Yoga for Low Back Pain & Rehabilitation

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OBJECTIVES

❖ Describe how yoga may be beneficial for the care and rehabilitation of patients with low back pain
❖ Identify yoga as a system of health promotion
❖ Describe ideas central to the practice of yoga
❖ Compare and contrast yogic principles with osteopathic philosophy and practice
❖ Review literature for yoga for low back pain
❖ Identify yoga best for patients with low back pain
DISCLOSURES

- Dr. Pierce-Talsma has no financial interests or relationships to disclose

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- The speaker does not endorse any product, service or device with this presentation
D.O. - Michigan State University
RYT - Cape Elizabeth, Maine
Yoga Therapy - Current student, Niroga Institute
“The vast majority of low back pain cases are of unknown origin and are classified as non-specific”\textsuperscript{12}

Low Back Pain

- Major reason why people use Complementary and Alternative Methods (CAM)
- Secondarily suffer anxiety, depression, disability, reduced quality of life
- Causes are not well understood and therapy frequently fails
“The pain response is due to the loss of load attenuating capacity of multiple tissues that must work in concert together”

Functional Anatomy

- Difficult to identify the source of pain
- Structural vs. Functional
- Lumbar musculature as spinal stabilizers
- Retraining should target multiple muscles that influence spinal loading
Anatomic Considerations - Ligaments

Standing S. Gray’s Anatomy the anatomical basis of clinical practice. Elsevier 2016
Anatomic Considerations

Innervation
Anatomic Considerations
Muscles

Standing S. Gray's Anatomy the anatomical basis of clinical practice. Elsevier 2016
Thoracolumbar Fascia System

- Three layers
  - Posterior
  - Middle
  - Anterior
- Point of attachment for abdominal musculature (EO, IO, TA)

Standing S. Gray’s Anatomy the anatomical basis of clinical practice. Elsevier 2016
Muscles of the LE, Pelvis, Abdominals

- Strengthening of the Pelvis and LE muscles is important for rehabilitation due to muscular, fascial and ligamentous linkages
- Fascia Lata system
- Iliopsoas as a stabilizer

Standing S. Gray’s Anatomy the anatomical basis of clinical practice. Elsevier 2016
To Rehabilitate Low Back Pain

- Form Closure
- Force Closure
- Neural Function
- Motor control
- Emotional State
- Body Awareness

“Multidimensional approaches that incorporate the dimensions of physical, psychological, and social function, are now generally accepted as better determinants of the individual’s experience with pain.”

- Vleeming et al\textsuperscript{24}

- Galantino et al.
“The study of asana is not about mastering Posture. It’s about using posture to understand & transform yourself.”

Can My Patients Do Yoga?

I hope to prove to you today that yoga is for EVERY BODY
Utilization of Yoga

“Yoga does not just change the way we see things, it transforms the person who sees.”
- B.K.S. Iyengar

Yoga- The 8 Limbs

1. Yamas- Restraints
2. Niyamas- Observances
3. Asanas- Postures
4. Pranayama- Breath work
5. Pratyahara- Inhibit the senses
6. Dharana- Concentration
7. Dhyana- Meditate on the truth
8. Samadhi- Union with the divine
A-B-C’s by Niroga Institute

**Centering**
The essence of Mindful Centering or meditation are “open monitoring,” or noticing our thoughts, and “focused attention,” or concentrating on one thought or thing at a time. Regular practice of meditation improves critical thinking and productivity, and it also foments contentment.

**Breathing**
Through Mindful Breathing we can activate the parasympathetic nervous system, which is responsible for the body’s ability to recuperate and return to a balanced state after experiencing pain or stress. In addition, Mindful Breathing helps us control and regulate our emotions.

**Action**
Mindful Action helps heal trauma and reduce/manage stress stored in the body.
Yoga’s Mechanical Attributes

❖ Rest
❖ Flexibility
❖ Strength/Endurance
❖ Correct action
❖ Alignment
❖ Postural Awareness
❖ Proprioception/Balance

“These Movements are “intricate” and highlight the mind-body nature of Yoga that emphasizes awareness, concentrations, and bidirectional communication between the mental, nervous, skeletal and muscular systems”.
Rest

- Rest and relaxation of the affected area
- Awareness of where you are holding tension

**Restorative Yoga**
- Total relaxation
- Uses props to allow for surrender into the pose

**Yoga Nidra**
- A guided meditation-”yogic sleep”- deep relaxation while still remaining conscious

**Yin Yoga**
- Slow yoga with LONG holds- 5 minutes or longer
- Passive postures that target deep connective tissue stretching
Flexibility

- Reciprocal inhibition
- Breath as activation
- Long holds in stretches
  - Affects intrafusal muscle fibers and golgi tendon
- Range of Motion work
- Stretching what is tight
Strength/ Correct Action

- Working against gravity
- Isometric contraction
- Balance of left and right hemispheres
- Engagement of core muscle groups
Alignment/Postural Awareness

- Release of subconscious gripping
- Self-knowledge
- Asymmetry
- Correct posture
- Identification of tendencies/patterns
- Strength to hold correct posture
Renewed Body Awareness

“Pain Distorts individuals’ body perception by demanding attention, blocking their awareness of non-painful body parts. This is even measurable on the cortical level, where the painful body part becomes overrepresented, influencing perception of form and position of the body in space.”

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Interoception- Looking Within

“We are a geometry of somatic consciousness”

~ Stanley Keleman

- **Proprioception** - reception of stimuli - body position in space
- **Kinesthesia** - a sense mediated by muscle tension and movement
- **Visceral Sensation**

“Without the unimpeded perceiving of these sensations, it simply is not possible to know who you are and what you need in life.”

~ Peter Levine
Proprioception

- Sensorimotor System
  - Altered input = altered output
- Balance
- Concentration
Exercise Prescription

Upper and Lower Crossed Syndromes

- Retrain Proprioception
- Stretch what is tight
- Strengthen what is weak
Yoga’s Physiological Benefits
“Breath is the King of the Mind”
~B.K.S Iyengar

The Breath-Pranayama

- Reduces dead space ventilation
- Decreases sympathetic tone
- Down regulates the HPA access
- Calms the mind
- Alters fascial tensions
- Combined with asana can change ventilation to perfusion ratio in different parts of the lungs
How Does Breathing Affect LBP?

- **Hyperventilation or Breathing Pattern Disorder**
  - Increases Respiratory Alkalosis
  - Increases sympathetic tone
  - Alters serum calcium and phosphate
  - Increases anxiety
  - A shift from a diaphragmatic to a thoracic breathing pattern
  - Increased tension in muscles of thoracic breathing
  - Increase in excitability of the corticospinal system

“During moderate hyperventilation, loss of CO2 ions from neurons stimulates neuronal activity, causing increased sensory and motor discharges, muscular tension and spasm, speeding of spinal reflexes, heightened perception (photophobia, hyperacusis) and other sensory disturbances.”
A Few Physiologic Responses

- Serotonin- increases
- BDNF- increases
- GABA-increases
- **Autonomic Balancing**
  - Decreases salivary cortisol
  - Decreases 24-h urine NE/EPI levels
  - Decreases HR, BP
  - Decreases pro-inflammatory cytokines
- Increases antioxidants

Sherman et al. Mediators of Yoga and Stretching for Chronic Low Back Pain. *Evidence-Based Complementary and Alternative Medicine*. 2013
Resilience vs Vulnerability

- Promote Health
- Physical Resilience
- Emotional Resilience

“What ever happened to mental hygiene?”

“We don’t teach children how to be resilient, how to cope with stress on a daily basis”
Yoga- Mechanisms of Action-Psychological

- Group intervention- motivation
- Relaxation, stress management, coping skills
- New Awareness/Learning
- Identification of emotional response to pain
- Self-efficacy
- Cognitive Behavioral Treatment

“Treatment with MBSR (yoga) or CBT compared with usual care resulted in greater improvements in back pain and functional limitations at 26 weeks”\textsuperscript{18}
Be Here Now

Past

Future

Present

Past

Future

∞
“We look at the body in health as meaning perfection and harmony, not in one part, but in the whole.”

—A.T. Still- Philosophy and Mechanical Principles of Osteopathy

Yoga & Osteopathic Principles

• Mind, Body, Spirit
• Structure and function
• The Still Point
• Autonomic Balancing
• Innate self healing
• Improvement of somatic dysfunction
Yoga Similarities to OMT

- MFR
- LVLA
- ME
- Articulatory
- Addresses factors contributing to:
  - Trigger points
  - Muscle imbalance
  - Autonomic balancing
  - Posture
Research Difficulties

- Style of Yoga
- Duration of class
- Variations in poses
- Inclusion of other limbs of yoga
- Short term vs long term practice
- Length of Intervention
- Practice at home vs class
- Outcome measured
- Scale used
- Quality of teacher
- Difficult to blind
- Self referral
- Attention/Group support
Research-Meta/Systemic Analysis

- **2007 Annals of Internal Medicine- (3)**
  - Fair evidence that viniyoga are effective for CLBP
    - **2013 Clin J Pain (10/8)**
      - Strong evidence short term effect on pain/long term effect on pain, Moderate evidence on long term effect on disability
    - **2011 Clin Rheumatol (7)**
      - “The evidence that yoga alleviates chronic LBP in the majority of studies is positive. Several caveats, prevent a firm conclusion”
    - **2016 J Orthop Rheumatol (14)**
      - “yoga can reduce pain and disability, can be practiced safely, and is well received by participants”
    - **2012 The Journal of Pain (19)**
      - “Yoga is a useful supplementary approach with moderate effect size on pain and associated disability”
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Yoga Protocol</th>
<th>Main Result</th>
</tr>
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<tbody>
<tr>
<td>Williams 2009</td>
<td>24 weeks- 2X weekly 90 min sessions- 30 min daily home practice- Iyengar</td>
<td>Improved functional disability, pain intensity, and depression</td>
</tr>
<tr>
<td>*Sherman 2005/2011</td>
<td>12 week- 75 min practice asked to practice daily at home Viniyoga</td>
<td>Yoga slightly superior to exercise, moderately superior to self care book</td>
</tr>
<tr>
<td>Galantino 2004</td>
<td>6 week twice weekly 60 minute Hatha yoga- encouraged to practice daily</td>
<td>No statistical difference yoga vs observation</td>
</tr>
<tr>
<td>Williams 2005</td>
<td>16 week- one 1.5 hr class- home practice 30 min 5 days a week Iyengar</td>
<td>Reduction in pain intensity, functional disability &amp; pain med use</td>
</tr>
<tr>
<td>Tilbrook 2011</td>
<td>Yoga vs usual care (book) 12 weeks- 75 min- home practice 30 min X2- Iyengar</td>
<td>Greater improvement in back function at 3,6,12 months- no change in pain</td>
</tr>
<tr>
<td>*Tekur 2008/2010</td>
<td>7 day residential yoga program</td>
<td>Improved pain related disability and flexibility &gt; exercise</td>
</tr>
</tbody>
</table>
Adverse Events

- **Surveys**
  - Finnish Ashtanga survey - 62% at least 1 yoga injury
  - Australian - 2500 79% never been injured - most were minor
  - US - less than 1% of yoga practitioners reported a yoga related adverse event
  - Germany survey - 303 patients - 4% reported adverse events

- **Cramer 2013** - 10 RCT - Not associated with serious adverse events
  - 3 studies with mild to moderate adverse events, 1 study with severe - n=1 herniated disc, n=1 severe pain

- **Chang Systematic Review 2016**
  - “10-15% incidence of temporarily increased LBP”

- **Cramer 2015 Systematic review of RCT - the safety of yoga**
  - 301 RCT (8,430 participants) 92 reported on adverse events
  - “yoga appears as safe as usual care and exercise”

- Better reporting of harms has been suggested as a need
“The Study of asana is not about mastering posture...
It is about using posture to understand and transform yourself”

~B.K.S. Iyengar
Awareness and Breath

- Attention to breath - abdominal breathing
  - Nasal breathing
  - Abdomen expands in inhale
  - 3 part breath
  - Lengthen exhalation

- Body Scan
  - Tense and relax each part of your body slowly, systematically, either from the top down or the bottom up

- Benefit
  - Relaxation, parasympathetic (relaxation) response
Cat/Cow with the Breath

- **Exhale**
  - Round Forward
  - Head drops
  - Push into upper thoracic spine
  - Coccyx rolls under

- **Inhale**
  - Arch back- extend
  - Shoulders down and back
  - Coccyx draws posterior

- Benefit - improved spine range of motion
**Seated Pawanmuktasana**

- **Inhale**
  - Draw the knee to the chest
  - Maintain a straight spine
  - Other foot remains planted on floor

- **Exhale**
  - Release the leg back down
  - Can also do this supine
  - Benefit: improved Hip Range of motion, hip flexion strength
Seated Leg Extension

❖ **Inhale**
   ❖ Extend the knee, flex the toes

❖ **Exhale**
   ❖ Bend the knee, point the toes
   ❖ Utilizing breath and awareness in movement
   ❖ Spine straight and long

❖ **Benefit**
   ❖ Strengthening of knee extenders, stretching of hamstrings
Bharadvajasana - (simple twist)

- **Inhale**
  - Both sits bones (IT) evenly grounded
  - Lengthen through the spine

- **Exhale**
  - Twist
  - Navel to spine

- **Benefit**
  - Improved spinal ROM, hip adduction
Seated Ardha Chandrasana

- May perform and hold on each side for several breaths
- Or move with the breath
- Push through the feet and isometrically pull the heels back
- **Inhale**
  - Sits bones (IT’s) firmly pushing into the chair
  - Stretch and reach
- **Exhale**
  - Release
- **Benefit**
  - Improved spine ROM, improved core strength, stretching of latissimus dorsi
Tadasana (Mountain Pose)

- Feel the four corners of the feet
- Engage the quads
- Slight posterior pelvic tilt
- Navel to spine
- Shoulders down and back
- Chin elevates a little, slight chin tuck

**Inhale**
- Arms rise overhead

**Exhale**
- Return to stand

**Benefits**
- Balance, strengthening of the lower extremities
Uttanasana (Forward fold)

- Hinging from the hips
- Maintain the spine straight
- Attempting lay the chest on the legs
- Bending the knees as needed to accommodate tight hamstrings
- Can stretch here-clasping opposite elbow
Ardha Uttanasana (half forward fold)

- Strengthen through legs
- Hands can rest on the chair, shins or blocks
- Spine long, tail bone lifts posteriorly
- **Flow**
  - Inhale stand
  - Exhale forward fold
  - Inhale half forward fold
  - Exhale forward fold
  - Inhale stand
- Benefit
  - Spinal ROM, hamstring flexibility, core strengthening
Standing Locust

- Stabilize the standing leg
- Contract the glutes to extend the hip
- **Inhale**
  - Lift the leg
- **Exhale**
  - Release
- Leading to sustained holding of the posture
- Benefit
  - Balance, hip extensor strengthening, spinal extension
Chair Pose (Utkatasana)

- Begin in standing (Tadasana)
- Sit back as you would be lowering yourself into a chair
- Keeping your knees together
- **Inhale**
  - stand and lift your arms up
- **Exhale**
  - Release stand back up
- To advance hold the form through several cycles of breath
- **Benefits**
  - Gluteus and lower extremity strengthening, core strengthening
Tree Pose (Vrksasana)

❖ Find strength and stability on the standing leg
❖ Other foot may toe touch, rest on the lower calf, or rest on the upper thigh
  ❖ Do not let it rest on the knee joint
❖ Find a place of focus with your eyes to assist with steadiness
❖ Hands can begin at your heart
❖ Or arms can elevate
❖ Benefit
  ❖ Balance, Lower extremity strengthen, lengthening of spine
Savasana

- Find your way to your mat, or a comfortable seat
- Optimally this would be a position you could totally relax in
- You may complete a body scan
- Focusing on the breath to clear the mind
- Benefit
  - Relaxation response
How to Recommend a Yoga Teacher

❖ Look for types of yoga including “hatha”, “anusara”, “beginner”
❖ Avoid “hot”, “bikram”, “ashtanga”, “power”, “vinyasa”
❖ Find teachers who also provide private sessions
❖ RYT 200, ERYT-200, RYT-500, ERYT 500
   ❖ Number denotes hours of training- e denotes number of hours teaching
   ❖ Yoga Alliance (www.yogaalliance.org)
❖ Yoga Therapy
   ❖ International Alliance of Yoga Therapists (IAYT)
   ❖ http://www.iayt.org/
Questions Your Patient Can Ask

❖ How **strenuous** will the workout be?
❖ How **many** poses are done in what period of time?
❖ The level of **difficulty** of the poses?
❖ How and where the teacher was trained?
❖ What **kind** of yoga the teacher does?
❖ Whether there is **attention to physical problems** like back pain?
❖ Whether **meditation** is included in the lesson?
   ❖ From “*Cure Back Pain with Yoga*”
❖ Do the teachers **modify** postures?
❖ Does the patient connect or **identify with other people in the class**?
❖ What **populations** of people has the teacher worked with before?
Practice Advice

- Patients may begin with 1-2 poses per day- holding for 15-20 seconds
- Shorter holds before longer holds
- Moderation
- Slow medicine
- Start simple
- Listen to pain- good pain- vs injury

**INJURIES DO HAPPEN**

- Flexible people at greater risk of injury
- Neck injuries most serious
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- Hiroe Hu OMS II
- Cara Vernacchia OMS II

Questions?
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