Osteopathic Medicine
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Primary Care Sports Medicine
Family Medicine

“Osteopathy is the practical knowledge of how man is made and how to right him when he gets wrong”
-AT Still

Objectives

• Define Osteopathy
• Describe characteristics of an appropriate osteopathic referral
• Discuss the kinematic chain and treatment process
• Identify common injuries and how osteopathy can be applied to treat them
Doctor of Osteopathy

• D.O.
  • Fully licensed osteopathic physician
  • Specialize in all areas of medicine
  • Founded on philosophy of treating people, not just symptoms

Is There a Difference?
MD vs DO

• D.O. – Doctor of Osteopathic Medicine
• M.D. – Doctor of Allopathic Medicine

Similarities M.D. vs D.O.

• Four-year undergraduate degree w/ emphasis on scientific courses
• MCAT
• Four years of Medical School
• Graduate medical education (internship/residency)
• Any specialty area of medicine- pediatrics, family practice, psychiatry, surgery, obstetrics…
• COMLEX vs USMLE
• Obtain state licenses to practice medicine
• Practice in fully accredited and licensed health care facilities
Osteopathic Facts

• Fastest growing segments of health care professionals in the United States

• 10 states (Virginia, South Dakota, Wyoming, North Carolina, Utah, Minnesota, Oregon, Louisiana, Tennessee, Idaho) Experienced greater than 45% growth in the number of DOs between 2009 and 2014

Osteopathic Facts

• 109,836 total D.O.s and Osteopathic medical students (May 31st 2014)
• 60% D.O.s specialize in primary care - FM, IM, OB and peds
• As of 2013-14 academic year
  – 30 accredited colleges
  – 38 teaching locations in 28 states

Osteopathic Philosophy and Principles

• The human being is a dynamic unit of function
• The body possess self-regulatory mechanisms, which are self healing in nature
• Structure and function are inter-related at all levels
Osteopathic Techniques

• Broad range of gentle hands-on techniques: soft tissue stretching, deep tactile pressure, and mobilization/manipulation of joints
  – Muscle Energy
  – Strain-Counterstrain
  – Myofacial release
  – HVLA
    (high velocity, low amplitude)
  – Articulation

Currently Used to Address

• Pain
• Increase mobility
• Asthma
• Sinus problems
• Carpal tunnel syndrome
• Migraines
• Dysmenorrhea
• Can complement—and even replace medications
What Does the Literature Support?

- Increasing numbers of RCTs
- Published mostly in JAOA and PT journals
- NIH literature summary

Thumbs up or Thumbs Down?

- 65 year old male with pneumonia
- Admitted to the hospital
- On IV antibiotics
- HTN controlled, on a statin, otherwise healthy, active, has 3 grandkids that he watches once a week

Efficacy of OMT as an adjunctive treatment for hospitalized patients with pneumonia:

- The Multicenter Osteopathic Pneumonia Study in the Elderly (MOPSE)
- Double-blinded, randomized, controlled trial
- Assess the efficacy of osteopathic manipulative treatment (OMT) as an adjunctive treatment in elderly patients with pneumonia
406 subjects aged ≥ 50 years hospitalized with pneumonia

- conventional care only (CCO)
- light-touch treatment (LT)
- OMT groups

- Intention-to-treat (ITT) analysis (n = 387) found no significant differences
- Per-protocol (PP) analysis (n = 318)
  - significant difference between groups (P = 0.01)
    - Duration of IV abx and death or respiratory failure were lower for the OMT group versus the CCO group, but not versus the LT group

Conclusion

- When OMT was compared to conventional care the Per Protocol analysis found significant reductions in
  - length of hospital stay
  - duration of intravenous antibiotics
  - respiratory failure
  - death
- Given the prevalence of pneumonia, adjunctive OMT merits further study

Thumbs Up or Thumbs Down?

- 33 year old Male
- “Pulled back out while doing a dead lift”
- Works as a financial analyst
- Works out at the gym a lot
- Tried rest, nsaid, heat/ice, gradual increase of activity over last 4 weeks
- No radicular signs or symptoms, neg red flags, Just some nagging pain
- Otherwise healthy
Thumbs Up or Thumbs Down?

- 62 year old farmer
- "Pig Corralling" One got away on me…
- HTN, DM, ^lipids: well controlled
- Body type: Pot Belly
- Worst pain ever, can hardly get on the exam table
- No red flags, Neg radicular Symptoms

Thumbs Up or Thumbs Down?

- 68 year old female
- Nagging back pain- comes and goes
- Hypothyroid
- Otherwise healthy, goes to curves 5x per week
- Back pain off and on over the years, hurts into the SI joint and the hips
- No red flags, no radicular symptoms

Less PT and Medications

New England Journal of Medicine, Nov 4, 1999

- RCT trial for management of Sub Acute LBP
  - 1193 patients
  - Standard treatment vs. treatment with OMT
  - Outcomes:
    - Use of medication lower in OMT group
    - Use of Physical Therapy lower in OMT group
Better Long term functionality and pain improvement

- Randomized Controlled Trial
  - 1334 patients, LBP as chief complaint
- OMT vs. OMT plus exercise
- Outcome:
  - “OMT + exercise” has greatest long term benefits

Spinal Manipulation

- NIH Review

Spinal Manipulation- LBP

- One of several options that can provide mild-moderate relief from low back pain
  - self care, acupuncture, exercise, medications
- Fairly safe when applied by licensed and trained practioner
- Common side effects:
  - minor discomfort in area treated, go away in 1-2 days
- Serious complications: rare
Cauda Equina syndrome (CES)

- Significant narrowing of the lower part of the spinal canal
  - nerves become pinched, pain, weakness, numbness, bowel or bladder problems,
  - may be an extremely rare complication of spinal manipulation
- However, unclear if there is actually an association between spinal manipulation and CES

Chronic and Debilitating Back Pain

- Most back pain is self limiting
- Challenging to diagnose and treat
- Total annual costs of low-back pain in the United States
  - lost wages + reduced productivity—> $100 billion

Spinal manipulation

- Chiropractors, osteopaths, natropaths, physical therapist and some MD’s
- Practitioners apply a controlled force to the joint of the spine
- Goal: relieve pain, improve functioning
2007 guidelines: American College of Physicians and the American Pain Society

• Included spinal manipulation as one of several treatment options for practitioners to consider when low-back pain does not improve with self-care

What does the Science Say?

• NIH reports

2010 Agency for Healthcare Research and Quality (AHRQ) report

• Complementary health therapies, including spinal manipulation, offer additional options to conventional treatments

• The AHRQ analysis also found
  – Spinal manipulation was more effective than placebo
  – As effective as medication in reducing pain intensity

• Researchers noted inconsistent results when comparing spinal manipulation with massage or physical therapy to reduce low-back pain intensity or disability
2011 Review of 26 clinical trials

- Looked at the effectiveness of different treatments, including spinal manipulation, for chronic low-back pain
- The authors concluded that spinal manipulation is as effective as other interventions for reducing pain and improving function

2008 Review

- Focused on spinal manipulation for chronic low-back pain
  - Strong evidence that spinal manipulation works as well as a combination of medical care and exercise instruction
  - Moderate evidence that spinal manipulation combined with strengthening exercises works as well as prescription nonsteroidal anti-inflammatory drugs combined with exercises
  - Limited-to-moderate evidence that spinal manipulation works better than physical therapy and home exercise

On Going Research

- Whether the effects of spinal manipulation depend on the length and frequency of treatment.
  - NCCIH funded study: examined long-term effects in more than 600 people with low-back pain, results suggested that chiropractic care involving spinal manipulation was at least as effective as conventional medical care for up to 18 months
  - However, less than 20 percent of participants in this study were pain free at 18 months, regardless of the type of treatment used
On Going Research

• How spinal manipulation affects the body
• NCCIH-funded study
  – small group of people with low-back pain, spinal manipulation affected pain perception in specific ways that other therapies (stationary bicycle and low-back extension exercises) did not

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Thumbs Up or Thumbs Down?

- 18 year old gymnast
- Inversion ankle injury doing round off
- Swollen over lateral ankle, decreased ROM, negative anterior drawer test
- Negative Ottawa Ankle Rules (no fracture)

Ankle sprain - study

- OMT in the ED
  - Patients 18 or older with unilateral sprains
  - Randomized to two groups
    - One with standard care
    - One with standard care + OMT
- Results
  - Statistically significant decrease in edema
  - Statistically significant decrease in pain
  - Follow up
    - Both study groups = significant improvement
    - OMT group - statistically significant increase in ROM
Thumbs up or Thumbs down?

- 29 year old female with LBP and SI joint pain that sometimes radiates to the pubic bone
- 6 weeks postpartum
- Works as a nurse on med surg floor
- No numbness or tingling, negative neural tension, normal reflexes, otherwise normal exam

OMT in Women w Postpartum Low Back Pain and Disability: Randomized Controlled Trial

- 80 women aged between 23 and 42 years
- 40 in OMT group, 40 in control group
- Between-group comparison of changes revealed a statistically significant improvement in pain intensity in the OMT group and level of disability

Thumbs Up or Thumbs Down?

- 37 year old healthy female with Left sided shoulder pain, medial border of the scapula pain x 6 months
  - Can’t remember injury, maybe the gym? Swimming?
- Some swelling just above the left clavicle
  - 2/2 adjustment/deep tissue work from massage?
- PE: FROM shoulder, Full strength shoulder/UE, +impingement signs, FROM Neck, DTR UE +2/4, arm color different? Neg Addison's
- ROS: negative except cough and allergies this summer
Thumbs Down

• Neck xray: normal
• CXR: White Left Lobe Mass
• Sent for CT scan, then bx
• Dx: lymphoma

Thumbs Up or Thumbs Down

• 41 year old centrally obese female
• PHx: HTN, weird MSK pains, Cervical radicular pain, Carpal Tunnel, Lumbar radicular pain, pre-diabetic, high cholesterol
• New onset mid back pain, different from the neck and lumbar pain

Thumbs Up or Thumbs Down

• PE:
  • DTR: +2/4 bilaterally
  • MS: +4/5 diffusely on the left
  • Sensation decreased up to the abdomen
  • Previous MRI lumbar reviewed, read as multi-level DDD
Thumbs Down

- MRI thoracic: Dissecting thoracic aortic aneurism
- Other dx I have been sent…
  - Brain Tumor
  - MS
  - Spinal Menigoma

Thumbs up or Thumbs down?

- 32 year old female
- PMHx: Fibromyalgia
- Sochx: works as a dancer
- Meds: Tramadol/vicodin that her uncle, an orthopedic surgeon prescribes for her, lyrica and similar medications make her “crazy”
- Complaint: multiple different MSK complaints

What it does not work well for…

- Chronic pain
- Fibromyalgia
- Radicular pain
Restriction of Joint Motion

- **Acute Causes**
  - Muscle spasm
  - Joint effusion
  - Soft tissue swelling
  - Synovial fold entrapment

Restriction of Joint Motion

- **Chronic Causes**
  - Fibrosis
  - Ligament shortening
  - Muscle contracture
  - Degenerative changes

Somatic Dysfunction

- Restricted or altered function of the body framework and its related elements

- A Functional Disorder:
  - Once somatic dysfunction is diagnosed and removed, normal function restored and no permanent pathologic changes remain

- Restrictive barrier not found in a normal joint
Abnormal Changes of Somatic Dysfunction: TART

- **T**: Tissue Texture Change
- **A**: Asymmetry
- **R**: Restricted Range of Motion
- **T**: Tenderness

**Barrier Concept**

- Anatomic Barrier
- Physiologic Barrier
- Neutral point
- Range of Motion
- Active Range of Motion
- Passive Range of Motion
Barrier Concept

- Restrictive or pathologic barrier: is the end point of motion with motion loss of somatic dysfunction
- Normal midline, neutral point, shifted to a new position in presence of somatic dysfunction

Techniques

- Direct
  - Engage the restrictive barrier
  - Activating force carries dysfunctional component through the restrictive barrier
  - Muscle Energy
  - High Velocity
  - Articulatory
  - Soft Tissue
  - Myofascial

- Indirect
  - Move dysfunctional component away from restrictive barrier
  - Position of freer motion
    - Counterstrain
    - Myofascial release

Strain-Counterstrain

- Tender point located
- Patient is placed into the direction of ease or position of comfort
  - shortens the hypertonic
  - allows reflex relaxation
- Reduces hypertonicity
Counterstrain

- On field
  - Acute overuse injury, immediate pain relief
  - Cramping on field

Muscle Energy

- Direct Technique
- Patient contracts muscle fibers in a specific direction against a set counterforce

Muscle Energy

- Striated muscle has a control system – the muscle spindle
- Muscle spindle contains fibers that determine its length
- Joint restriction may be from shortened muscle – Muscle spindle reports increased tension and therefore muscle spasm

- Treatment
  - Muscle lengthened to barrier
  - Patient contracts muscle
  - After contraction stops muscle spindle reports less tension
  - Gain on muscle is reduced and muscle allowed to be lengthened
  - Causing the muscle spindle to be reset
Muscle Energy Uses

- Gymnast
- Musician
  - poor flexibility of postural muscles
  - leads to muscle strain/spasm
- Balance discrepancy between agonist and antagonist muscles
  - from deconditioning
  - hypertonicity in opposing muscle groups.

HVLA (high velocity low amplitude)

- Dysfunctional joint into the restrictive barrier
- Short and gentle impulse/thrust through restrictive barrier
- Restores normal physiologic ROM
  - decrease in muscle hypertonicity
  - often decrease in pain

Advantage of HVLA

- Effective when time is limited
- Often relieve discomfort quickly
- Should also be given exercises
- Example: pitcher who throws 200 innings a year w/ chronic thoracic dysfunction
Kinetic Chain: Definition and Concept

• The lower extremity as a series of mobile segments and linkages which allow forward propulsion during gait

The Big Picture:

• How does Kinetic Chain Dysfunction explain injuries??
Kinetic Chain:
Open
• The foot is off the ground
• All joints can move independently of each other

Kinetic Chain: Closed
• The foot is in contact with the surface
• Motion at one joint results in obligatory coupled motions at other joints

Kinetic Chain Dysfunction:
• Abnormal motion at one segment may lead to compensatory movement changes and abnormal stress at another
Kinetic Chain Dysfunction: Joint Mobility

• Hypomobility → other joints forced to move beyond their normal functional range resulting in increased stress on muscle tendon units

• Hypermobility → other joints forced into an abnormal position, creating increased stress on supporting muscle tendon units

What is normal mobility / flexibility?

• Varies across populations
• Normal is uninjured side

Kinetic Chain Dysfunction: Symmetry

• Always compare with the contralateral side

• Most people are born symmetric

• Unilateral increased pronation, hallux valgus, external rotation, lateral patellar tracking etc should be a clue to a dysfunction
Kinetic Chain Dysfunction: Injury

- May be secondary to another injury or dysfunction at a distant site

- Culprit vs Victim

- The knee is frequently the victim (and rarely the culprit) in overuse injury

Kinetic Chain Dysfunction: Injury

- Screen the entire chain

- Especially important with recurrent injuries to the same site or limb

- The foot, hip and pelvis are the most important sites of KCD leading to overuse injuries

Kinetic Chain Example

- Stand up
- Place fingers under ASIS
- Pronate your left foot
- Supinate your right foot
- Feel right ASIS drop anterior/inferior
- Body weight shifts over left posterior/superiorly rotated innominate
- You should feel pelvis rotate left
SI Joint Dysfunction

- Leads to rotation and functional symmetry of pelvis, resulting in relative internal rotation of one hip and relative external rotation of the other

SI-Dysfunction Etiology

- Fall onto knee or buttock
- Mis-step - missing step with axial load on leg
- MVA with foot firmly on brake
- Twisting
- Habitual posturing - occupational, holding infants, athletics

SI Dysfunction: Importance of Treatment

- SIJD must be corrected to normalize biomechanics and allow for proper knee / patellar tracking and reduce obligatory rotational stress on the lower leg
- Failure to do so will result in serial injuries to the same sites or same extremity
SI Dysfunction Clinic Findings

- Hallmark is asymmetry
- Position of Pelvic landmarks - ASIS, PSIS
- Tilting of sacrum
- Functional asymmetry of:
  - Hip range of motion
  - Leg lengths supine vs long sitting
  - Hamstring flexibility

SIJD: Making the Diagnosis

- Clinically you must have a completely normal neurologic examination
- Nerve tension signs generally negative
- It is often useful to correct the dysfunction and see what effect it has on pain before proceeding with further imaging
  - If patient improves likely the SI joint
  - If no improvement SIJD likely secondary

SIJD: Investigations

- Imaging controversial and of little use in SIJD
- Plain films after 6 weeks of failed conservative therapy
- Exception: neurologic signs / symptoms of infection or neoplasm
Why Won’t the SI Joint Stay Level

- Poor compliance with exercise
- Habitual static and dynamic positioning
- Inappropriate lifting and carrying

Why Won’t the SI Joint stay Level?

- Occult disc
- Tight hip capsule
- Intra-pelvic pathology
  - Ovarian pathology
  - Endometriosis
- Uncorrected rotation of L5 on S1
- Uncorrected deviation of the coccyx

SIJD and Distal Injury

- SIJD
- Asymmetric hip ROM
- Abnormal gait
- Poor patellar tracking
- Increased pronation
- INJURY & PAIN
SIJD and Hamstring Pain

• As innominate rotates anteriorly hamstrings are tensioned

• SIJD frequently accompanies acute hamstring strain – correction may reduce pain

• SIJD often culprit in hamstring pain arising
  – Without specific incident
  – Without bruising / defect / focal pain

• Also consider referred pain from L5 or S1

SIJD and IT Band Friction Syndrome

• SIJD may be chicken or egg, but virtually all IT Band patients have an SIJD

• ? Changes to mechanical efficiency of hip abductor musculature

• ITBFS is NOT a stretching problem, it is an SIJD and hip abductor weakness problem

Summary before Questions

• Osteopath:
  – Fully licensed physician, any specialty
  – 60% go into primary care

• Who to refer and not to
  – Complete the work up

• Somatic Dysfunction
  – Restrictive barrier

• Kinematic Chain
  – How joint motion effects motion of another

• SI joint dysfunction
Questions?

Thank you,
Melissa Novak, DO

References

- http://www.osteopathic.org/
- http://nccam.nih.gov/health/whatiscam/manipulative/manipulative.htm#