:

Floating Ribs (11 & 12)

Patient prone. Dr. on side opposite Dysfunction. Legs towards doctor. Roll pelvis posterior With ASIS of side of Dysfunction. Doctors cephalad Hand pushes ribs 11-12 Away with assist of Inhalation. Repeat 3-5 times.

Inhalation Rib Dysfunctions

- Inhalation dysfunction aka Exhalation restriction.
- May be one but usually a group of ribs stuck in inhalation.
- Treatment addresses Most caudad rib as key rib.
- Use respiratory effort and muscles of exhalation to assist with treatment
Inhalation Dysfunction:

1st and 2nd Rib

Dr. puts thumb on Rib 1 or Rib 2 Flex and side bend neck toward Dysfunction.

Assist Expiratory effort.

Repeat 3-5 times.

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Inhalation Dysfunction:

2nd thru 5th Rib

Dr. places palm on Anterior ribs.

Flex and side bend neck.

Assist expiration. Repeat 3-5 times.

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Inhalation Dysfunction:

**6th thru 10th Rib**

- Dr. places palm on lateral ribs.
- Side bend head and torso.
- Assist expiration. Repeat 3-5 times.

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Inhalation Dysfunction:

**11th and 12th Rib**

- Patient prone. Dr. on side opposite Dysfunction.
- Legs **away** from doctor. Doctor’s cephalad hand pushes ribs 11-12 Anterior with assist of **exhalation**.
- Repeat 3-5 times.

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Vertebral Artery Issue

- Incidence “adverse event” varies with study
  - 1:400,000 - 1:3.8 million
- Incidence serious event 6.39 per 10 million
- Higher risk with rotatory technique
- Higher risk hypercoagulable women
  - OCP
  - pregnancy

NSAID Toxicity

- Vascular effect cervical manipulation
  - 1:400,000 = 0.00025%
- “serious” GI Effect:
  - Cox -1 = 1.3 - 1.9%
  - Cox - 2 = 0.18%

※Detail-Document; Prescriber’s Letter 2000; 7(1):160117
A gentle way to pick up the head

“Universal Hold” C-3 - T1

- Can be used for
  - HVLA
  - Muscle Energy
  - BLT
  - Still/FPR
  - General Articulatory Technique
“wrap around the pylon”

- Diagnose by translating lateral tubercles
- MCP or PIP on side of resistance - ie side you want to sidebend towards = fulcrum or “pylon” finger
- Use opposite hand to introduce head to palm of fulcrum hand
A Note on T1

- Use same hand positioning as typical cervical vertebra
- Dysfunction tends to be Type I

SO

- Treat sidebending & rotation separately

C2

- Treatment is rotation
- Be careful to isolate to C2, not thorax
- Reduce lordosis to do so
OA: Suboccipital Tension Release

- This feels good
- Fingers along superior nuchal line
- Gentle traction, weight of head does treatment
- BE SURE YOU ARE REDUCING NOT INCREASING CERVICAL LORDOSIS

OA: Muscle Energy

- Sideslipping = other word for Type I mechanics
- Isolate to OA using traction, flexion
- Translate in direction doesn’t want to go
- Use oculocephalic reflex as muscle contraction
PRACTICAL PEARLS

- Treat what you find
- Use fascia to tell you where to treat
- If it’s tender, use counterstrain, FPR or Still Technique - much faster

PRACTICAL PEARLS

- Don’t forget about anterior line
- If you “bounce off” or can’t isolate something for HVLA it’s likely not a bone problem - change technique
PRACTICAL PEARLS

- Many cervical dysfunctions aren’t from the vertebrae look to the
  - Clavicles
  - Ribs
  - Upper thorax
  - Hyoid

- Don’t be afraid to improvise

BIBLIOGRAPHY

- American Osteopathic Association/Academy of Osteopathy position paper on osteopathic manipulative treatment of the cervical spine Ken Johnson, DO and George Pasquarello, DO; Adopted March 19, 2003 by AAO Board of Governors
- University of New England College of Osteopathic Medicine OP&P Handouts 1993
- Many thanks to Danielle Saad, D.O. & Dustin Sulak, D.O. - models