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Recommendations for preventing and managing mechanical low back pain with occupational therapy clients

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Learner Outcomes

- Identify factors that contribute to the onset of pain at the lumbar region

- Administer evidence-based assessment tools to measure the impact of low back pain on occupational performance

- Implement 2-3 evidence-based intervention strategies or patient education recommendations with patients who present with low back pain and occupational dysfunction
Course Structure

- Introduction
  - Anatomy and Conditions
- Evaluation
  - Screening and Assessment
- Intervention
  - Prevention
  - Management of occupational dysfunction
- Q&A

- Introduction—Anatomy and Conditions
Mechanical low back pain: pathology of the lumbar articular facet joints, lumbar discs, lumbar vertebrae, or the soft tissue structures (muscle/ligaments) acting on the lumbar spine

- Affects 75-80% of the population; women and men affected equally
- Common risk factors: work demands, posture, lifestyle, age, genetics, pregnancy

Complexity of the Spine

- Photo: By OpenStax CC BY 4.0 (http://creativecommons.org/licenses/by/4.0), via Wikimedia Commons
Lumbar Region:

- 5 lumbar vertebrae
  - Largest moveable vertebrae, supporting the weight of the upper body
  - Lumbar spine serves as a source of mobility as well as stability
    - Why does this matter?

Lumbar vertebra

- Body: Stable structure supporting the intervertebral disc
- Foramen: Allows for passage of spinal cord
- Intervertebral foramen (not shown): Allows for passage of spinal nerve roots
- Transverse and spinous processes: Serves as lever for muscles and ligaments surrounding the lumbar spine
- Pedicles and laminae: Stable connections between bony structures of the vertebra

Photo: By Anatomist90 (Own work) [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons
Range of Motion

- Cervical movements
  - Flexion: 50 degrees
  - Extension: 70 degrees
  - Lateral flexion: 45 degrees
  - Rotation: 90 degrees

- Thoracic movements
  - Flexion: 35 degrees
  - Extension: 25 degrees
  - Rotation: 30 degrees

- Lumbar movements
  - Flexion: 30 to 50 degrees
  - Extension: 15 to 25 degrees
  - Lateral flexion: 25 degrees
  - Rotation: 5 degrees

Conditions of the lumbar spine

- Mechanical low back pain
  - Lumbago
  - Lumbar pain
  - Lumbar strain/sprain
  - Lumbar syndrome

- Radiculopathy
  - Caused by tension on the nerve root
  - Lateral compression
  - General symptoms: Pain, numbness, and/or weakness that radiates to other parts of the body

- Myelopathy
  - Impacts the spinal cord
  - Number one cause of spinal cord dysfunction in the elderly
  - Motor deficits appear before sensory changes
Evaluation—Screens and Assessment
Where to start…

There is no “go-to” assessment for thoracic-related conditions
INSTEAD:
1. Postural assessment
2. Workplace assessment
3. Self-report of symptoms during occupation-based tasks
4. Pain scales
5. Thorough review of medical history

To assess posture:

- Multiple angles!
  - Standing
  - Sitting (supported)
  - Sitting (unsupported)
  - Lifting/stooping
  - Sleeping

- ROM of the trunk and low back may aid in determining problem areas
  - Flexion
  - Extension
  - Rotation – Compare side to side
    - Limitations in any of these areas?

- Use a postural grid (or posture analyzing app) in order to detect postural asymmetries
Quick trunk ROM screen

- Thoracic movements
  - Flexion: 35 degrees
  - Extension: 25 degrees
  - Rotation: 30 degrees

- Lumbar movements
  - Flexion: 30 to 50 degrees
  - Extension: 15 to 25 degrees
  - Lateral flexion: 25 degrees
  - Rotation: 5 degrees

Postural assessment—Plumb Line

- Mark the following landmarks on your patient (as able) to detect asymmetries
  - R/L (right/left) anterior, lateral, and posterior acromion
  - Sternal notch
  - R/L ASIS
  - R/L PSIS
  - R/L acetabulofemoral joint (hip joint)
  - R/L lateral epicondyle of femur
  - Spinous process of C7, T3, T8, T12, and L3
  - R/L ear lobe
  - R/L lateral malleolus
  - Posterior surface of the calcaneus (ankle)
Workplace assessment

- Key observations:
  - Physical demands
  - Typical lifting or carrying activities
  - Frequency/intensity of activity
  - Workstation setup
  - Footwear/clothing

Sitting and sleeping posture
Additional assessments

- Canadian Occupational Performance Measure
- Oswestry Low Back Pain Disability Questionnaire
  
  http://www.rehab.msu.edu/_files/_docs/oswestry_low_back_disability.pdf

- Pain Scales
  - Numeric Pain Scale (1-10)
  - Visual Analog Scale (--------------------)
  - Wong-Baker Faces Scale 😊😊😊

- Health history
  - Previous injuries
  - Genetic conditions
  - Risk factors (e.g. osteoporosis)

- Intervention—Prevention and Management of Occupational Dysfunction
Summary of the evidence (AOTA)

- Moderate to strong evidence supports of a variety of back school and education approaches:
  - Web-based daily reminders for exercises* and posture
  - Information and advice on pain management strategies and work-style strategies
  - Energy conservation and joint protection techniques.
- Overall, there is mixed evidence for ergonomic interventions
- Limited evidence for the use of lumbar belts/braces

Postural Interventions

- Lumbar roll encourages normal lumbar curve while seated
  - Foam noodle
  - Towel roll
  - Commercial lumbar rolls
- Encourage the 90-90-90 position
- Arm rests to support trunk and minimize rounded shoulder position
Postural Interventions--Continued

- Web-based reminders or App downloads
  - Encourages positional changes and neutral postural alignment
- Photo log
  - Track postural progress through photographs
- Task-specific postural tasks
  - Simulate reaching, lifting, and bending tasks required during work-related tasks and ADLs/IADLs
- Therapeutic exercise program
  - Document appropriately!
  - Connect role of exercise to occupational performance

Additional considerations

- Avoid forward flexion while holding objects in front of the body!
- Disc pressures during the following activities:
  - Sitting while slouched forward – 175%
  - Standing upright w/ 9lb object – 200%
  - Standing while bending forward – 200%
  - Standing while squatting w/ 9lb object – 325%
  - Standing while bending forward w/ 9lb object – 450%

(Wilke et al., 1999)
Therapeutic exercise

- Stretch muscles that are prone to shortening:
  - Pectoralis major/minor*
  - Upper trapezius
  - Rectus femoris
  - Iliopsoas

- Strengthen muscles that weakened:
  - Rhomboids*
  - Abdominals
  - Gluteal region
  - Lower and middle trapezius*

- Consider collaborating with physical therapy to ensure correct muscle groups are being targeted and how
Rhomboids and Middle Trap strengthening

Lower trapezius strengthening
Lower trapezius—option 2

Therapeutic exercise program recommendations:

- Complete stretches and strengthening exercises 5x/week
  - Week 1-2: Isometric exercises
  - Week 3-4: Concentric strengthening
  - Week 5-6: Eccentric strengthening (Jaromi et al., 2012)

- Document appropriately for OT!
Thank you!
Questions?
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References


