HENRY FORD HEALTH®

From Discomfort to Empowerment: Nurturing Spinal Wellness and Self-Efficacy

Michigan Osteopathic Association

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Linda Holland DC – Speaker
I have no relevant financial relationships to disclose

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Biography

- Board Certified Doctor of Chiropractic
- Graduate: Life University, Georgia 1990
- Davenport University. MBA Expected in 3/2025
- HFH Center of Integrative Medicine 5 years
- Private practice owner 20 years

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Objectives

- The Global crisis of low back pain
  - Need to reduce chronicity
- Treatment based strategies
- Patient-Centered Care
- Integrated care model
- Case studies

Goals

- Review of research and clinical guidelines related to low back pain management
- Embracing a biopsychosocial approach
- Highlighting the importance of customizing treatment plans to align with individual needs and preferences

The Prevalence of Low Back Pain

80% of people in the U.S. will experience low back pain in their lifetime (Hoy et al, 2014).

The top two causes of Years lived with disability are presently:

- **Low back pain (LBP) leads** (Hartvigsen et al., 2018). (Wu et al., 2020)
- Mental Health: Anxiety and Depression (U.S. department of Health and Human Services 2016)

In 2020, (LBP) affected 619 million people globally estimated to increase to 843 million by 2050 (Centers for Disease Control and Prevention, 2020)

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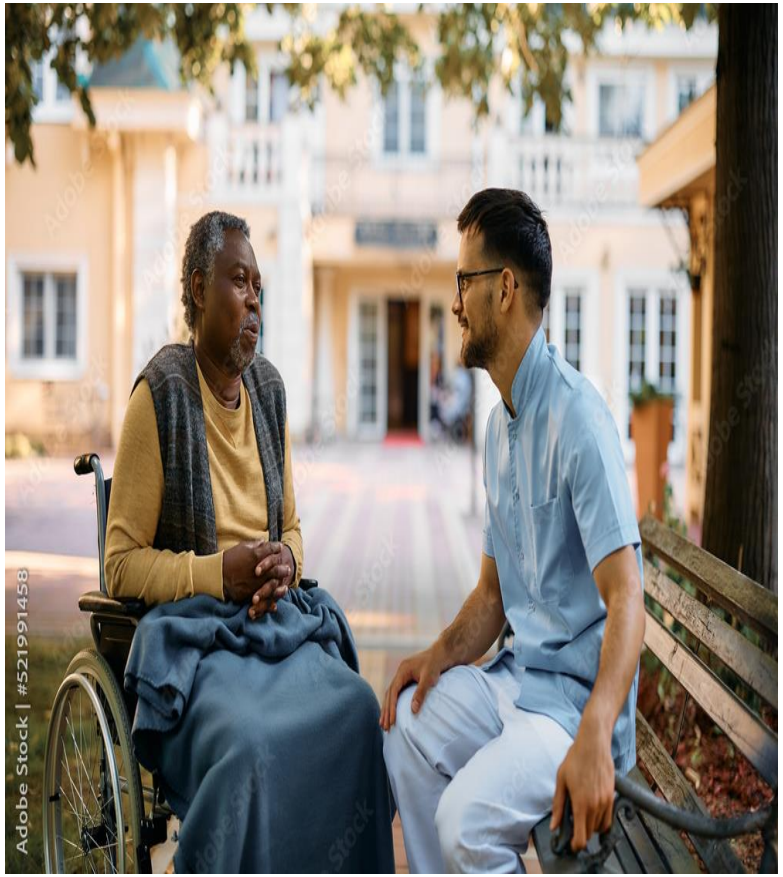
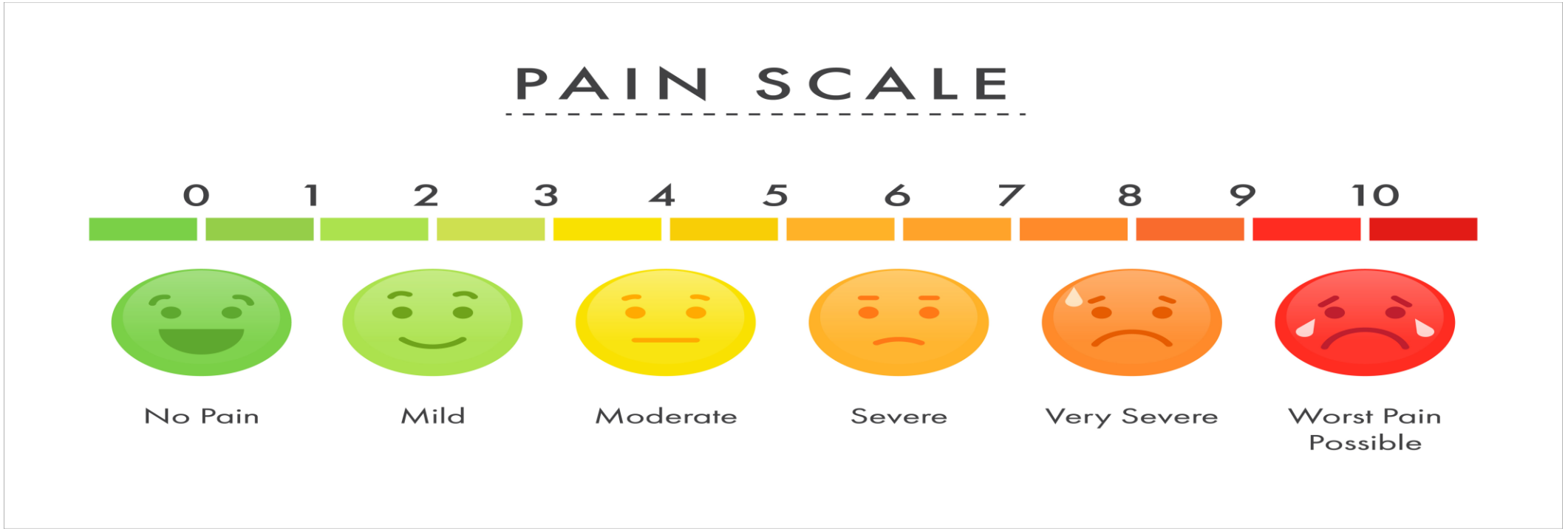
LBP

- 37.3% of those aged 75 and older
- 24.5% in ages 18-44
- Females have a greater rate at 31.6% compared to males at 28% (Julia, *2023).*

- Baby boom could fuel 50% increase in age 65 + requiring **nursing home care,** from 1.2 million in 2017 to about 1.9 million in 2030 (Mather, et al., 2019).





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LBP

Specific LBP is pain that is caused by a certain disease or structural problem in the spine, or when the pain radiates from another part of the body.

5% is nerve root pain/ prolapsed disc is 90% of this cause (Julia, 2023).

Non-specific LBP is when it isn't possible to identify a specific disease or structural reason to explain the pain. It is non-specific in about **90%** of cases. (Chiarotto & Koes, 2022).

Risk factors for non-specific LBP include:

- Increases with age, peaking around 80-90 years (Wu et al., 2020).
- Educational attainment
- Job dissatisfaction
- Psychologic factors
- High physical stress at work or low physical activity levels
- Smoking, and obesity
- Many causes can include Musculoskeletal conditions ie. Arthritis, psychological such as anxiety and depression (Chiarotto & Koes, 2022).

US Spends more of gross domestic product than other high-income countries on healthcare. Ranks poorly on many
health indexes (Kuehn, 2021).

Costs for services, products & insurance policies have inflation (Shi & Singh, 2022).

ER: The Safety Net for Healthcare: Prevention measures in place to reduce return visits
Reduce access barriers (IHI Open School, 2014).

Scientific Research: Identify services that help with best health outcomes.
Promote Provider collaboration

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Access to Care

- Key determinant of health is the ability to utilize medical care appropriately
- Benchmark for health care efficiency
- Sustainability, continuum of care
- Personal knowledge & demographics

(Shi & Singh, 2022-a)

Quality of Care

- Quality is measured against a standard (van Leersum et al., 2019)
- Structure and Process Influence Quality Outcomes
- 3 Key Elements for Improvement: Right diagnosis, right care, right place (Shi & Singh, 2022-a)

$$V = \frac{Q + S}{\$\ cost}$$

Value = Quality + Service / $ cost

(University of Utah Health. n.d.)

- Collaborative Quality Initiatives
- Ethical Practices
- Future of Healthcare/ Best Practices

Healthcare Coordination:

Cost Effectiveness, Better Outcomes

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Costs

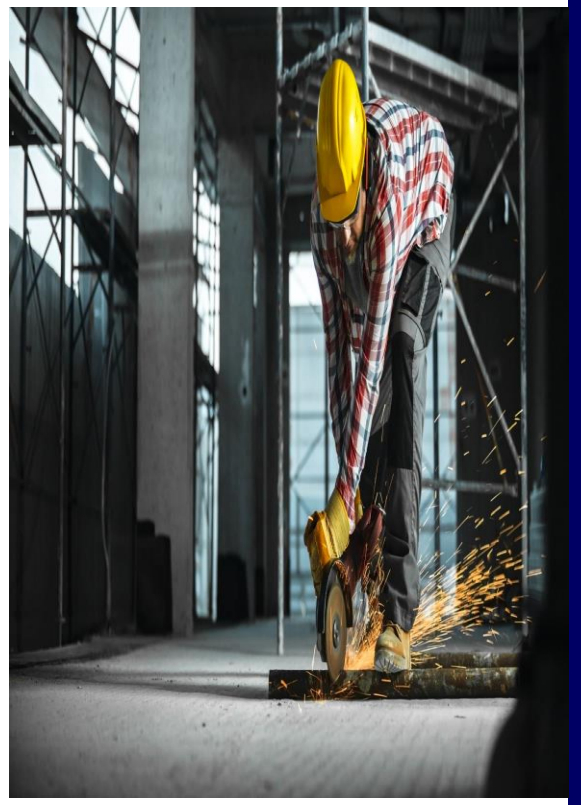
- Data indicates that treating LBP accounts for over $100 billion in care yearly total expenses involved
- 69% (7 in 10 adults) have a reoccurrence of back pain within a year after recovery (Julia, 2023).

- Savings were shown with starting physical therapy within three days of receiving an acute LBP: less likely to use advanced imaging, specialist care and opioids (Guin, 2018).

Up to 92% of back injuries result from stressful postures, daily life or workplace injuries (Smith, 2023). Cost employers **$10 million** annually in losses (Julia, 2023).

Occupations most affected by back pain related injuries in US 2016

#1 Nursing assistants at 52.8% lift & move patients
#2 Stock clerks and order fillers at 45.7%
#3 Laborers and freight, stocks and material movers at 43.0%
#4 Maintenance and repair workers at 42.5%
#5 Janitors and cleaners 37.5%
#6 Truck drivers 32.4% (Workcomwire, 2018).



Unburdening Health Care Providers and Empowering Patients: for Enhanced Self-Efficacy

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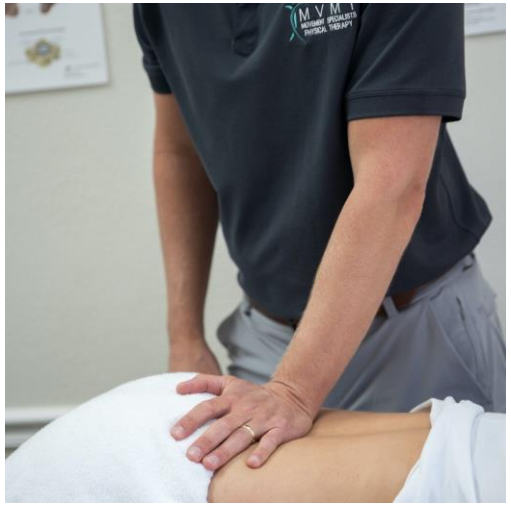
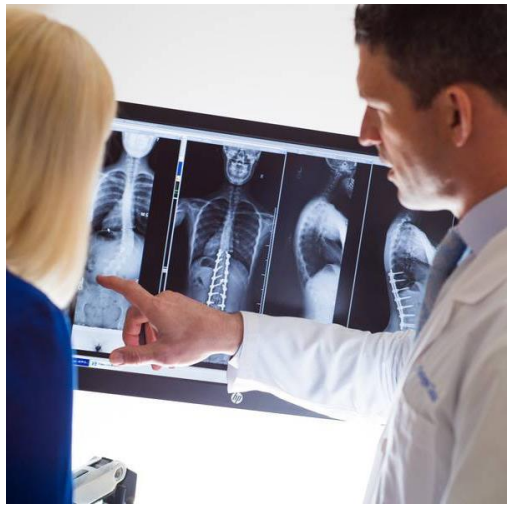
Treating Musculoskeletal Disorders



DO/Physical Therapist/DC

APP/ NP Primary Care Physician/ UC ER



Orthopedic Surgeon/ PM & R

Neurosurgeon

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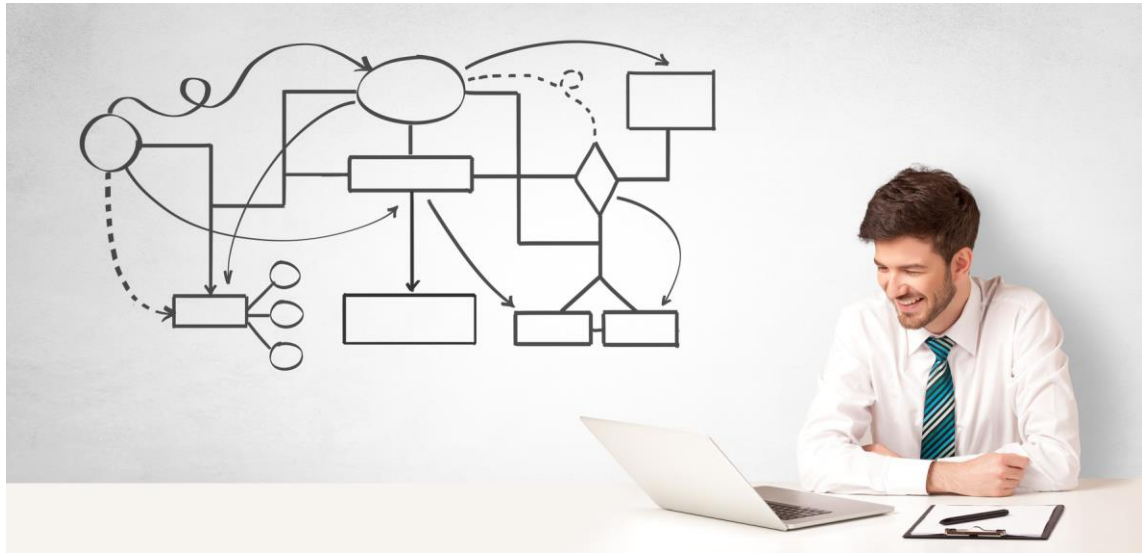
Practice Patterns

- Culture of company: Style of practice
- Expectations
- Clinician autonomy
- Patient pressure management

Knowledge and Access to Resources

- Varied academic backgrounds
- Access to updated research
- Data: Patient reported outcomes
- Training: Updated, and ongoing
- Collaboration on best practices

Treatment Algorithms



Treatment Plans

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Triage of the Patient by: Risk factors of: High, Moderate, Low

Patient reported outcomes (PROs), consultation, history and clinical examination (location, timing, character, severity)

Comorbidities, progressive neurologic deficits

Psychosocial risks

Symptomology and pain level state: volatile, stable or controlled

(Physiopedia, n.d.)


PREVE
SLEEP HYGIENE
SPINE
KINESIOTAPING/TAPING TECHNIQUES
INFRARED LIGHT THERAPY (ILT)
ERGONOMICS
TRIGGER POINT THERAPY (TPT)
STRENGTH TRAINING
DYNAMIC NEUROMUSCULAR STABILIZATION EXERCISES
FUNCTIONAL CAPACITY EVALUATION (FCE)
MANUAL THERAPY TECHNIQUES (MTT)
CORE STRENGTHENING
OCCUPATIONAL THERAPY (OT)
NEUROMUSCULAR RE-EDUCATION EXERCISES
PSYCHOLOGICAL COUNSELING/THERAPY (PCT)
NEUROMUSCULAR RE-EDUCATION (NMR)
COGNITIVE BEHAVIORAL THERAPY (CBT)
POSTURAL RESTORATION EXERCISES
GAIT TRAINING/RE-EDUCATION (GTR)
FUNCTIONAL MOVEMENT SCREENING (FMS)SURGERY/PROCEDURES
MANAGEMENT
YOGA
MYOFASCIAL RELEASE (MFR)
MANUAL SPINAL MOBILIZATION TECHNIQUES
BALANCE TRAINING/RE-EDUCATION (BTR)
JOINT MOBILIZATION (JM)
INTERFERENTIAL CURRENT THERAPY (ICT)
BIOFEEDBACK TRAINING (BFT)
MUSCULOSKELETAL
POSTURE
STRESS
AEROBIC EXERCISE
LOW LEVEL LASER THERAPY (LLLT)
MAGNETIC FIELD THERAPY (MFT)
DYNAMIC LUMBAR STABILIZATION EXERCISES
COLD THERAPY
STRATEGIES
EXERCISE
SOFT TISSUE MOBILIZATION (STM)
VIBRATION THERAPY (VT)
PERCUTANEOUS ELECTRICAL NERVE STIMULATION (PENS)
ACUPUNCTURE
HEAT THERAPY
NUTRITION
POSTURAL EDUCATION/RE-EDUCATION (PER)
MASSAGE THERAPY
PHYSICAL THERAPY
ELECTRICAL STIMULATION THERAPY (EST)
SPINAL TRACTION
BACK PAIN
ULTRASONIC THERAPY (ULT)
INJECTIONS/MEDICATIONS
AQUATIC EXERCISE/THERAPY (AET)
CHIROPRACTIC CARE
TAI CHI/QIGONG EXERCISE (TCQE)
BIOMECHANICAL ANALYSIS (BA)
DISORDERS
MANUAL SPINAL MANIPULATION TECHNIQUES
RELAXATION TECHNIQUES/THERAPY (RTT)
SPINAL DECOMPRESSION THERAPY
LIFESTYLE CHANGES
ULTRASOUND THERAPY (UST)
ERGONOMIC ASSESSMENT (EA)
FLEXIBILITY TRAINING
EXTRACORPOREAL SHOCK WAVE THERAPY
LASER THERAPY (LT)
MEDITATION
WEIGHT LOSS
DYNAMIC NEUROMUSCULAR STABILIZATION TECHNIQUES
NEURODYNAMIC TECHNIQUES (NDT)
MANAGEMENT
SPINAL MANIPULATION THERAPY (SMT)

Customize plans to align with the individual needs and preferences of the patient.

Routine x-ray imaging is not recommended for non-specific Low back pain in the acute phase (Globe et al., 2016).

Non-drug and Non-invasive therapies help people avoid potential side effects that can ranges from injury, addiction and or death. (Dowell et al., 2022)

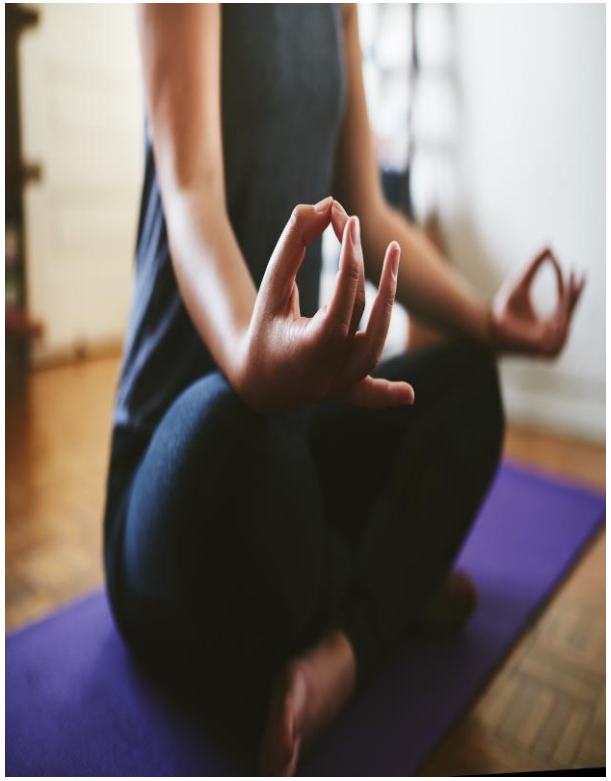
Alternatives to Integrate in the Care Model

- Behavior Health, Clinical Health Psychiatrist
- Physical therapy
- Acupuncture
- Massage therapy

(CDC, 2021)

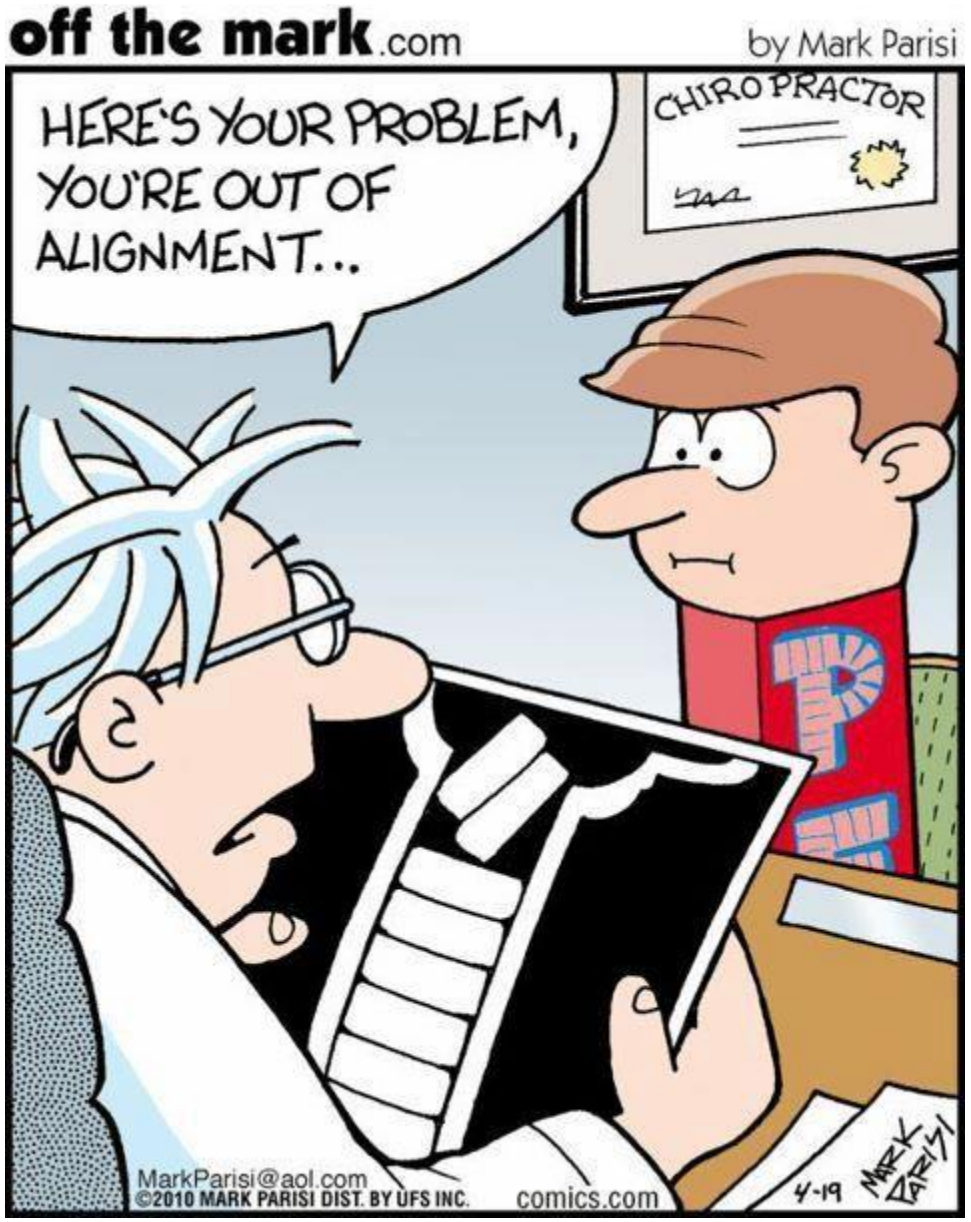
- Spinal Decompression
- Flexion-Distraction traction/long axis traction
- Low level laser
- Exercise programs improve physical function:
- Mobilization devices: wobble cushion,
- Foam roller, stability ball
- Topical: heat, Ice, ointments (may be herbal)
- Transcutaneous electrical nerve stimulation

(CDC, 2021)



Medical interventions:
Medication
Guided injections,
Prolotherapy/Trigger point injections
Ablations: lumbar medial branch and or sacral lateral branch radiofrequency ablation,
Epidurals
Surgery, etc.

(CDC, 2021)



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The Importance of Self-Efficacy in Chronic Illness Management

Definition: An individual's belief in their capacity to execute behaviors necessary to produce specific performance outcomes. It's the confidence in one's ability to influence events and control over one's environment –*Albert Bandura* (Lopez-Garrido, 2023)

Estimate of 20 to 25% of adults with LBP experience depression and or symptoms potentially seek more health care utilization and risk a poorer recovery (Wong et al., 2019).

Incorporate a cognitive behavioral approach taking into account a person's specific needs and capabilities.

- Provide reassurance, advice to keep active and guidance on self-management.
- Provide resources and referrals to Behavioral Health or a psychologist when indicated (Katzan et al., 2018).

STarT Back Screening Tool: Assess patients and places them into 3 categories for Risk. **Low, Medium and High Risk**.
This stratified care approach involves customizing treatments for Patients by considering their prognosis or likelihood of experiencing unfavorable clinical outcomes (Keele University, n.d.).

Motivational interviewing **requires four key communication skills that support and strengthen the process of eliciting change talk, also known as:**

OARS

- **O**pen-ended questions
- **A**ffirming
- **R**eflective listening
- **S**ummarizing (Souders, 2023).

4 processes to build the patient-centered approach for collaborative change

Engaging: Build a rapport, establish trust & create a safe space for the patient to
share their feelings and opinions

Focusing: Identify the patient's goals and priorities for change

Evoking: Help the patient to identify their own reasons for change, Allow them to explore their ambivalence, values, and goals

Planning: Tailored plan with specific steps they can take so they feel comfortable (Souders, 2023).




Movement for a Better Quality of Life




"Our greatest weakness lies in giving up.
The most certain way to succeed is always to try just one more time." - Thomas Edison

Endurance Tests

Plank Test

- **Objective**: To assess core endurance and stability.
- **Procedure**:
  - Begin in a forearm plank position with elbows under shoulders and feet hip-width apart.
  - Maintain a straight line from head to heels without sagging or hiking the hips.
  - Hold this position for as long as possible.
- **Scoring**: The time held in the correct position is the score

(Chase & Brigham, 2014)

Plank Standards on average

Research conduction on university students

- **Males** maintained a plank hold for 124 +- 72 sec.
- **Females** averaged 83 sec +- 63 sec.

Notably, athletes did demonstrate 48% longer plank durations (Strand et al, 2014).

18-25 year olds: Linfield University suggest that 50th percentile values were

- **Females** 1.50 minutes
- **Males** 1.77 minutes (Chase & Brigham, 2014).

McGill's Torso Muscular Endurance Test Battery Core endurance Scores are based on how long each position is held/normative values. Asymmetry may suggest weaknesses or instability that could impact spinal stability.

Procedure:

- **Trunk flexor endurance: 60* angle** static trunk flexion posture.
- **Trunk lateral endurance:** static side-bridge posture.
- **Trunk extensor endurance**: static prone extension posture. (Mat, 2023).

Side bridge: Male athlete holding times were longer than the female athletes.

Levels of body mass index, motivation and self-efficacy impact Endurance (Mat, 2023).

McGill's Torso Muscular Endurance Normative Results:

Flexion: 224 seconds
Extension: 163 seconds
Right Side Plank: 104 seconds
Left Side Plank: 103 seconds.
Flexion/Extension Ratio: <1.0
Side Plank Ratio: 1:1
Side Plank/Extension Ratio: <0.75 (Evans et al., 2007)

History of the “Sit-to-Rise” test

Study was conducted by Dr. Claudio Gil Araújo and his colleagues in Brazil was published in the "European Journal of Preventive Cardiology" in 2012. The researchers were looking for an easy method to spot people with muscle and joint impairments.

The SRT, gauges an individual’s muscular strength, balance, and flexibility. Associated with life expectancy and can provide Insight into a Person’s mobility and overall well-being (Arujo et al., 2020).

1. Starting Position: Begin by standing barefoot on a flat surface.
2. Descending Phase: Without using your hands, knees, or arms for support, lower yourself to a seated position on the floor.
3. Ascending Phase: without using your hands, knees, or arms for support, rise back to a standing position. (Arujo et al., 2020)

The scoring for this test is on a scale of 0-10.
Higher score reflects better physical performance.
Half points are deducted whenever you use a body part (like your hand, knee, or forearm, etc.) for support

People who scored below 8 points on the test had a considerably higher risk of mortality.

- **Scores 8-10**: **Higher** level of physical fitness/ potentially longer lifespan.
- **Scores 3-7.5**: **Moderate** level of physical fitness higher mortality risk.
- **Scores 0-3**: Demonstrates a **substantial risk** of earlier mortality

(Araujo et al., 2020)

Criticisms and Considerations

1. **Simplicity:**
2. **Suitability:** The test is not suitable for individuals with specific health conditions or older individuals with reduced mobility.
3. **Single Metric:** Cannot account for all the factors influencing Lifespan. Examples are nutrition, mental health and genetic factors.

Conclusion: Should serve as a tool to encourage healthier lifestyles (Araujo et al., 2020).

Successful 10-second one-legged stance performance predicts survival in middle-aged and older individuals.

Barefoot participants placed the dorsal region of the non-support leg on the back of the support leg. They were allowed three attempts, and based on their performance, were classified as "YES" (able to complete) or "NO" (unable to complete) the test successfully (Araujo et al., 2022).

Results

- 20.4% of participants failed were classified as "NO."
- Inability to complete increased with age, doubling every five years from ages 51 to 70.

Seven-year follow-up:

- 7.2% of participants died, with causes including:
  17.5% were in the "NO" group
  4.6% were in "YES" group (Araujo et al., 2022).

Goal is to improve balance early.

Functional Movement Screen (FMS™) and other screening functional movement assessment (SFMA) systems

Majority test both sides of the body for symmetry.

Typically looks at: **Shoulder Mobility, the Active Straight Leg Raise, the Trunk Stability Push-up, and Rotary Stability** using a scoring system.

SFMA scoring

1= unable to complete

2= compensates

3= correctly complies with standard expectations

(Cook et al., 2014)

** With the Push-up and Rotatory Stability test, if pain is present the score is 0

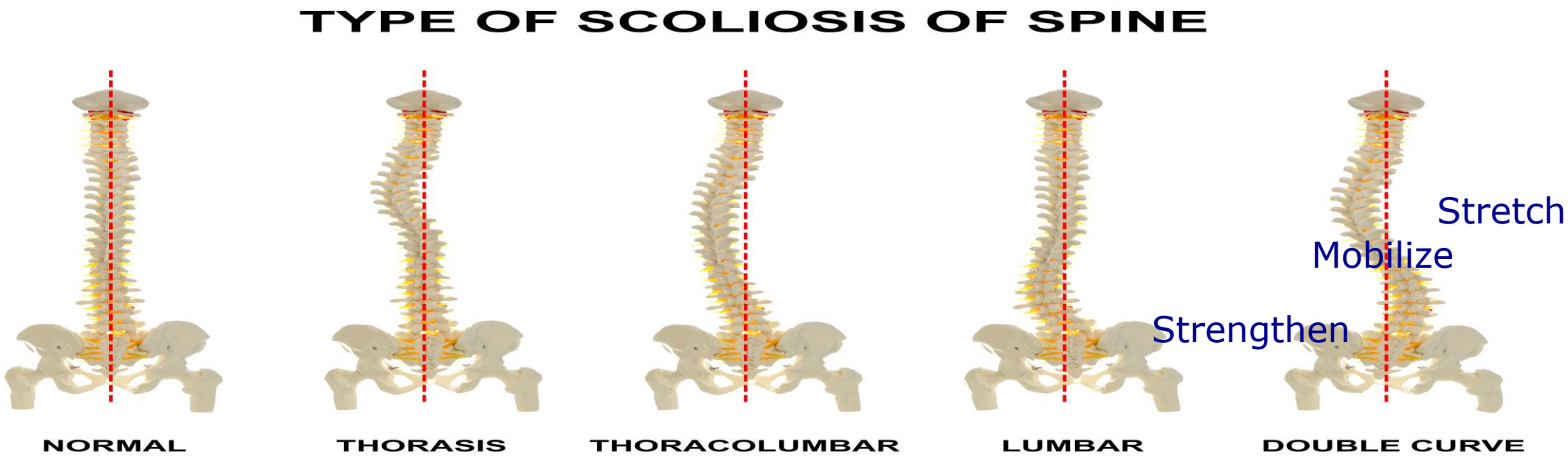
Helpful in identifying deficient areas of mobility or stability in the asymptomatic population and useful for rehabilitation of the injured.
Identifies regions to investigate for potential factors contributing to lower score (Cook et al., 2014).

Corrective Exercise-Based Therapy: Adolescent Idiopathic Scoliosis

In adolescents with **mild to moderate** idiopathic scoliosis, corrective exercise-based therapy can serve as a standalone treatment or as a complementary approach when combined with other therapeutic resources. Enhance quality of life.

(Gámiz-Bermúdez et al., 2021)

Balance, skating, tai chi, martial arts, swimming, stability ball exercises



Congenital- vertebral abnormality causing mechanical deviation
Neuromuscular- Cerebral Palsy, paralysis, Duchenne Muscular Dystrophy

Syndrome-related Marfan syndrome, neurofibromatosis
Idiopathic- without an obvious cause * most common
Spinal curve related to secondary reasons

Caution:Syringomyelia ,tethered cord or tumour
Other concerns: Ehlers-Danlos syndrome (joint hyper-elasticity), High foot arch in Charcot-Marie-Tooth disease and
Hairy patch or dimpling over spine as with Myelomeningocele.

(Janicki & Alman, 2007)

Must be evaluated for cardiac and renal abnormalities

Treatment: Idiopathic scoliosis is based on Patient age, degree of curvature and risk of Progression. Includes observation, Orthotic management or surgical correction

REFERRALS:

- > 10 degrees in < 10 years old.
- >20 degrees in =/>10 years, associated with back pain or neurological abnormalities.
- > 45 degrees Surgical intervention

(Janicki & Alman, 2007)

Chiropractic Manipulation for Degenerative Scoliosis:

Objective: To assess the clinical effectiveness of chiropractic manipulation in treating Degenerative Scoliosis (DS).

Methods: Between June 2017 & Sept. 2019, 120 DS patients
Group A : (n=60) Chiropractic SMT every other day /4 weeks
Control group B: (n=60) treated with eperisone hydrochloride tablets And a Thoracolumbar Orthopedic (TSLO) brace.
Visual analogue scale, Oswestry disability Index: recorded before treatment, and at 1,2,3, 4 weeks and 1 month post treatment.
Full-length spine x-rays were taken before & 4 weeks after measured Cobb angle, sagittal vertical axis (SVA) & lumbar Lordosis (LL).

(Li et al., 2020)

Results: Significant differences in VAS and ODI were observed. Treatment group showed superior results Cobb angle was significantly better.
P=0.010 for treatment and P= 0.017 for control
4 adverse reactions were found only in the control group.

Conclusion: Chiropractic SMT effectively alleviates pain and enhances lumbar Function in DS patients, ensuring better safety and the potential for improving Cobb angle in DS patients.

(Li et al., 2020)

To maintain good balance, stability and spring-like qualities, the Intrinsic muscles (flexors) should to be strong for proper control of the foot (supination and pronation).
Orthotics: for biomechanical alteration. Heal lifts may be added for leg length discrepancy . (physiopedia, n.d.)

The Framingham Foot Study:

Planus structure of the foot is associated with higher odds of knee or pain.

Women show increase in pronation and lower back Pain.

Those with a cavus (high arch) foot structure: higher incidence of ankle pain and 1 lower extremity site that hurts (Riskowski, J.L., et al., 2018).

Exercises/Stretches: Patient should be triaged to determine appropriate management

Foot: “Toe curls” use to gather a towel on the floor, pick up matches, Marbles or pencils. Toe presses and stretching.

A Czech Neurologist Vladimir Janda’s “short foot exercise” to strengthen the intrinsic foot muscles (Lee & Choi, 2019).

Core:

Bird dog, Clam Bridges, pelvic tilts
Planks (beginner- elbows and knees/ or regular hands and toes)
Push-ups (beginner is wall push ups)
Squats (use chair behind or bed in case extra support is needed
Knee to chest (William's exercises) single, double
Hip flexors: lunges
Hamstrings, calves

(MIBAC, 2023)

Exercises/Stretches cont.: Centralize the pain

Standing wall side glide

Nerve flossing:

Lower extremity: Seated, standing

(Murphy, 2013) Pintrest 10/15/23

Lumbar extensions (position of preference) McKenzie
10 reps. 3x/day for Sciatica

Abdominal tone: lift from shoulder blades up

(Murphy,2013)

Table 2:

Age-specific prevalence estimates of degenerative spine imaging findings in asymptomatic patients[a]

Imaging Finding	Age (yr) 20	30	40	50	60	70	80
Disk degeneration	37%	52%	68%	80%	88%	93%	96%
Disk signal loss	17%	33%	54%	73%	86%	94%	97%
Disk height loss	24%	34%	45%	56%	67%	76%	84%
Disk bulge	30%	40%	50%	60%	69%	77%	84%
Disk protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

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(Brinjikji et al., 2015)

Acute and chronic patients with lumbar disc Herniation treated with chiropractic SMT reported clinically relevant improvement.

In the study, 148 patients 18-65 with LBP and leg pain on exam with MRI confirmed disc herniation received High-velocity, Low-amplitude (HVLA) smt.
Oswestry and NRS were recorded up to 1 year.
No adverse effects were recorded
Acute: improved faster by 3 months. 90.5%
“improved” and then at 1 years 88.0% improved.
Chronic: 81.8% improved at 3 mo. 89.2% at 1 yr.

(Leemann et al., 2016)

Traction in Lumbar Disc Herniations:

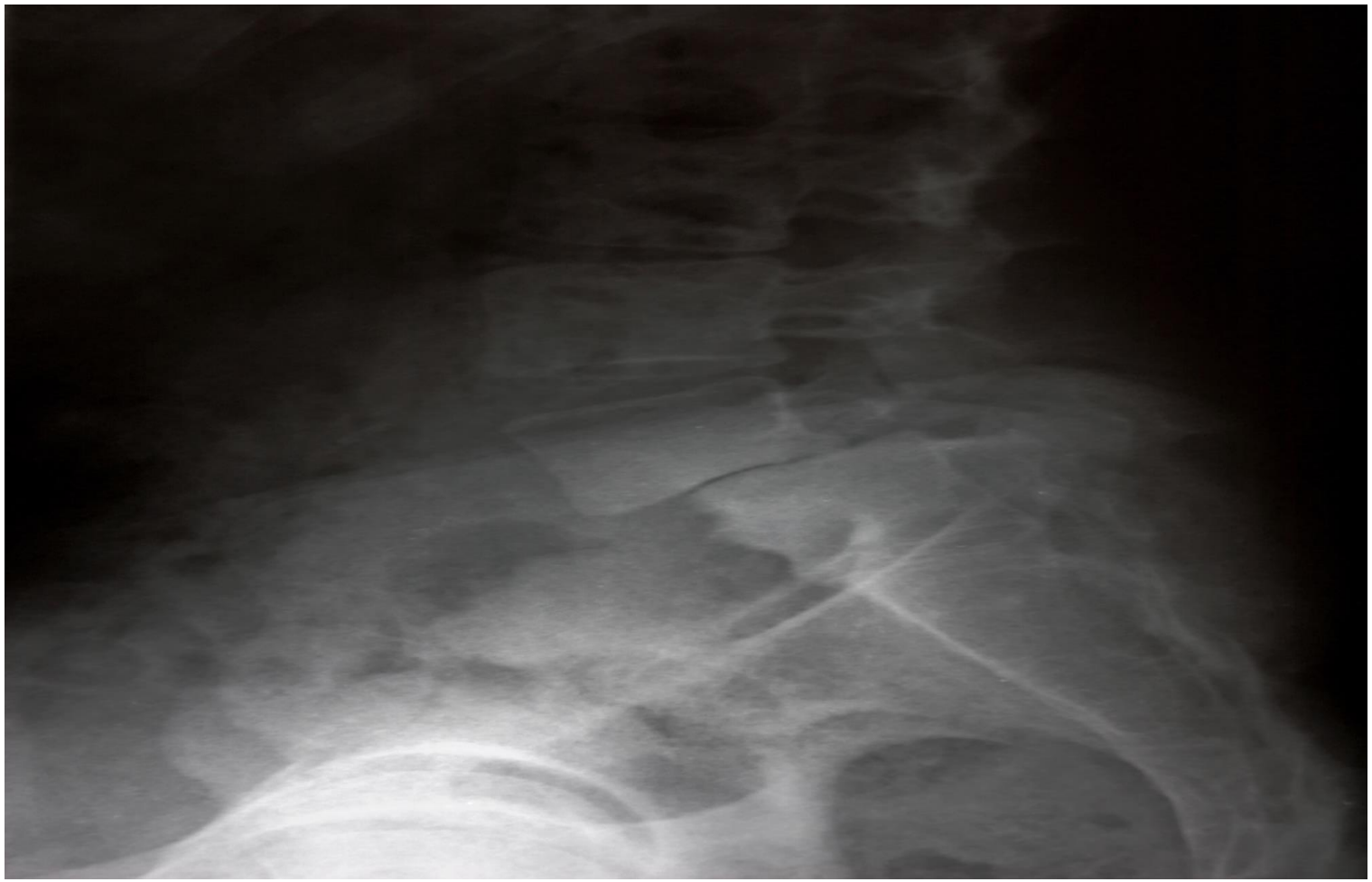
"Evaluate the results of lumbar traction treatment at different traction angles and different traction forces using the finite element analysis Computed tomography (CT) images of a healthy 35-year-old male no history of trauma or fracture were modeled **in three-dimensional with Mimics® software** for the lumbosacral spine model.

All analyses performed at different angles and forces from the center of the sacral surface to simulate traction therapy." (Oten et. al, 2022)

Findings: When applied traction forces in the 0* axial direction, lowered intradiscal pressure.

Conclusion: Traction benefits by adjusting the force and direction based on MRI or CT scans (Oten et. al, 2022).

Spondylolisthesis



Types:

1. Isthmic. Consequence of spondylolysis, congenital or traumatic break In the pars interarticularis. Most common type in adolescents with LBP. Higher among athletes who perform repeated spinal flexion & extension

2. Degenerative. Caused by degenerative arthritis or disorders of disc

- Creates lumbar stenosis and nerve impingement may occur.
- Complains of LBP, worse with activity, relieved with rest.
- Depression is seen at site, exaggerated lumbar lordosis. (chan et al., 2019)

Spondylolisthesis

Degenerative lumbar spondylolisthesis is a prevalent source of LBP, Impacting 11.5% of the U.S. population.

Initial management is typically:

- Conservative such as physical therapy and SMT, when warranted,
- Non-narcotic and narcotic medications
- Epidural steroid injections, transforaminal injections

In cases where conservative treatments prove ineffective for carefully chosen patients, Surgical intervention becomes appropriate course of action (Chan et al., 2019).

Case study: 69 y.o. female presented with 7/10 LBP, severe leg cramping 7/10. X-ray reveled Grade 2 spondylolisthesis at L4-L5 measuring 13.3 mm.

Intervention: 60 sessions of Mirror Image® spinal exercises (chiropractic BioPhysics ®), smt, And Lumbar traction over 45 weeks.

Post-treatment lateral lumbar x-ray showed a decrease in translation of L4-L5 from 13.3mm to 2.4 mm, within normal. Additional research needed for future treatment methods (Fedorchuk, 2017).

Spinal Gout

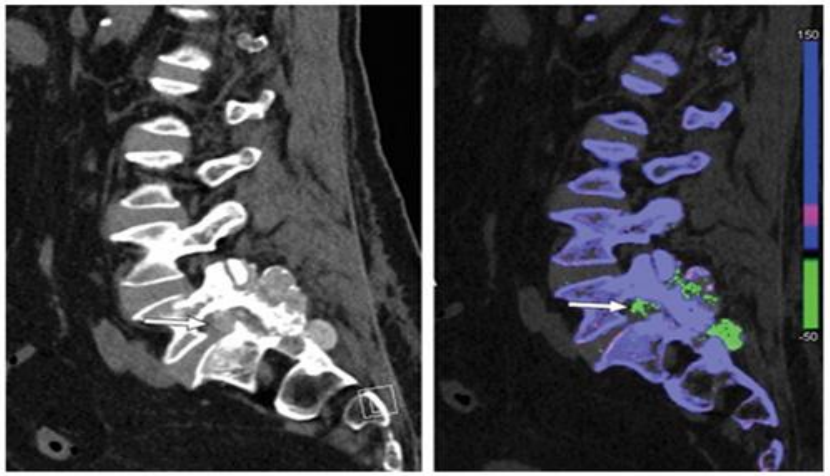
Improved recognition of spinal gout symptoms and earlier diagnosis via clinical findings, lab tests and dual-energy CT test with intervention could enhance patients' quality of life and potentially decrease the necessity for surgical procedures (McConville & Cox I, 2023).

Spinal gout can be present in up to 29% of patients with gout.

A systematic review of the diagnostic accuracy of DECT in gout found a pooled sensitivity of 88% and a specificity of 90%

(Toprover, 2022).

Dual-Energy CT of Spinal Tophaceous Gout



In a 67-year-old man with atraumatic back pain, dual-energy CT showed intermediate density mass in L5-S1 facet joint (left); dual-energy material labelling color map overlay (right) indicated monosodium urate deposits (green) and bone (blue and pink), confirming tophaceous gout.

(Gibney, 2020)

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https://doi.org/10.1148/radiol.2020200816

Radiology

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Radiology

- Change Potential- support for change; clinical training, resources, administrative & staff work processes
- Alternatives to change -Rising disability, rising costs for healthcare for system and patient dissatisfaction, depression, potential opioid overuse
- Clinician input, collaboration
- Hero: Clinicians, healthcare systems and the patient

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(Juneja, n.d.)

Thank You !

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