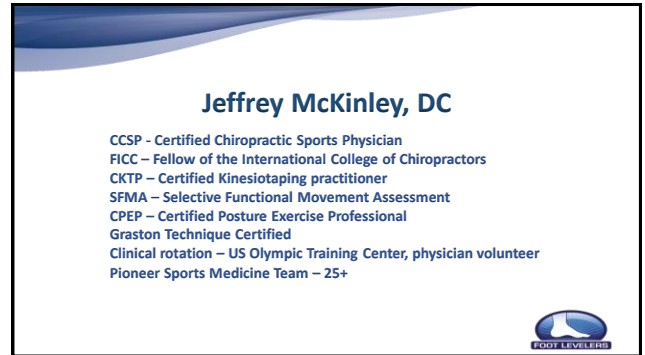
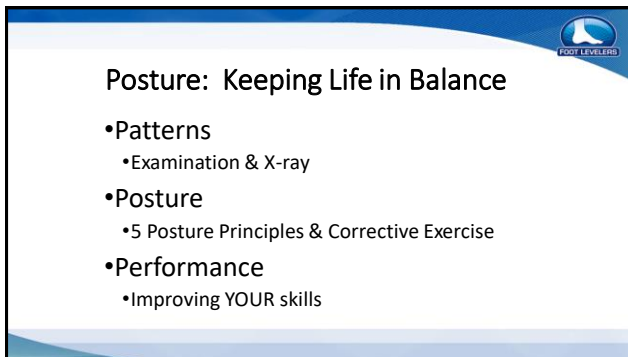


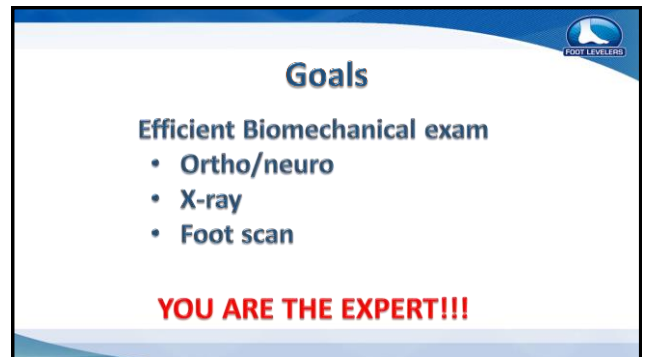
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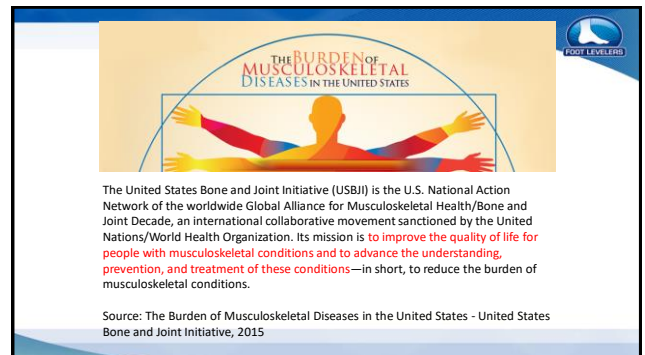
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Foreword

In March 2002, President George W. Bush declared the years 2002-2011 the **National Bone and Joint Decade**. The mission of the U.S. Bone and Joint Decade is to "promote and facilitate collaboration among organizations committed to improving bone and joint health through education and research".

Musculoskeletal disorders and diseases are the leading cause of disability in the United States and account for more than one-half of all chronic conditions in people over 60 years of age in developed countries. The economic impact of these conditions is also **staggering**. In 2004, the sum of the direct expenditures in health care costs and the indirect expenditures in lost wages for persons with musculoskeletal disease diagnosis has been estimated to be **\$49 billion dollars, or 7.7% of the national gross domestic product**.

CPOYA
1998-2008 American Academy of Orthopaedic Surgeons, From The Border of Musculoskeletal Diseases in the United States

23



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Spine Procedures

While nonsurgical treatment for back pain is the treatment of choice, spine surgery becomes an option when neck and low back pain is disabling and not responding to nonoperative treatment alternatives.

In 2007, just under 1.187 million procedures for the eight most common spine procedures were performed on 662,400 patients. In 2011, the number of patients had increased to 741,700, but total procedures for the same eight common procedures jumped even more to 1.391 million. **This is an increase in the number of procedures by 17%, but only a 12% increase in the number of patients.**

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BY THE NUMBERS
Musculoskeletal Back Pain
Back and neck disorders, injuries, and disk disorders

Back and Neck Conditions

- Back/Neck Disorders: inflammatory/arthritis, spondylosis, stenosis, lumbago, sciatica
- Injuries: fractures, dislocations, sprains
- Disk Disorders: herniation, degeneration

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BY THE NUMBERS
Musculoskeletal Back Pain
Back and neck disorders, injuries, and disk disorders

Economic Impact: Lost Work Time and Wages


- **\$150.4 billion**: hospital cost to treat back pain**
- **291 million**: lost work days due to back and neck pain***
- **\$131.8 billion**: annual earnings loss for persons with back/neck condition**

* 2010, ** 2011, *** 2012

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Beyond these statistics, the human toll in terms of the **diminished quality of life is immeasurable**. This situation is **unlikely to improve in the foreseeable future** and **will likely be intensified by current demographic trends**, including the graying of the baby boomer population, the epidemic of morbid obesity, and the higher recreational activity levels of our elderly population.

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New Data on Musculoskeletal Disease Highlight its Position as Major Contributor to Health Care Costs (Published Jan. 2018)

According to USBJI, more than half of all adults in the US now report a chronic musculoskeletal condition—a rate that outpaces the prevalence of reported respiratory conditions (24%) and circulatory conditions including high blood pressure (42%). **Chronic low back pain, joint pain, and disability make up 3 of the top 5 most commonly reported medical conditions, the report states.**




29




In turn, musculoskeletal conditions have become a major factor in health care costs—an **estimated \$332 billion between 2012 and 2014, according to USBJI, with costs likely to increase with an aging US population.**


"In spite of [the overall prevalence and significant costs], research funding for musculoskeletal-related conditions remains substantially below that of other major health conditions, such as cancer and respiratory and circulatory diseases," the report states. **"If health care costs in the future are to be contained, musculoskeletal diseases must come to the forefront of research."**



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THE OPIOID CRISIS AND YOU




31

Presented by
Mark Charrette, DC

AN AMERICAN EPIDEMIC


A Survey of the Opioid Crisis...
And the Cure.



32

Common Opioids

- Codeine
- Hydrocodone (Vicodin®, Hycodan®)
- Morphine (MS Contin®, Kadian®)
- Oxycodone (OxyContin®, Percocet®)
- Hydromorphone (Dilaudid®)
- Fentanyl (Duragesic®)




Sources: Melemis, Steven. "Opioids - Opiates: Addiction, Withdrawal, Crisis, Recovery Facts." I Want to Change My Life, 21 Sept. 2018. www.addictionsandrecovery.org/opioid-opiate-recovery.htm.


33

OPIOIDS

The economic burden to the U.S. is an estimated
\$504 billion a year.



34




WHAT WENT WRONG?

The points of origin just presented, resulted in the following:

- Pain became a 5th vital sign in health care and any pain was aggressively treated with drugs that were not intended for common pain use
- Opioids, such as Oxycontin, were promoted as being less addictive and to be used far more widely and liberally by pharmaceutical companies, Purdue in this case

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WHAT WENT WRONG?




- Opioids were intended for use in treating cancer related pain or post-surgical pain.
- The use of opioids in pain management in other circumstances is recommended by Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA) and Institute of Medicine (IOM) to be 3 DAYS
- Direct-to-consumer advertising caused the public to expect, even demand, opiates for conditions they weren't intended for.

36

2017, the leading cause of death in adults under age 50:

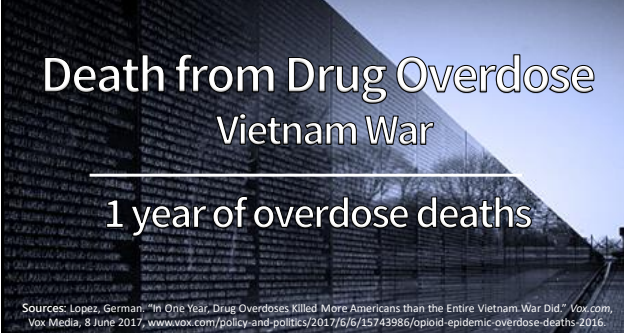
Death from Drug Overdose

More than all combined deaths from:

Breast Cancer	Car Accidents	AIDS
 +1,000	 +18,000	 +

Sources: Hedegaard H, Warner M, Miniño AM. Drug overdose deaths in the United States, 1999–2016. NCHS Data Brief, no 294. Hyattsville, MD: National Center for Health Statistics. 2017.

37



Death from Drug Overdose


Vietnam War

1 year of overdose deaths

Sources: Lopez, German. "In One Year, Drug Overdoses Killed More Americans than the Entire Vietnam War Did." Vox.com, Vox Media, 8 June 2017. www.vox.com/policy-and-politics/2017/6/8/15743986/opioid-epidemic-overdose-deaths-2016.


38

More Americans use prescription opioids than smoke cigarettes.



Sources: Clarke, Toni. "Surgeon General Report Tackles Addiction." Scientific American, Reuters, www.scientificamerican.com/article/surgeon-general-report-tackles-addiction/.

39



WHAT ARE THE RESULTS?


Opioid use and abuse by Americans is now rampant and out-of-control

- Opioids are prescribed at an annual rate that could give every American a 30-day supply
- Americans consume 99% of the world's production of opiates
- Opioids use and abuse is now responsible for more deaths than from ALL illicit drug use combined—this includes cocaine, heroin, methamphetamines etc.

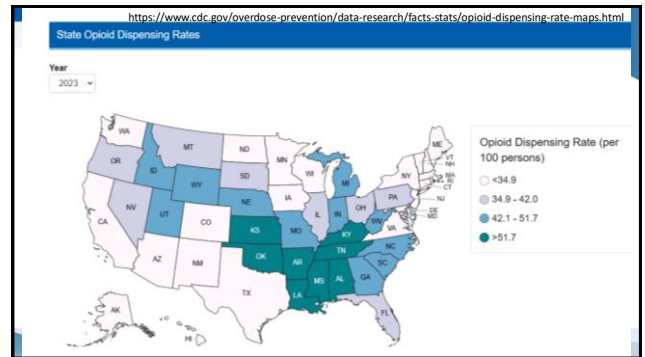
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WHAT ARE THE RESULTS?

- More than 6 Americans are dying from opioid abuse every hour of every day of the year
- People addicted to prescription opioid drugs are 40X more likely to become heroin addicts than non-prescription opioid addicts



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PTJ

Volume 104, Issue 10
October 2024

The Influence of Active, Passive, and Manual Therapy Interventions on Escalation of Health Care Events After Physical Therapist Care in Veterans With Low Back Pain

Get access

John M Mayer, DC, PhD, Michael Jason Highsmith, DPT, PhD, Jason Maikos, PhD, Charity G Patterson, PhD, Joseph Kakyomya, MS, Bridget Smith, PhD, Nigel Shenoy, MD, Christopher L Dearth, PhD, Shawn Farrokhi, DPT, PhD

Physical Therapy, Volume 104, Issue 10, October 2024, pzae101, <https://doi.org/10.1093/ptj/pzae101>

Published: 20 July 2024 Article history

Cite Permissions Share

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PTJ

Volume 104, Issue 10
October 2024

primary care, specialty care, and urgent care settings were 30% to 40% higher for patients who received electrical stimulation or more than 1 passive intervention in addition to active treatments, as compared with patients who received only active interventions.

Conclusion

The use of manual therapy along with active interventions was associated with reduced prescription of opioids, while utilization of specific passive interventions such as electrical stimulation or multiple modalities in conjunction with active interventions resulted in increased escalation-of-care events.

44

Home > Journal of General Internal Medicine > Article

Association of Opioid Use Disorder Diagnosis with Management of Acute Low Back Pain: A Medicare Retrospective Cohort Analysis

Original Research | Published: 03 June 2024
Volume 39, pages 2097–2105, (2024) Cite this article

Journal of General Internal Medicine

Conclusions

Medicare beneficiaries with aLBP and OUD underutilized nonpharmacologic pain therapies and commonly received opioids at high doses and with gabapentin. Complementing the promulgation of

45

A NATURAL SOLUTION TO THE OPIOID CRISIS

\$874,000,000,000

"Musculoskeletal pain, led by spinal disorders, costs the US healthcare system \$74 billion dollars per year and is the most common cause of severe long-term pain and disability."^{1,2,3}

46



Most musculoskeletal problems are caused by "mechanical" triggers, like falls, poor posture, and strains that are not well addressed by "chemical" drug treatments. In fact, some chemical treatments trigger undesired consequences.

**61,000
OVERDOSES**

"In 2017, a total of 61,311 people died from drug overdoses - many (70%) from prescription opioid medicine." (4)

National Safety Council




**4 X
INCREASE**

"From 1999 to 2008, overdose death rates and substance use rates quadrupled in parallel to sales of prescription pain relievers." (5)

CDC

47




"Among patients with acute low back pain, spinal manipulative therapy was associated with improvements in pain and function with only transient minor musculoskeletal harms." (6)

Journal of the AMA

"It is unlikely that chiropractic care is a significant cause of injury in older adults. In fact, among Medicare beneficiaries aged 66 to 99 years, risk of injury to the head, neck, or trunk within 7 days was 76% lower among subjects with a chiropractic office visit than those who saw a primary care physician." (7)

Spine Journal


48





CHIROPRACTIC CARE CARRIES A SIGNIFICANTLY LOWER SOCIAL COST WHEN COMPARED TO OPIOIDS.

"Patients with spinal pain who saw a chiropractor had half the risk of filling an opioid prescription. Among those who saw a chiropractor within 30 days of diagnosis, the reduction in risk was greater as compared with those with their first visit after the acute phase." (8)

"The rate of opioid use was lower for recipients of chiropractic services (19%) as compared to non-recipients (35%). The likelihood of filling a prescription for opioids was 55% lower in the chiropractic recipient cohort. Average annual per person charges for opioid prescription fills were 78% lower for recipients of chiropractic services as compared to non-recipients. Average per person charges for clinical services for low back pain were also significantly lower for recipients of chiropractic services. (Avg. \$1513 for chiropractic management vs. \$6766 for medical management)" (9)




49

PAY ATTENTION!


**We have the answers
to this musculoskeletal
crisis!**

55




**Chiropractic is a profession,
not a form of treatment.**

56



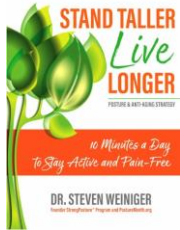
**What are forms of
treatment
provided in your office?**

57



Dr. Steven Weiniger | Posture Expert

Dr. Weiniger wrote the book on better posture



FOOT LEVELERS

60

Thank you



Dr. Tim Bertelsman, DC, CCSP, DACO
CO-FOUNDER



Dr. Brandon Steele, DC, DACO
CO-FOUNDER


CHIROUP

OUR MISSION
To unite and elevate evidence-based chiropractors

FOOT LEVELERS

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Current MS Approach



spotek

FOOT LEVELERS

65

Pre-Season Physical

Eyes	_____
Ears (Otoscopy)	_____
Lymph Nodes	_____
Thyroid	_____
Nose	_____
Tonsils	_____
Teeth	_____
Heart	_____
Blood Pressure	_____
Lungs	_____
Hernia	_____
Genito-Urinary	_____
Urine	_____

Scoliosis: positive _____ negative _____
follow-up _____


***Physician, please note: NY State Law requires scoliosis screening for all children between the ages of 8 and 16 years.

FOOT LEVELERS

66

When Young Athlete is Injured

- Athletic Trainer
- Pediatrician
- Orthopedist
- Physical Therapist-Discharge
- In the end, **no change**
- **Very Costly!!!!**

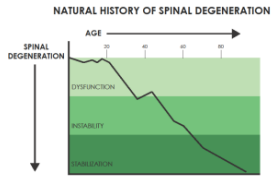


FOOT LEVELERS

67

3 Stages of Degeneration

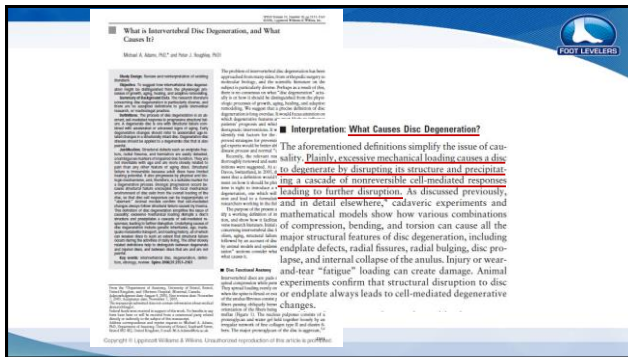
NATURAL HISTORY OF SPINAL DEGENERATION



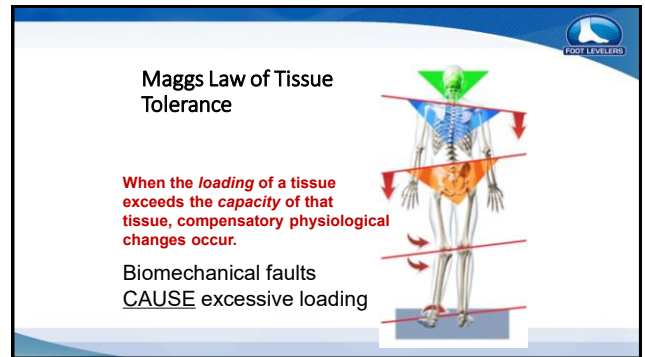
When do we begin?

FOOT LEVELERS

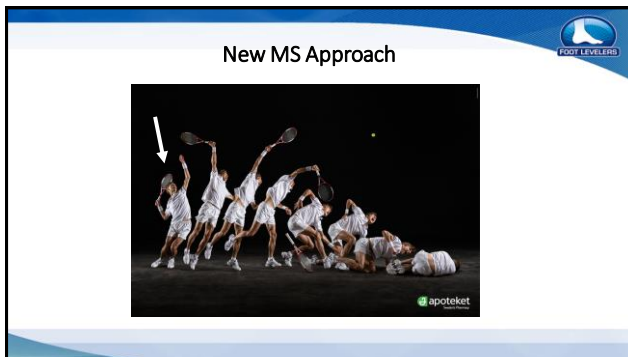
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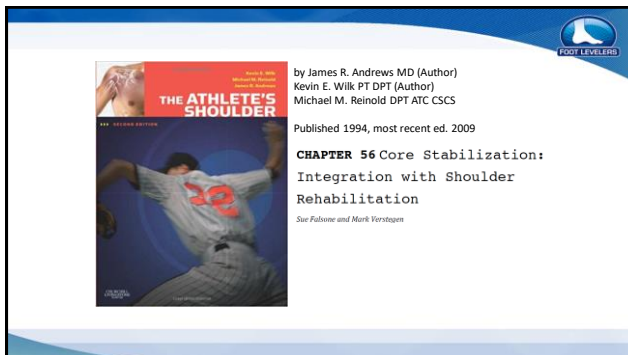
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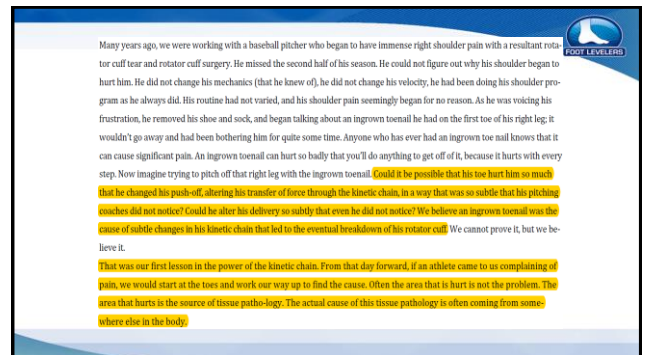
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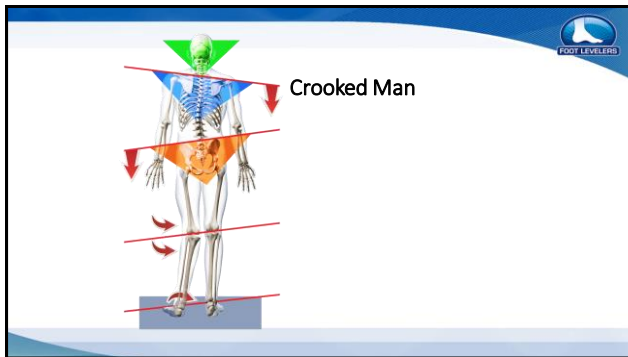
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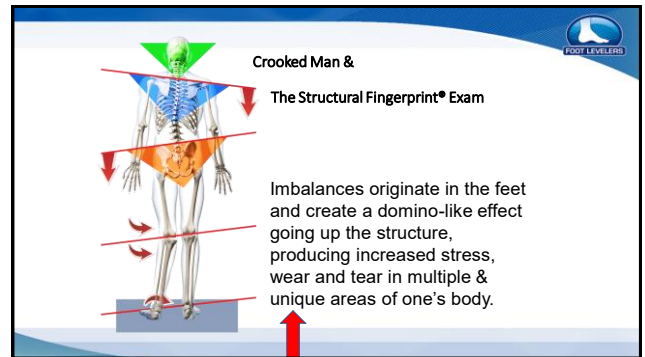
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Maggs Law of Tissue Tolerance

When the *loading* of a tissue exceeds the *capacity* of that tissue, compensatory physiological changes occur.

Weiniger – 5 Posture Principles

Motion>Balance>Patterns>Compensation>Adaptation

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PATIENT		DATE	
DOB	Shoe size	Width	HT
EXAM FORM CHIEF COMPLAINT: LBP L R B NECK PAIN L R B MBP L R B			
STANDING Arch: BN - # Q Angle: N + L R B Toe Walk: N + ANK Inst Walk: N + ANK ROM: *Flex: L R B Pain *Ext: L R B Pain *Lat Flex: L R B Pain *Lat Ext: L R B Pain *R Flex: L R B Pain *R Ext: L R B Pain *L Flex: L R B Pain *L Ext: L R B Pain *R Flex: L R B Pain *R Ext: L R B Pain *L Flex: L R B Pain *L Ext: L R B Pain		PROBE C1: C1 Tenderness: + + + + + C2: C2 Hyperextension: + + + + + C3: C3: C1: C2: C3: C4: C5: C6: C7: C8: C9: C10: C11: C12: C13: C14: C15: C16: C17: C18: C19: C20: C21: C22: C23: C24: C25: C26: C27: C28: C29: C30: C31: C32: C33: C34: C35: C36: C37: C38: C39: C40: C41: C42: C43: C44: C45: C46: C47: C48: C49: C50: C51: C52: C53: C54: C55: C56: C57: C58: C59: C60: C61: C62: C63: C64: C65: C66: C67: C68: C69: C70: C71: C72: C73: C74: C75: C76: C77: C78: C79: C80: C81: C82: C83: C84: C85: C86: C87: C88: C89: C90: C91: C92: C93: C94: C95: C96: C97: C98: C99: C100: C101: C102: C103: C104: C105: C106: C107: C108: C109: C110: C111: C112: C113: C114: C115: C116: C117: C118: C119: 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STANDING									
Arch hts	=	≠							
Q Angle	N	↑	L	R	B				
Toe Walk	N	AbN							
Heel Walk	N	AbN							
ROM	*Flex	↓	↓	↓	↓	↓	↓	↓	Pain
	*Ext	↓	↓	↓	↓	↓	↓	↓	Pain
	R Lat Flex	↓	↓	↓	↓	↓	↓	↓	Pain
	L Lat Flex	↓	↓	↓	↓	↓	↓	↓	Pain
	*R Rot	↓	↓	↓	↓	↓	↓	↓	Pain
	*L Rot	↓	↓	↓	↓	↓	↓	↓	Pain
	*CS Flex	↓	↓	↓	↓	↓	↓	↓	Pain
	Ext	↓	↓	↓	↓	↓	↓	↓	Pain
	L Rot w/ lat flex	↓	↓	↓	↓	↓	↓	↓	Pain
	R Rot w/ lat flex	↓	↓	↓	↓	↓	↓	↓	Pain
*Shoulder									
(under)	R Flex w/ int rot	FN	FP	DP	DN				
(under)	L Flex w/ int rot	FN	FP	DP	DN				
(over)	R Ext w/ int rot	FN	FP	DP	DN				
(over)	L Ext w/ int rot	FN	FP	DP	DN				

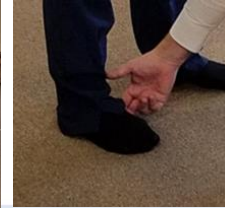
Begin from the bottom and work your way up.

FN = functional normal
FP = functional painful
DP = dysfunctional painful
DN = dysfunctional non-painful

Selective Functional Movement Assessment terminology.

Check Arch Height

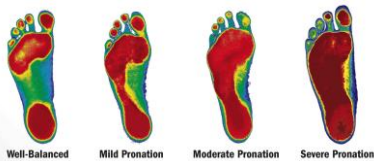
Don't worry about mild, moderate, or severe!



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Optimal, Mild, Moderate or Severe?



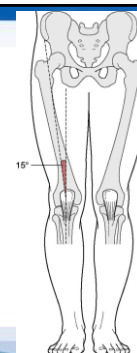
85

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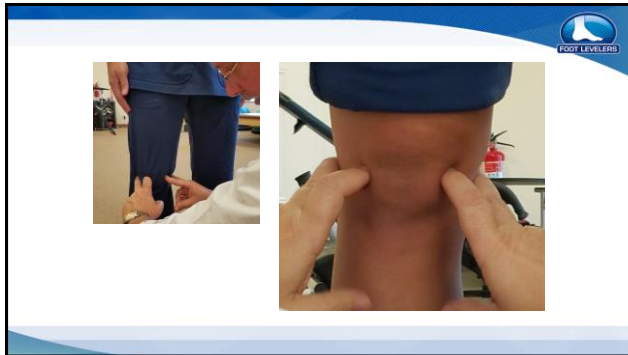
Check Q angle



Q angle - the angle formed by a line drawn from the anterior superior iliac spine through the center of the patella and a line drawn from the center of the patella to the center of the tibial tubercle.

Q angle - McKinley definition:
make sure the knee cap is in the middle of the knee.

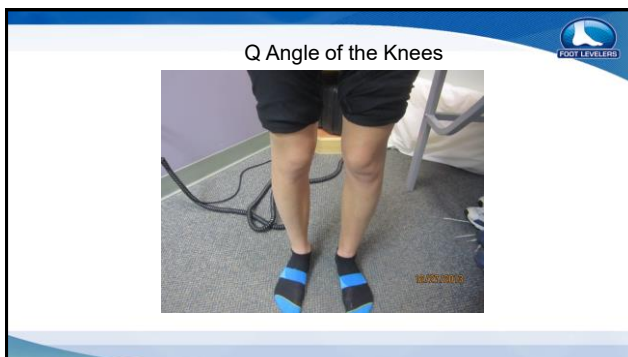
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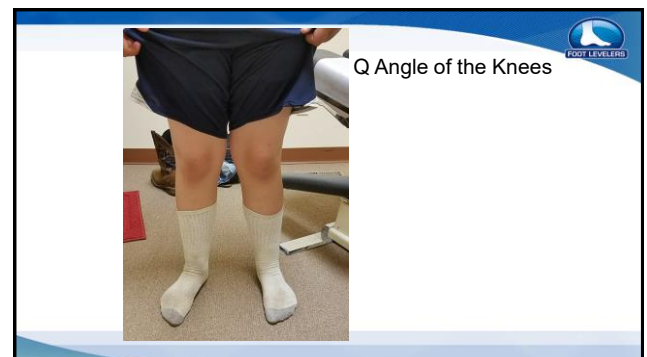
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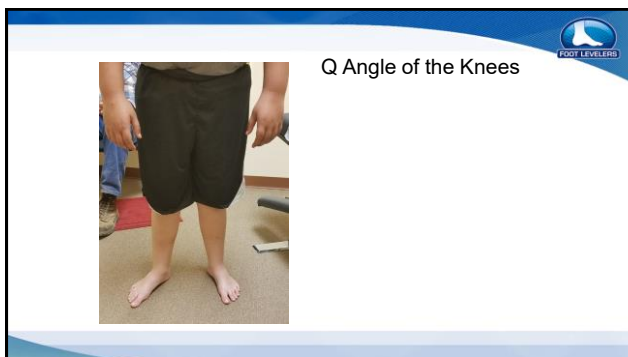
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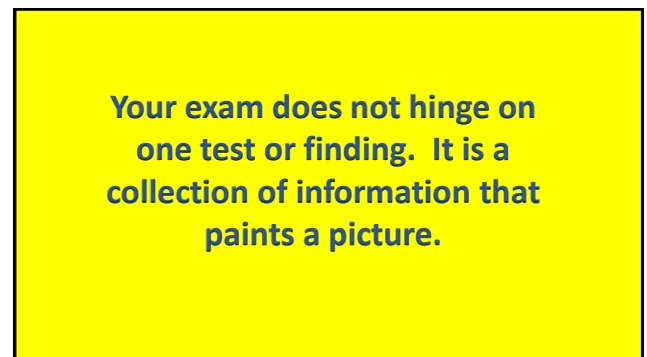
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92



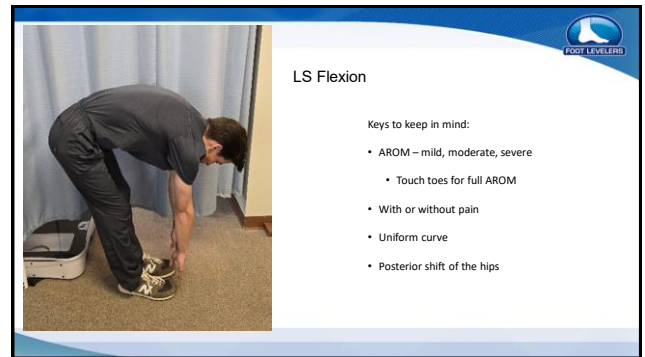
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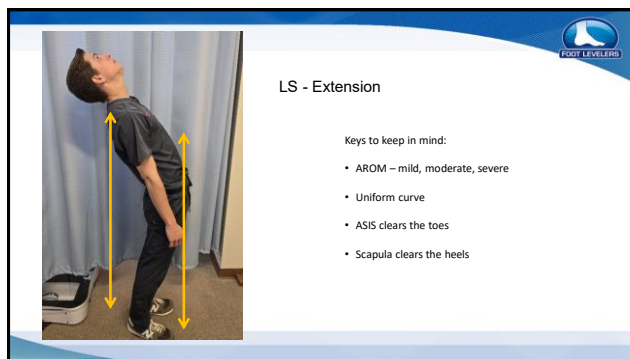
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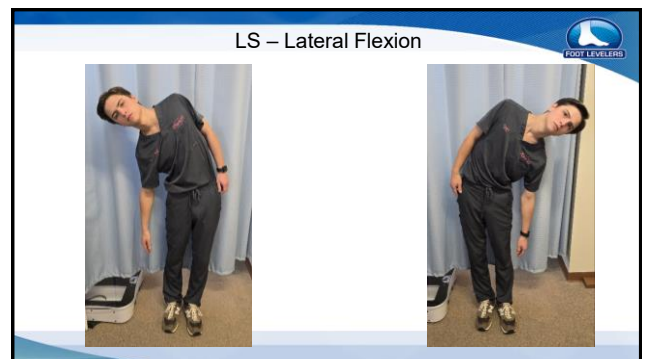
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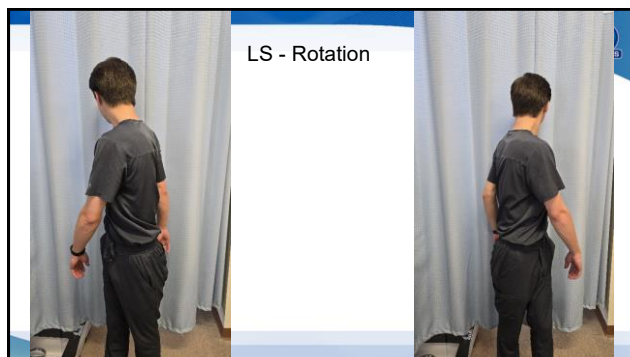
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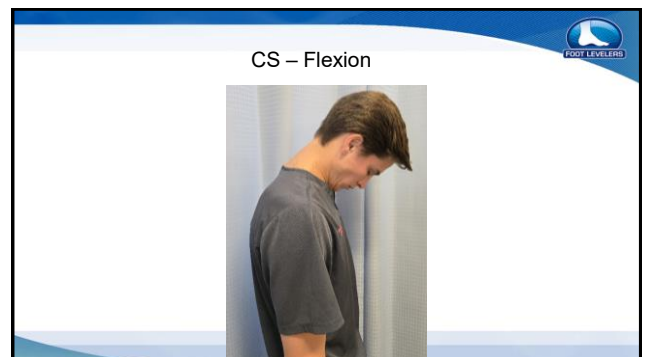
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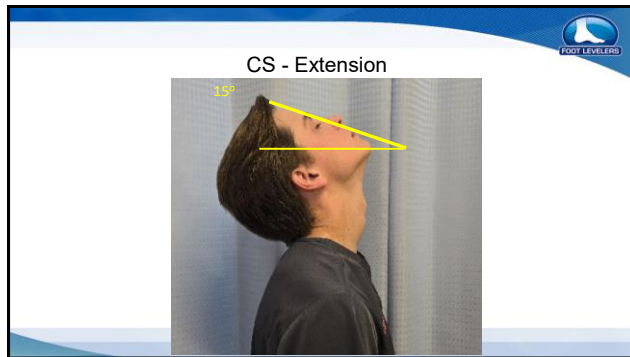
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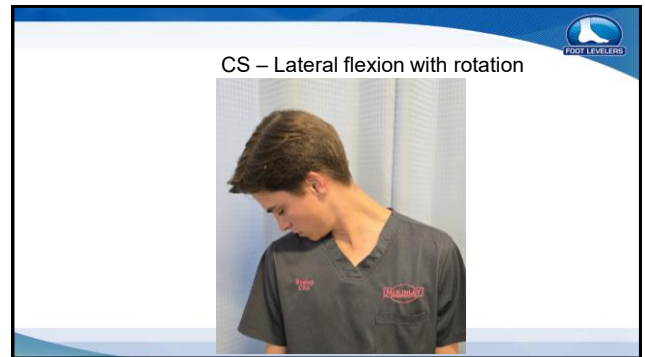
101



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STANDING

Arch hts = ≠

Q Angle N ↑ L R B

Toe Walk N AbN

Heel Walk N AbN

ROM *Flex ↓ ↓ ↓ ↓ Pain

*Ext ↓ ↓ ↓ ↓ Pain

R Lat Flex ↓ ↓ ↓ ↓ Pain

L Lat Flex ↓ ↓ ↓ ↓ Pain

*R Rot ↓ ↓ ↓ ↓ Pain

*L Rot ↓ ↓ ↓ ↓ Pain

*CS Flex ↓ ↓ ↓ ↓ Pain

Ext ↓ ↓ ↓ ↓ Pain

L Rot w/ lat flex ↓ ↓ ↓ ↓ Pain

R Rot w/ lat flex ↓ ↓ ↓ ↓ Pain

Kemp's L R B

106

SITTING

Minors - +

SSLR - + R L

LER 1+ 2+ 3+

LE Strength 5+ 4+ 3+

UER 1+ 2+ 3+

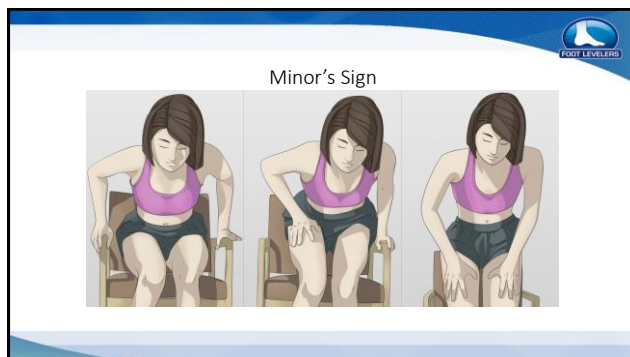
UE Strength 5+ 4+ 3+

CS Compression - + L R B

CS Distraction - + L R B

CS Max Foraminal Comp - + L R B

107



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Lower Extremity Reflexes
 Patellar
 Achilles

Upper Extremity Reflexes
 Biceps
 Brachioradialis
 Triceps

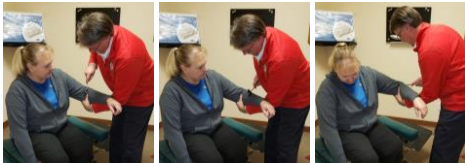
110

Patellar and Achilles




111

Biceps, Brachioradialis, and Triceps




112



113

Foot Eversion – Peronius Longus
 L5- S1



114

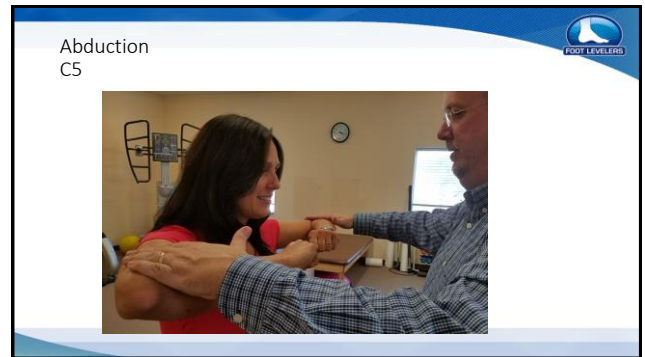
Foot Dorsiflexion – extensor hallucis longus
 L4-L5



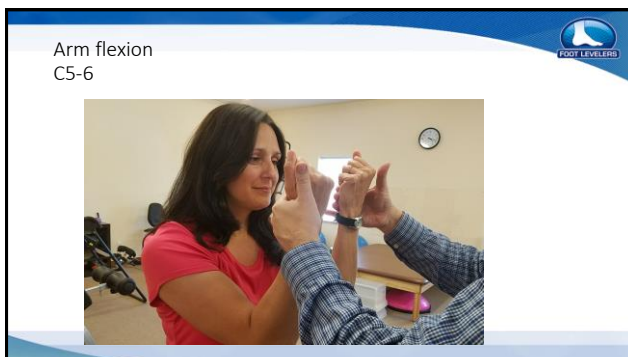
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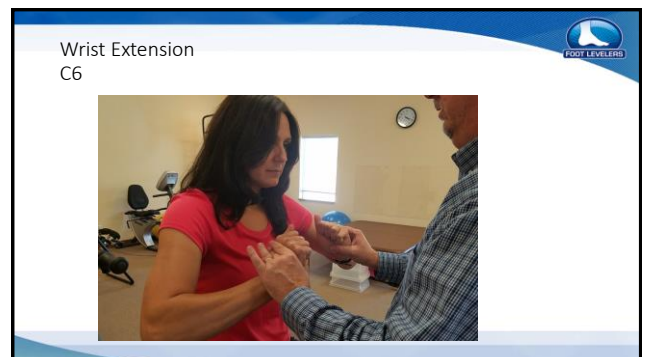
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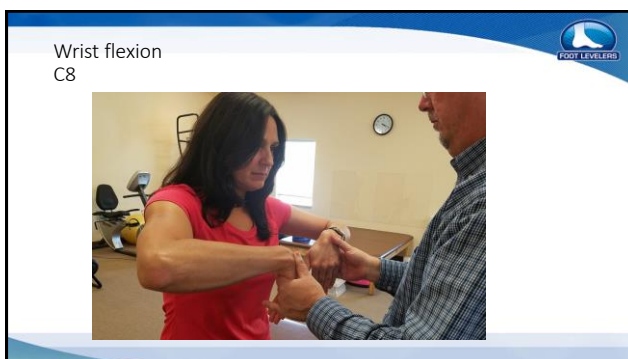
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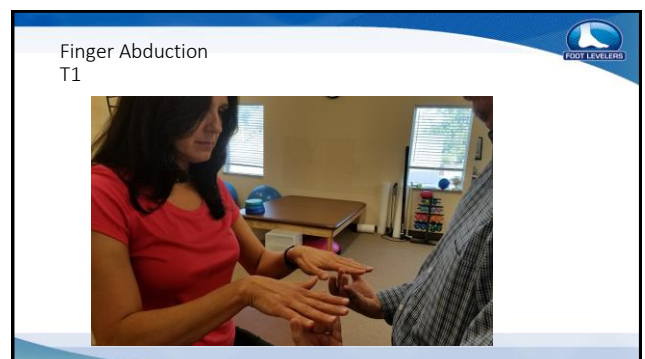
118



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120



121

Finger extension
C7



122

Finger flexion
C8



123

CS Compression



124

CS Distraction



125

Maximal Foraminal Compression



126

SITTING

Minors	-	+
SSLR	-	+ R L
LER	1+	2+ 3+
LE Strength	5+	4+ 3+
UER	1+	2+ 3+
UE Strength	5+	4+ 3+
CS Compression	-	+ L R B
CS Distraction	-	+ L R B
CS Max Foraminal Comp	-	+ L R B

127

<u>SUPINE</u>				
Gaenslen's	N	+	R	L
SLR	N	+	R	L \neq
Braggard's	N	+	R	L
Thigh Thrust	N	+	R	L
Hip Flex	N	+	R	L \neq
FABEr	N	+	R	L \neq
SI Distraction	N	+	R	L
Int Hip Rot	N	↓	R	L

128

Fig 2

Sacroiliac Joint Pain (3 or more of 6 tests)

3 or more positive SI joint tests with centralization? (+LR 3.9)..... ☐ Yes ☐ No

3 or more positive SI joint tests without centralization? (+LR 7.0)..... ☐ Yes ☐ No

1. Gaenslen's Left..... ☐ Yes ☐ No

2. Gaenslen's Right..... ☐ Yes ☐ No

3. Thigh thrust [symptomatic side] ☐ Yes ☐ No

4. Distraction ☐ Yes ☐ No

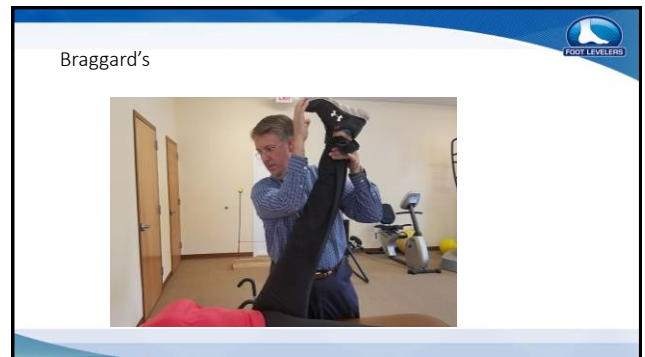
5. Iliac compression ☐ Yes ☐ No

6. Sacral thrust or Patrick's test..... ☐ Yes ☐ No

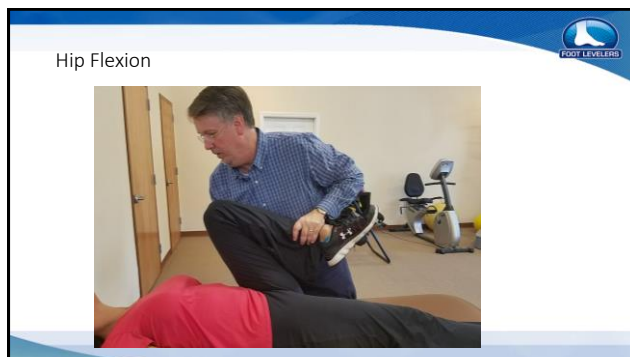
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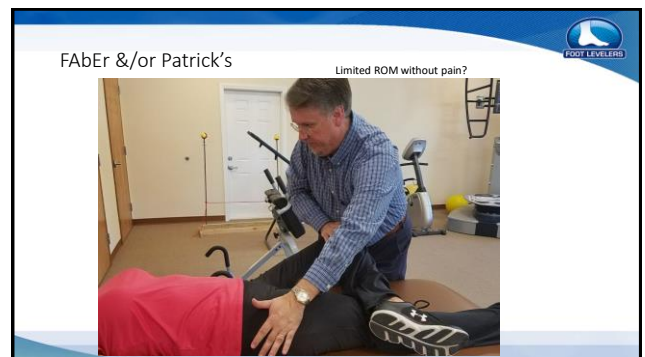
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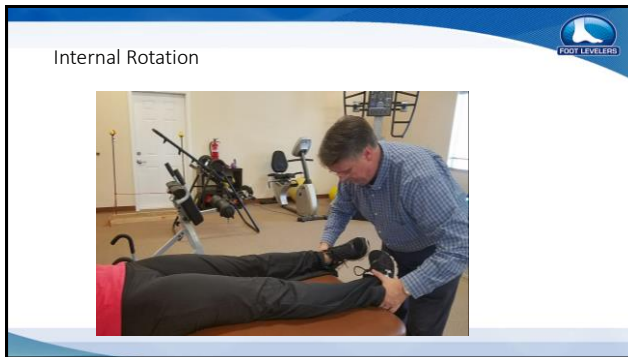
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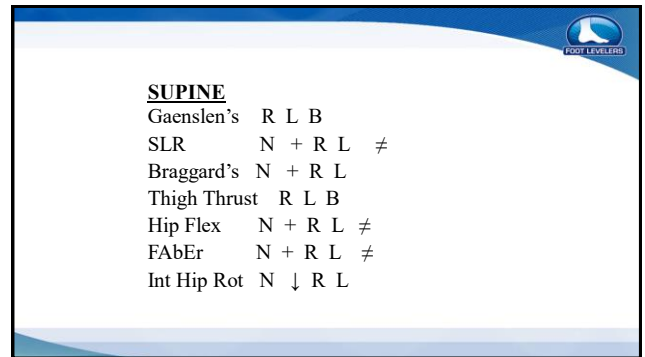
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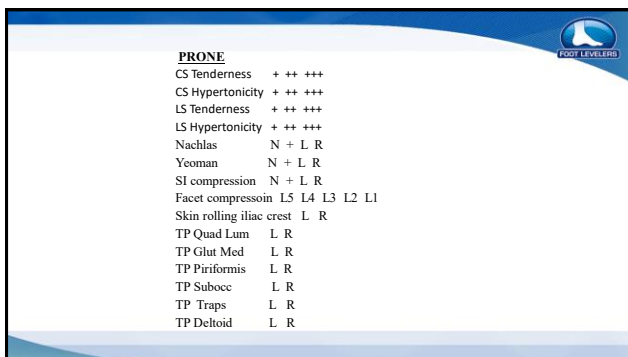
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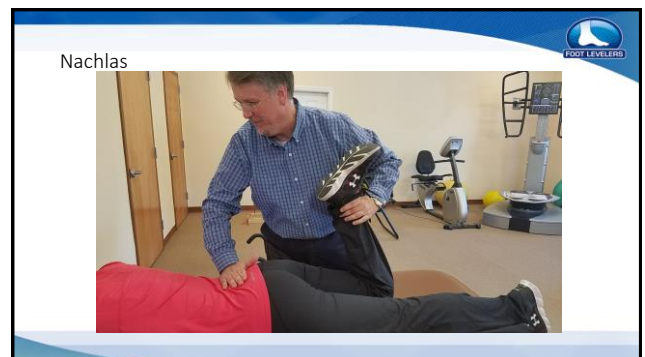
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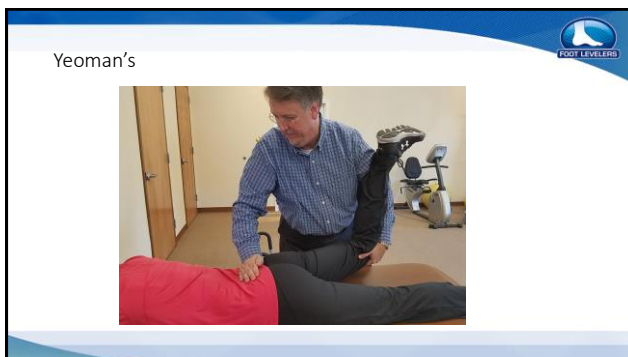
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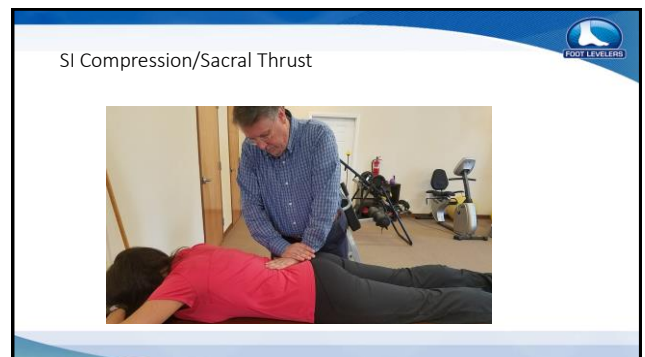
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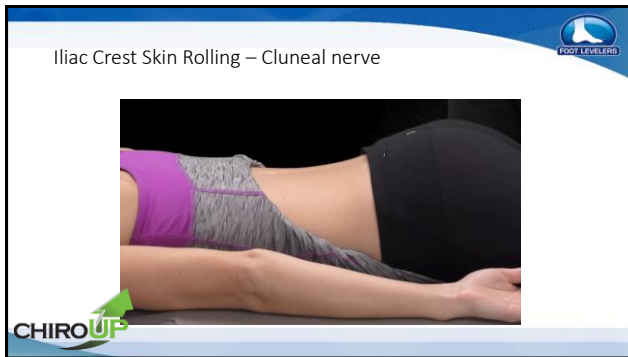
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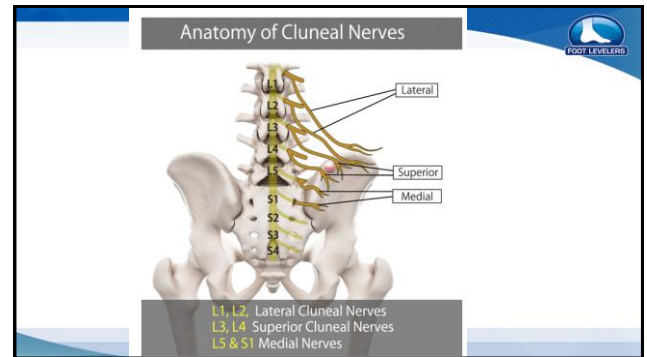
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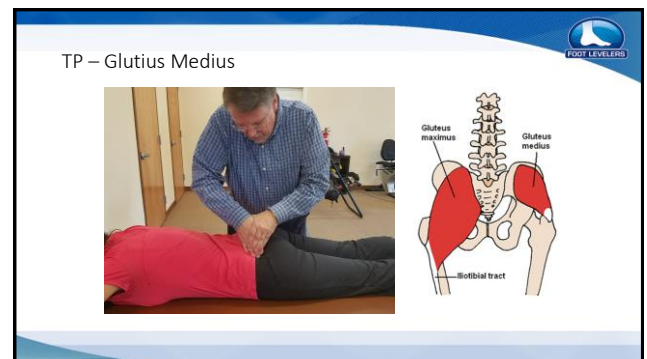
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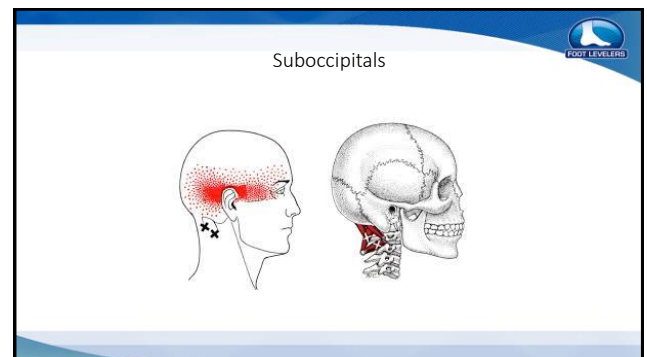
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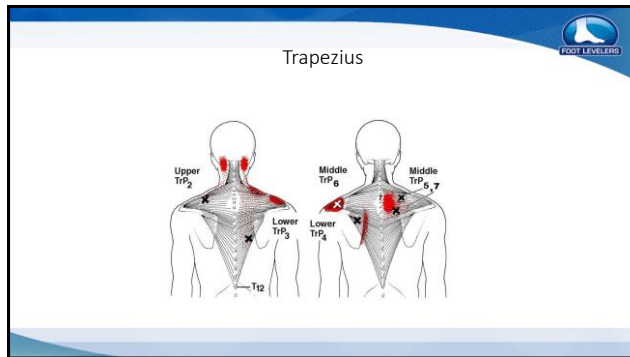
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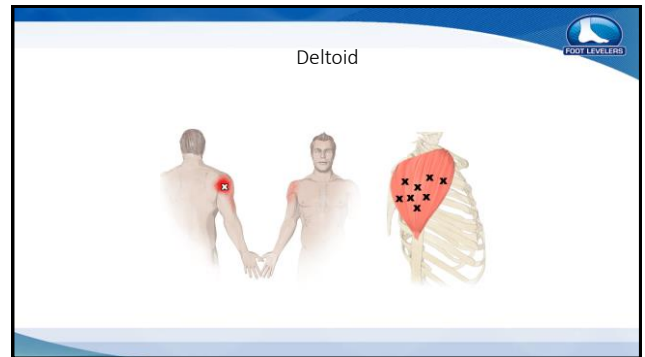
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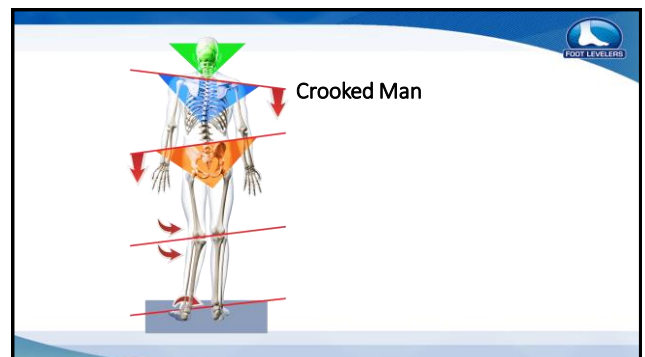


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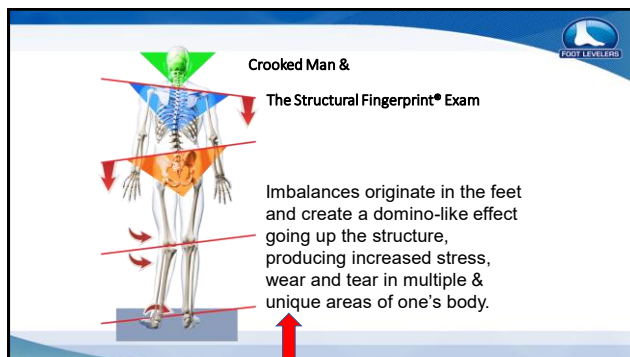
PRONE

CS Tenderness	+ + + +
CS Hypertonicity	+ + + +
LS Tenderness	+ + + +
LS Hypertonicity	+ + + +
Nachlas	N + L R
Yeoman	N + L R
SI compression	N + L R
Facet compression	L5 L4 L3 L2 L1
Skin rolling iliac crest	L R
TP Quad Lum	L R
TP Glut Med	L R
TP Piriformis	L R
TP Subocc	L R
TP Traps	L R
TP Deltoid	L R

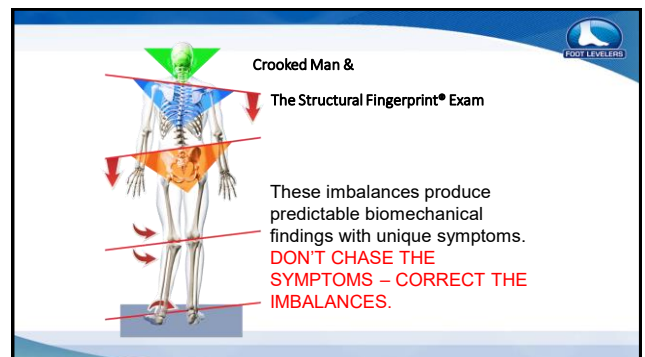
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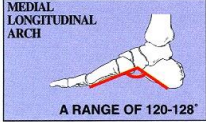
153



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Orthotics - Goal #1

Create a symmetrical foundation by blocking excessive pronation or supporting supination within the established normal angulation ranges.




MEDIAL LONGITUDINAL ARCH
A RANGE OF 120-128°

162

Orthotics - Goal #2

Provide heel strike shock protection

The natural heel strike shock absorption mechanisms are compromised with faulty pedal biomechanics making the individual more susceptible to **bone marrow edema and stress fractures**.




Foot Levelers uses ZORBACEL® for increased shock absorption

163

Orthotic - Goal #3

Reduce Injuries

With improved balance and balanced loading of all tendons, muscles and joints, total accumulated stress is reduced.



164

SCAN EVERY PATIENT


- Use the scan as an educational tool
- Show patients how the feet play an instrumental role in the care you provide
- Overpronation causes biomechanical dysfunction

EVERYONE
NEEDS CUSTOM ORTHOTICS
MAKE SCANNING
YOUR PROTOCOL



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**SAME PERSON
DIFFERENT FEET**

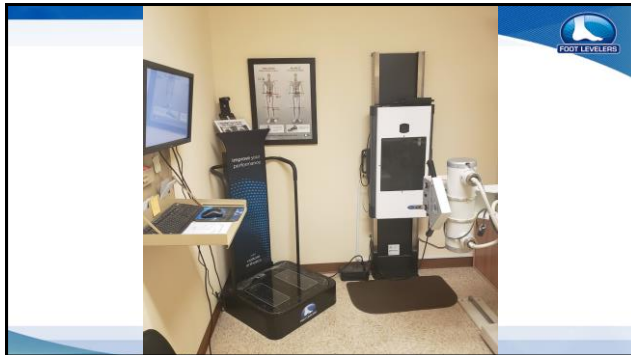


Scanning the feet shows immediately **asymmetrical overpronation**

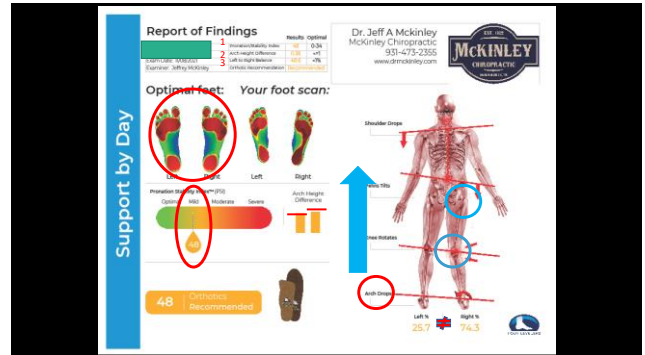
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**Creating
VISUAL EVIDENCE**

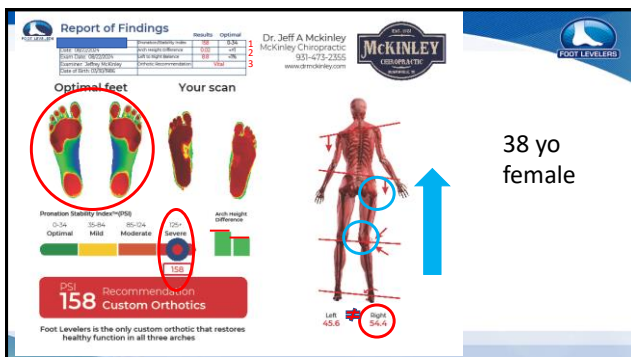
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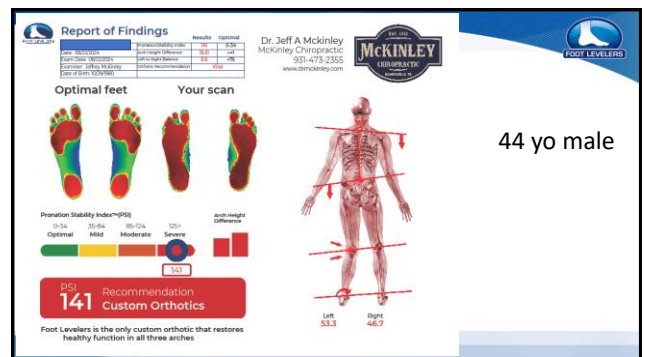
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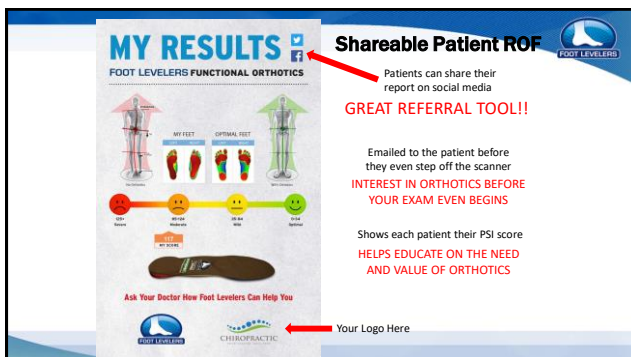
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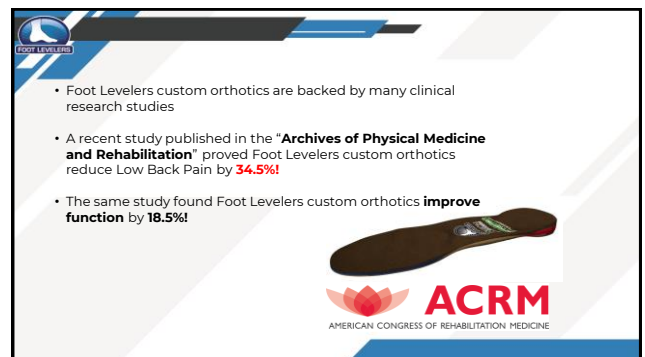
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SCIENCE BASED CHIRO

Foot Levelers Reduce LBP 34.5%

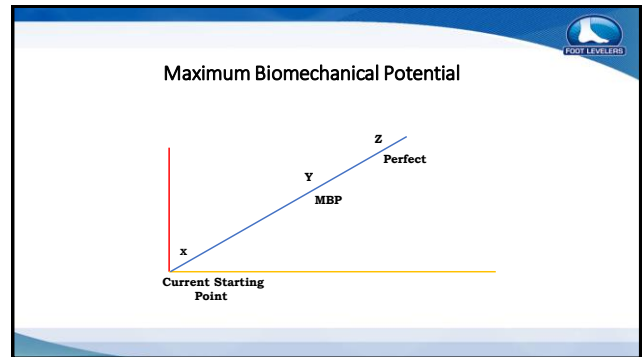


✓ Archives of Physical Medicine and Rehabilitation Research
Shoe Orthotics for the Treatment of Chronic Low Back Pain: A Randomized Controlled Trial - Six weeks of prescription shoe orthotics significantly improved back pain and dysfunction compared with no treatment. The addition of chiropractic care led to even higher improvements in function.

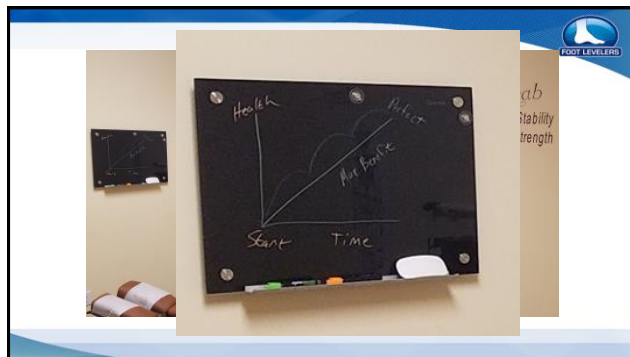
Source - [PeakMyHealth.link/FootLevelersLBPREsearch](https://peakmyhealth.link/FootLevelersLBPREsearch)



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180

ADJUST SUPPORT

Your adjustments correct the body.
...and the braces correct the teeth.

Foot Levelers custom-made orthotics help your adjustments hold better.
...and blue retainers keep the teeth aligned.

Ask Dr. McKinley about custom orthotics!

(930) 473-2355
dr@drmcKinley.com



181

Even with the best adjustment, you may still be off by 2 FEET!




Ask Dr. McKinley about Foot Levelers custom orthotics.

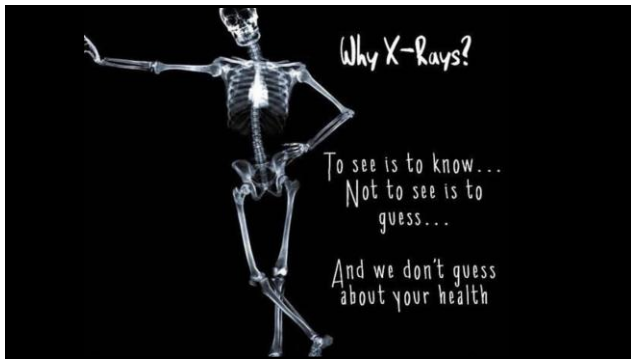


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X-ray Evaluation



184



185

X-RAY
 Cerv Grav Line A N
 Cervical Curve EN ↓ ↓ ↓ ↓ ↓ ↓ reverse
 Axis Rot EN
 Sacral Base Angle _____
 Fem Head Ht = ↓ L R
 Lum Grav Line A P N
 Obturators = ≠

186



187

Abnormal mechanical loading causes predictable changes

188

What is Intervertebral Disc Degeneration, and What Causes It?
 Michael S. Adams, PhD and Peter J. Roughley, PhD

Interpretation: What Causes Disc Degeneration?
 The aforementioned definitions simplify the issue of causality. **Think: excessive mechanical loading causes a disc to degenerate by disrupting its structure and precipitating a cascade of nonreversible cell-mediated responses leading to further disruption.** As discussed previously, and in detail elsewhere, **cellular experiments and mathematical models show how various combinations of compression, bending, and torsion can cause all the major structural features of disc degeneration, including endplate defects, radial fissures, radial bulging, disc prolapse, and internal collapse of the annulus. Injury or wear-and-tear "fatigue" loading can create damage.** Animal experiments confirm that structural disruption to disc or endplate always leads to cell-mediated degenerative changes.

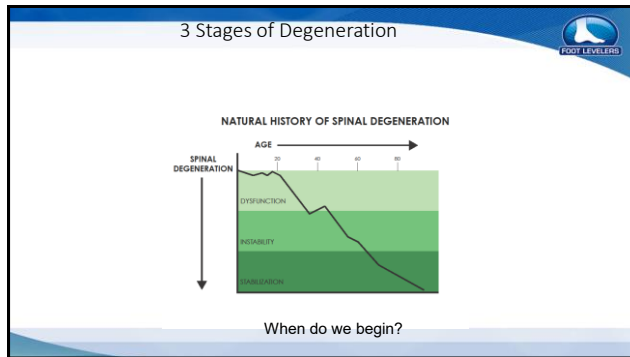
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Maggs Law of Tissue Tolerance

When the loading of a tissue exceeds the capacity of that tissue, compensatory physiological changes occur.

Weiniger – 5 Posture Principles
Motion>Balance>Patterns>Compensation>Adaptation

190



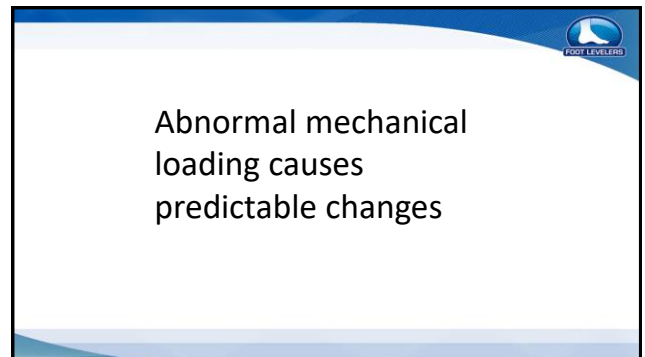
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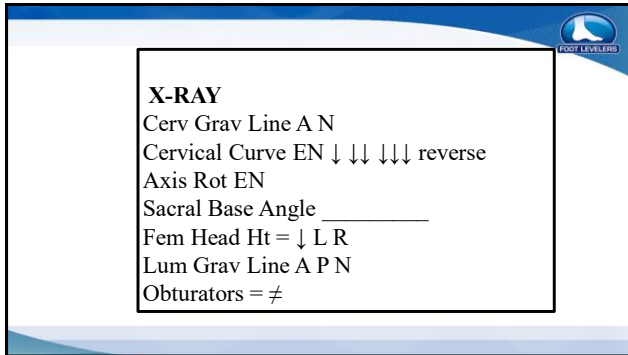
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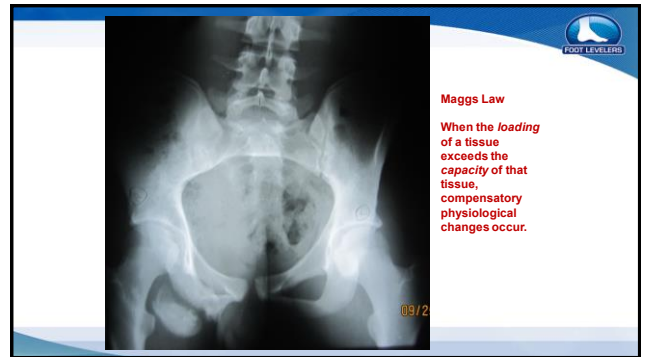
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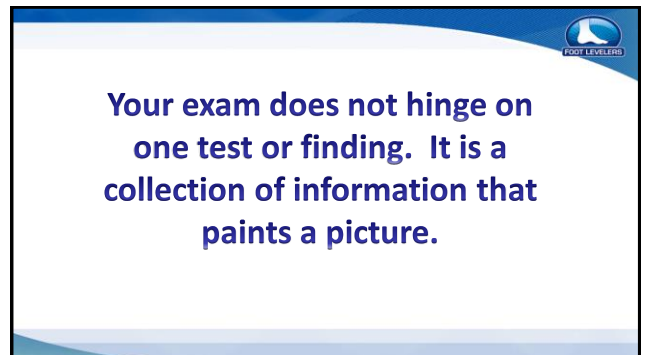
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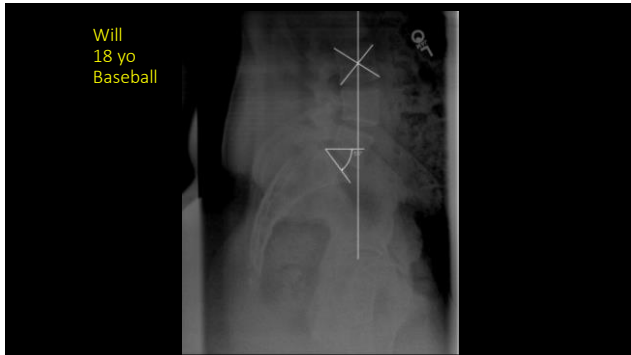


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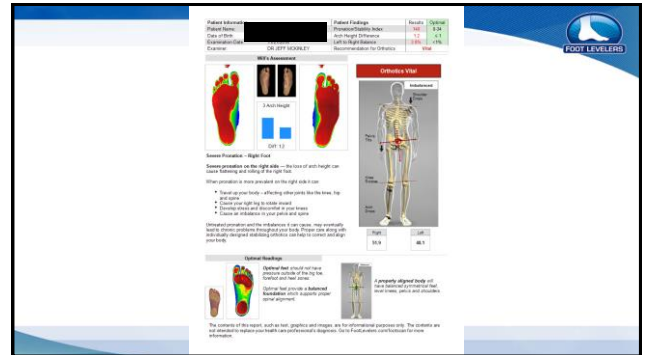


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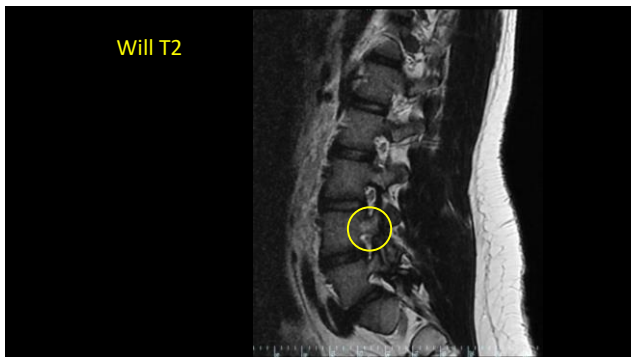
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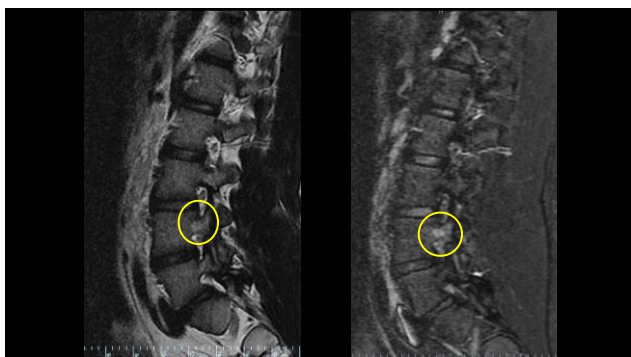
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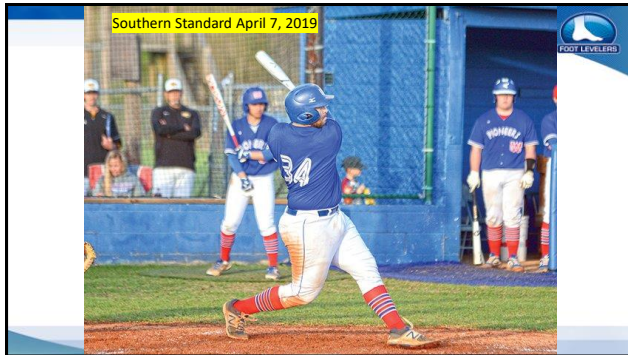
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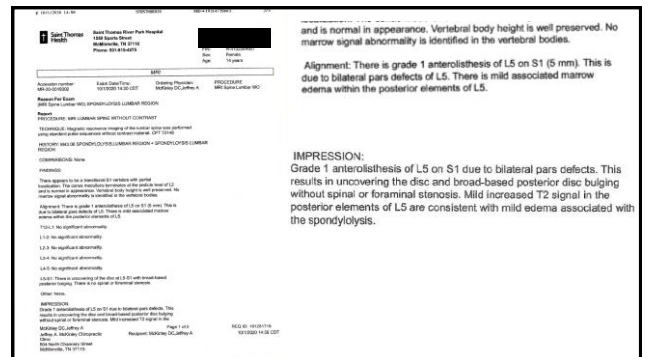
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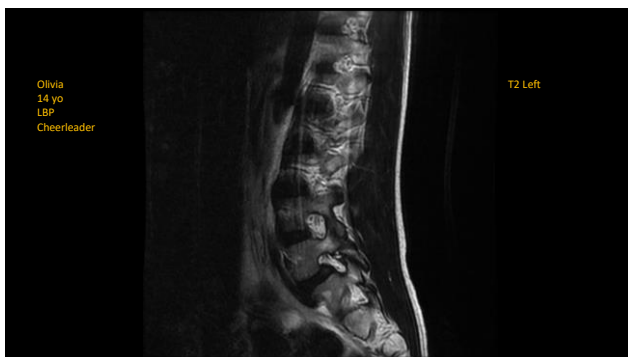
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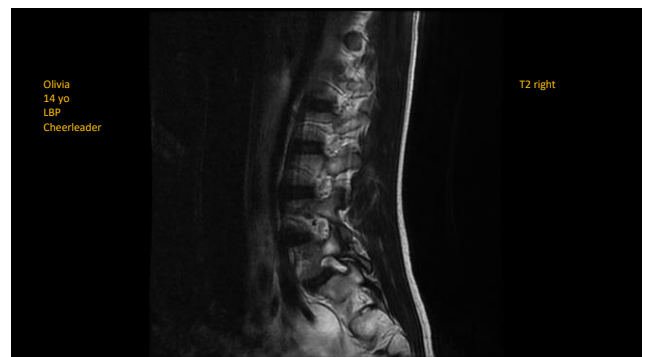
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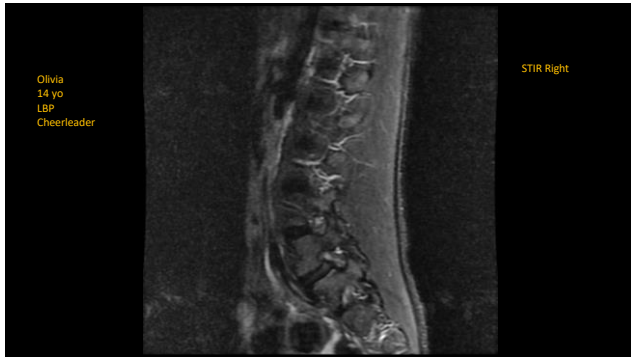
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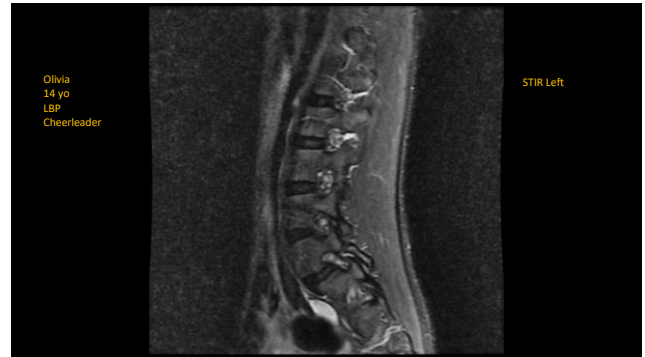
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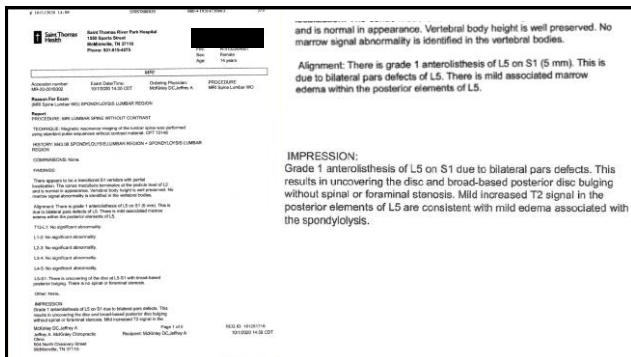
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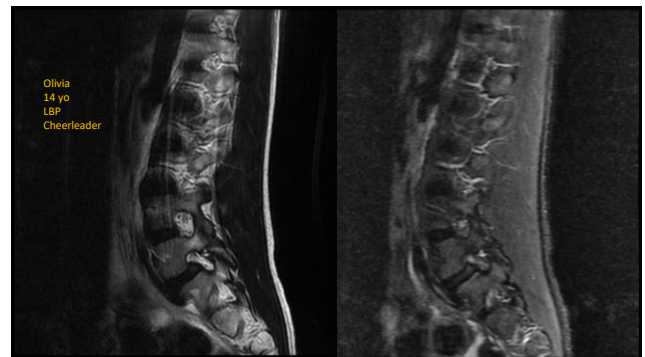
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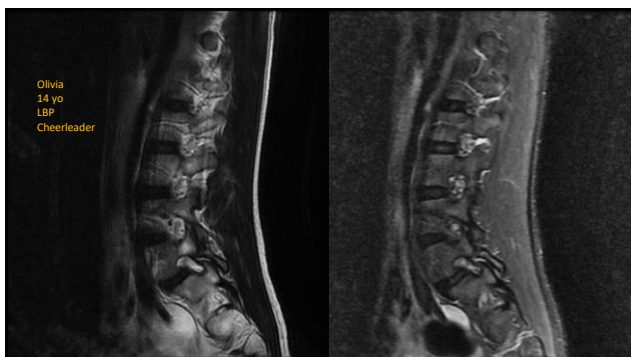
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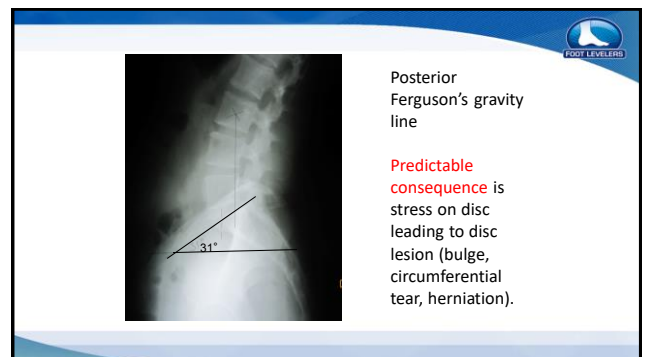
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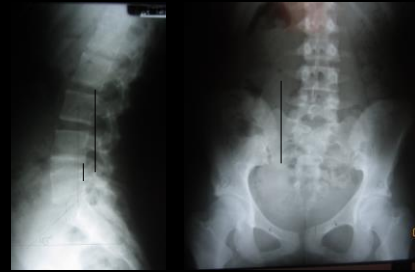
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15 y.o. female rower—2 yrs.
2 Bulging Discs



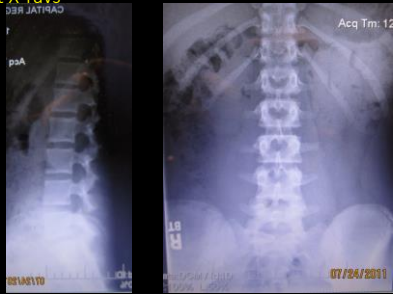
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Standing X-Rays



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Recumbant X-rays



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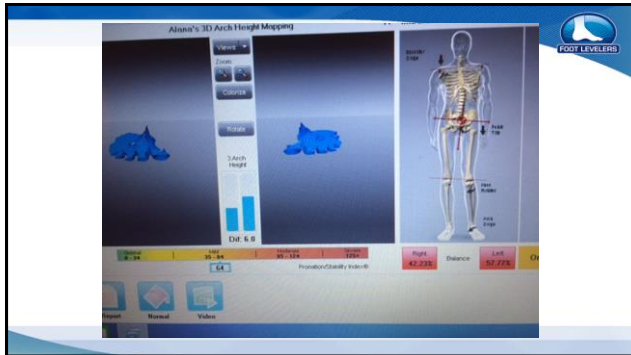
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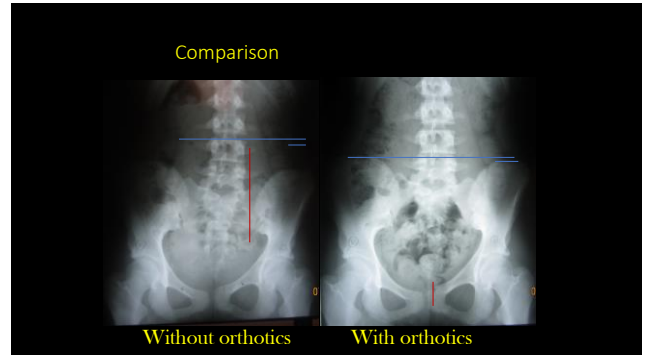
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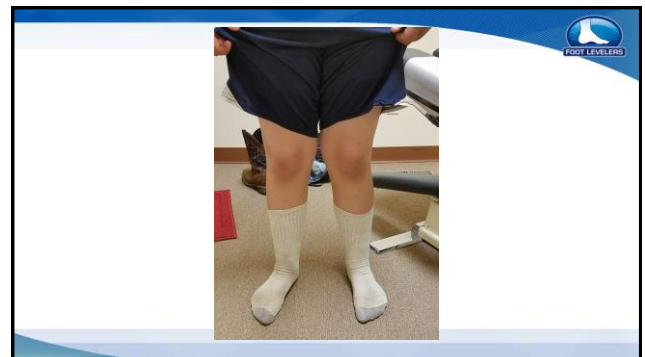
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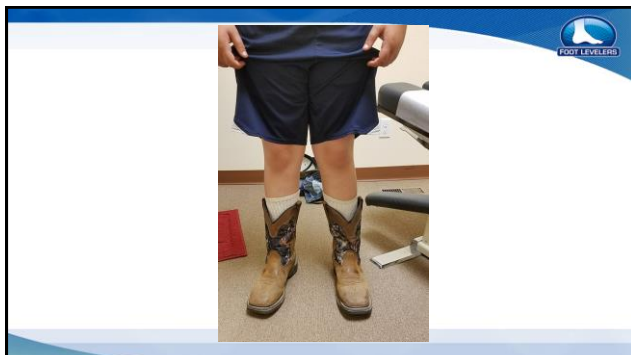
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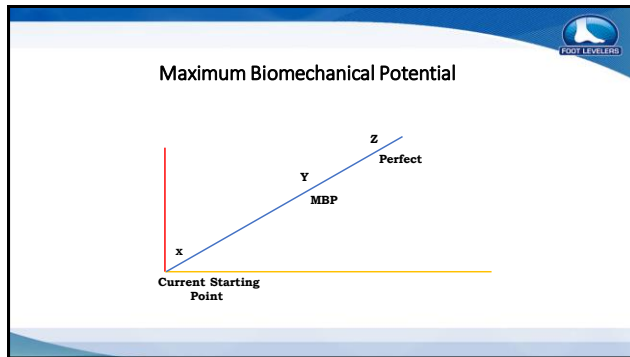
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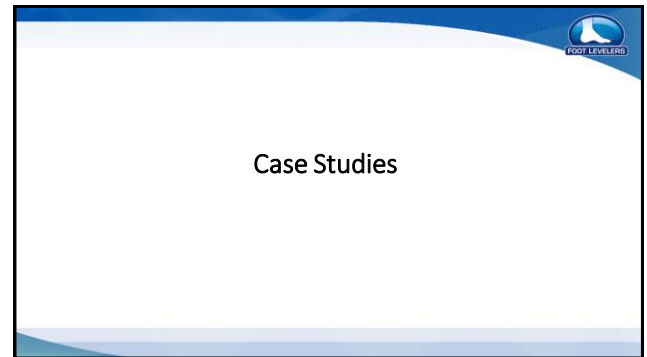
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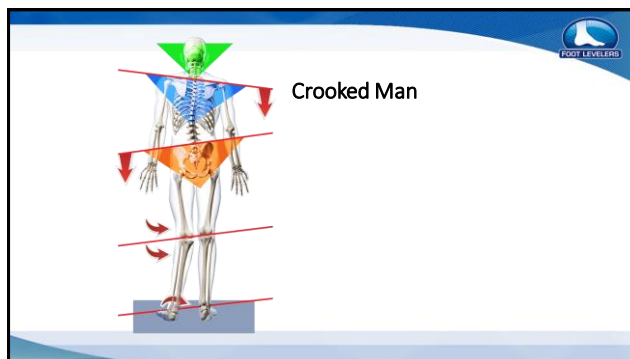
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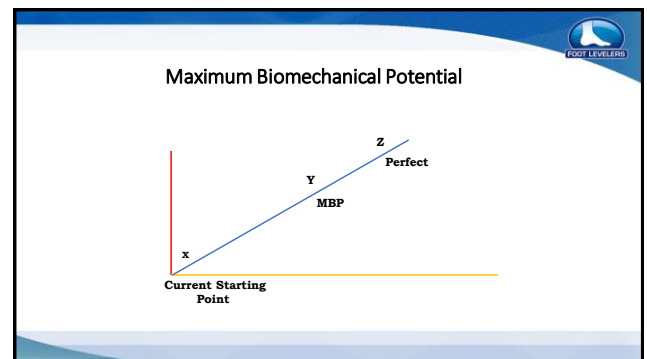
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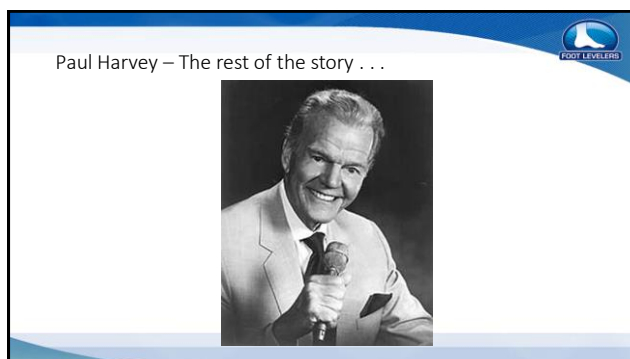
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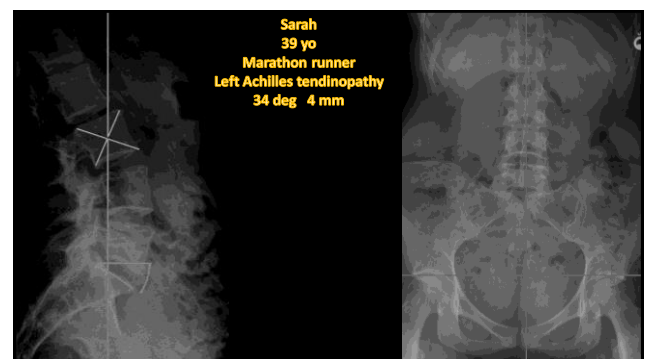
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- What additional treatment options do you utilize in your practice?
- Therapeutic modalities
- Physical therapy
- Nutrition
- Therapeutic exercise
- Orthotics
- Taping
- Soft tissue techniques

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An evidence-based diagnostic classification system for low back pain

Robert Vining, DC^{*}
Eric Potocki, DC, MS^{**}
Michael Seidman, MSW, DC[†]
A. Paige Morgenthal, DC, MS^{††}

Vining R, Potocki E, Seidman M, Morgenthal AP. An evidence-based diagnostic classification system for low back pain. *J Can Chiropr Assoc.* 2013;57(3):189-204.

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Current Evidence for Diagnosis of Common Conditions Causing Low Back Pain: Systematic Review and Standardized Terminology Recommendations

Robert D. Vining, DC, DHSc, Zacariah K. Shannon, DC, MS, Amy L. Minkalis, DC, MS, and Elissa J. Twist, DC, MS



Development of an Evidence-Based Practical Diagnostic Checklist and Corresponding Clinical Exam for Low Back Pain

Robert D. Vining, DC, DHSc, Amy L. Minkalis, DC, MS, Zacariah K. Shannon, DC, MS, and Elissa J. Twist, DC, MS

Development of a Clinical Decision Aid for Chiropractic Management of Common Conditions Causing Low Back Pain in Veterans: Results of a Consensus Process

Robert D. Vining, DC, DHSc, Zacariah K. Shannon, DC, MS, Stacie A. Salisbury, PhD, RN, Lance Corber, PhD, Amy L. Minkalis, DC, MS, and Christine M. Goertz, DC, PhD

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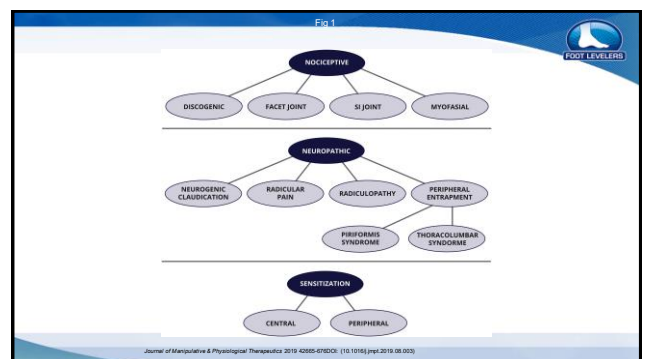



Development of an Evidence-Based Practical Diagnostic Checklist and Corresponding Clinical Exam for Low Back Pain

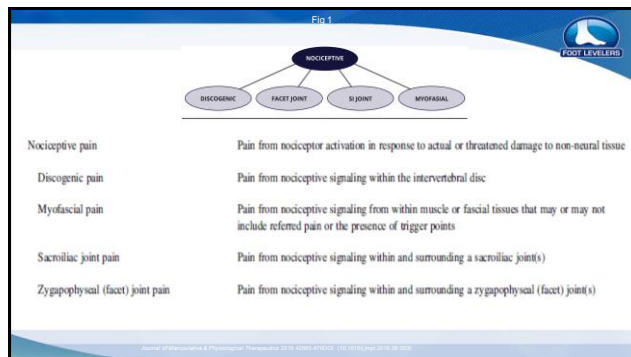
Robert D. Vining, DC, DHSc, Amy L. Minkalis, DC, MS, Zacariah K. Shannon, DC, MS, and Elissa J. Twist, DC, MS

Vining RD, Minkalis AL, Shannon ZK, Twist EJ. Development of an evidence-based practical diagnostic checklist and corresponding clinical exam for low back pain. *J Manipulative Physiol Ther.* 2019;42(9):665-676.

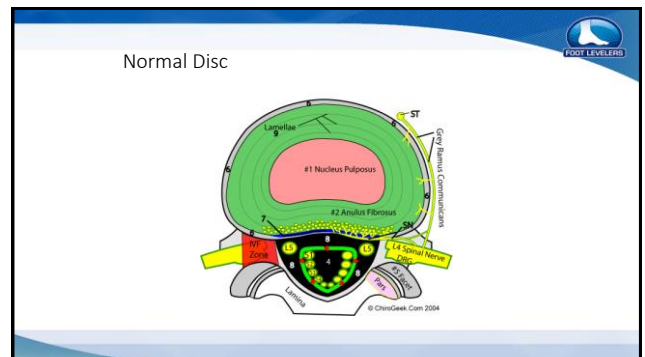
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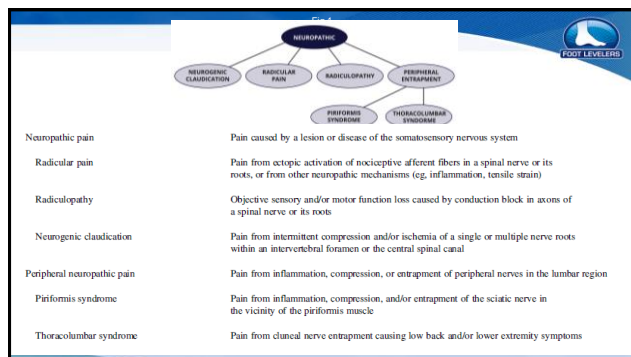
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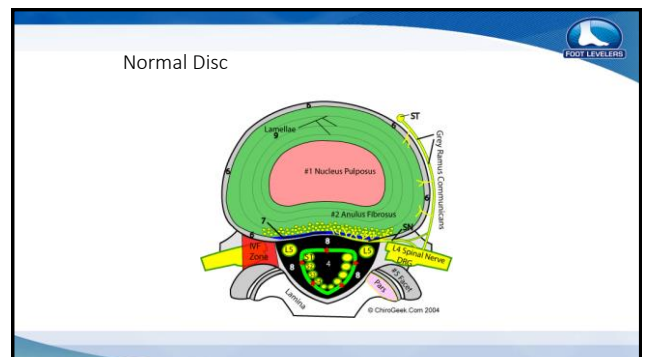
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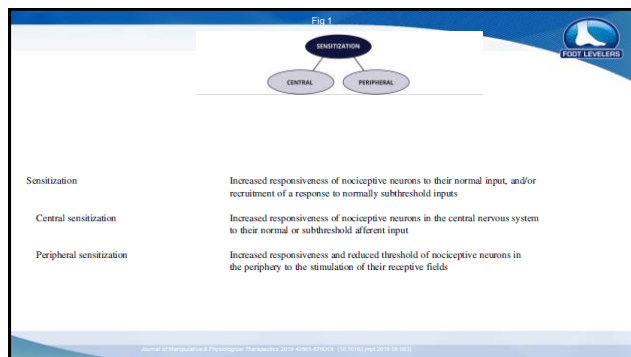
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Therapeutic Pain

Correlation with repeated history in any 1 or more of the following (1-5, 6-9, 10):

1. Duration: ☐ Yes ☐ No

2. Location: ☐ Yes ☐ No

3. Quality: ☐ Yes ☐ No

4. Timing: ☐ Yes ☐ No

5. Provocation: ☐ Yes ☐ No

6. Radiation: ☐ Yes ☐ No

7. Reproduction of familiar pain with palpation or use: ☐ Yes ☐ No

8. Reproduction of familiar pain with palpation or use: ☐ Yes ☐ No

9. Reproduction of familiar pain with palpation or use: ☐ Yes ☐ No

10. Reproduction of familiar pain with palpation or use: ☐ Yes ☐ No

Neurologic Joint Pain (3 or more of 10 tests)

1. 1 or more positive (3) joint tests with characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

2. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

3. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

4. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

5. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

6. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

7. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

8. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

9. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

10. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

11. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

12. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

13. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

14. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

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247. Characteristic? (1-5, 6-9, 10): ☐ Yes ☐ No

248. Characteristic? (1-5, 6-

Seated examination

Deep Tendon Reflexes ☐ NCI

	Left	Right
(L2-4) Patellar	(0-5)	(0-5)
(S1,2) Achilles	(0-5)	(0-5)
Other	(0-5)	(0-5)

Motor strength ☐ NCI


	Left	Right
(L4-S1) Tibialis Anterior		
(L4, L5, S1) Extensor Hallucis Longus		
(L4-S1) Peroneus Longus		
Other		

SITTING

Minors - +
 SSLR - + R L
 LER 1+ 2+ 3+
 LE Strength 5+ 4+ 3+
 UER 1+ 2+ 3+
 UE Strength 5+ 4+ 3+
 CS Compression - + L R B
 CS Distraction - + L R B
 CS Max Foraminal Comp - + L R B

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Foot Eversion – Peronius longus
L5- S1



338

Foot Dorsiflexion – Extensor Hallicus Longus
L5



339

Foot Inversion – Tibialis anterior
L4-5



340

Seated examination

Deep Tendon Reflexes ☐ NCI

	Left	Right
(L2-4) Patellar	(0-5)	(0-5)
(S1,2) Achilles	(0-5)	(0-5)
Other	(0-5)	(0-5)

Motor strength ☐ NCI

	Left	Right
(L4-S1) Tibialis Anterior		
(L4, L5, S1) Extensor Hallucis Longus		
(L4-S1) Peroneus Longus		
Other		

SITTING

Minors - +
 SSLR - + R L
 LER 1+ 2+ 3+
 LE Strength 5+ 4+ 3+
 UER 1+ 2+ 3+
 UE Strength 5+ 4+ 3+
 CS Compression - + L R B
 CS Distraction - + L R B
 CS Max Foraminal Comp - + L R B

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Supine examination

1. Straight leg raise test (Piriformis syndrome, Radiculopathy, Radicular pain) ☐ Pos ☐ Neg ☐ NCI
 2. Centralization with supine flexion repeated end range loading (Discogenic pain) ☐ Pos ☐ Neg ☐ NCI
 3. Gaenslen's Left (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI
 4. Gaenslen's Right (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI
 5. Thigh Thrust (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI
 6. Distraction (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI
 7. Patrick's (optional or sacral thrust) (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI

SUPINE

Gaenslen's R L B
 SLR N + R L ≠
 Braggard's N + R L
 Thigh Thrust R L B
 Hip Flex N + R L ≠
 FAbEr N + R L ≠
 SI Distraction N + R L
 Int Hip Rot N ↓ R L

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Side-lying examination

1. Iliac Compression (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI

Prone examination

1. Centralization with prone extension end range loading (Discogenic pain) ☐ Yes ☐ No ☐ NCI

2. Trigger point over iliac crest approximately 7 cm from midline (thoracolumbar syndrome) ☐ Yes ☐ No ☐ NCI

3. Sensitivity to iliac crest skin rolling (thoracolumbar syndrome) ☐ Yes ☐ No ☐ NCI

4. Tenderness of thoracolumbar spinous processes or facet joints (thoracolumbar syndrome) ☐ Yes ☐ No ☐ NCI

5. Sacral Thrust (Sacroiliac joint pain) ☐ Pos ☐ Neg ☐ NCI

PRONE

CS Tenderness	+ + +	Facet compression	L5 L4 L3 L2 L1
CS Hypertonicity	+ + +	Skin rolling iliac crest	L R
LS Tenderness	+ + +	TP Quad Lum	L R
LS Hypertonicity	+ + +	TP Glut Med	L R
Nachlas	N + L R	TP Piriformis	L R
Ycoman	N + L R	TP Subocc	L R
SI compression	N + L R	TP Traps	L R
		TP Deltoid	L R

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Symptom dependent examination position

1. Hypoesthesia to touch in the painful area (nociceptive vs neuropathic pain) ☐ Yes ☐ No ☐ NCI

2. Hypoesthesia to pinprick in the painful area (nociceptive vs neuropathic pain) ☐ Yes ☐ No ☐ NCI

3. Pain increased or caused by brushing painful area (nociceptive vs neuropathic pain) ☐ Yes ☐ No ☐ NCI

4. Dermatomal hypoesthesia/anesthesia (radiculopathy) ☐ Yes ☐ No ☐ NCI

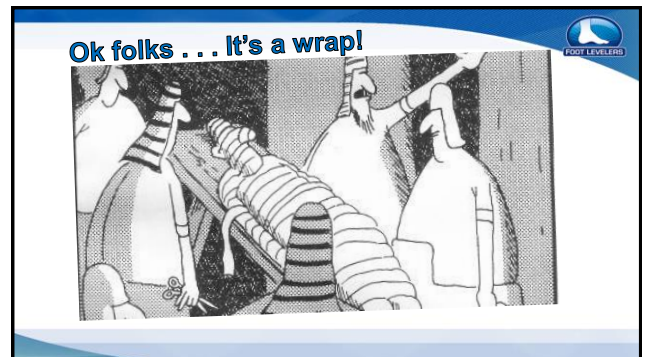
344

Development of an Evidence-Based Practical Diagnostic Checklist and Corresponding Clinical Exam for Low Back Pain

Robert D. Vining, DC, DHSc, Amy L. Minkalis, DC, MS, Zacariah K. Shannon, DC, MS, and Elissa J. Twist, DC, MS

Vining RD, Minkalis AL, Shannon ZK, Twist EJ. Development of an evidence-based practical diagnostic checklist and corresponding clinical exam for low back pain. J Manipulative Physiol Ther. 2019;42(9):665-676.

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