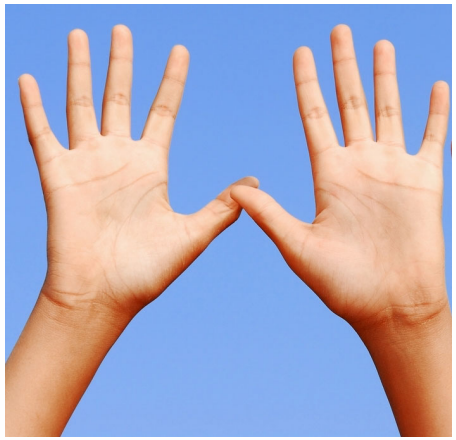
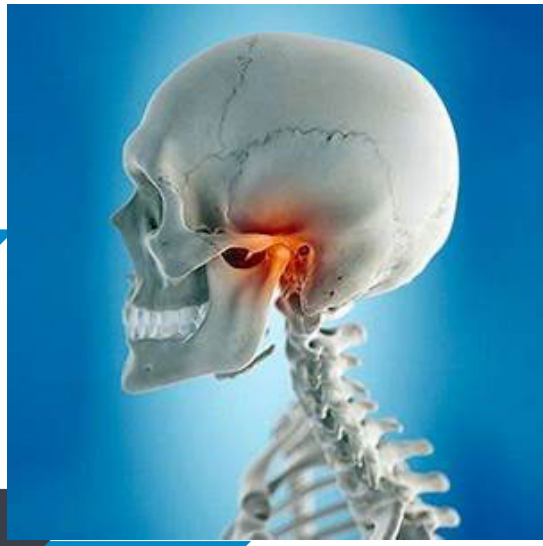




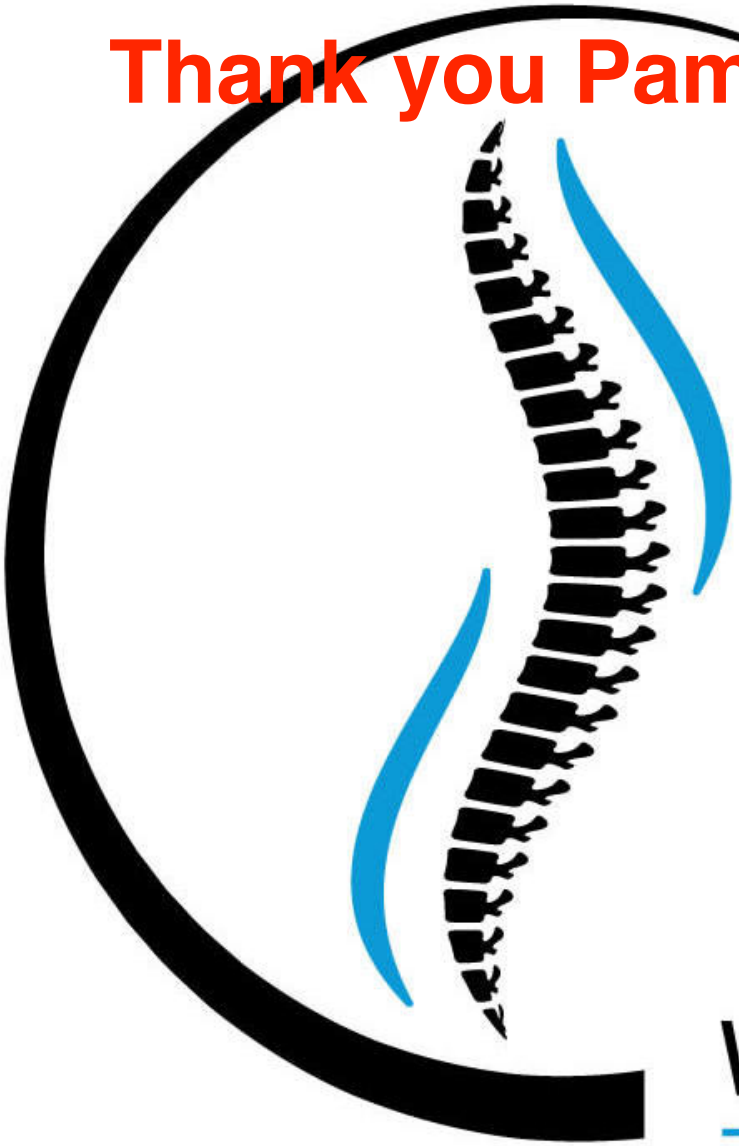
FOOT LEVELERS

Mastering the Extremities and Spine “The Wong” Way

FOOT LEVELERS

Extremity and spinal stuff that you can actually use in daily practice.

Thank you Pam Grove, Julie Connolly and…



UNIFIED

VCA

VIRGINIA CHIROPRACTIC ASSOCIATION

Established 1925

(teaching since 2004)

PALMER
College of Chiropractic
West - 1996

MEMBER OF THE
CALIFORNIA CHIROPRACTIC ASSOCIATION
CAL CHIRO

ROCKTAPE DOC™

FMT CERTIFIED
rocktape - fascial movement taping


Dr. Kevin Wong
The Extremity
Doctor

FOOT LEVELERS

Foot Levelers Rep:

Misty Whorley

Foot Levelers Territory Manager

FOOT LEVELERS

THOSE WHO CAN, TEACH!

(Since 1997)

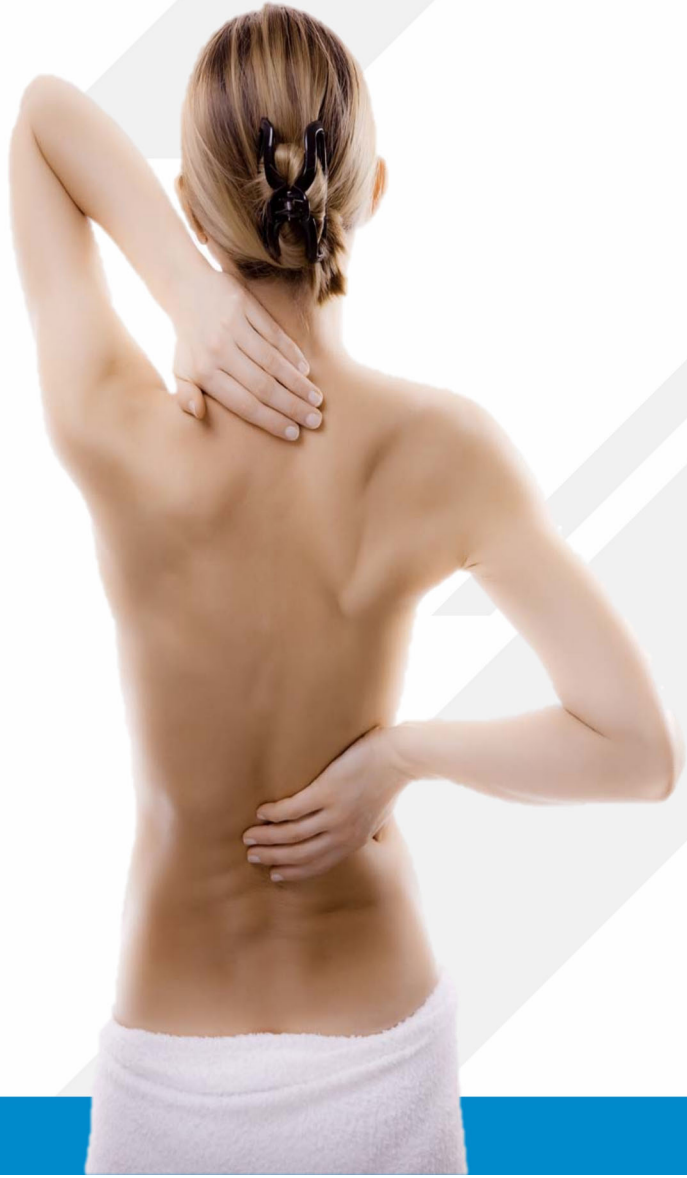
KEVIN'S GOALS:

- Set you apart from other health care providers by teaching you how to evaluate/treat the feet, arches of all your patients.
- Illustrate how the extremities can affect the axial spine.
- Make you a shoulder, rib expert (many are not)
- Introduce/review adjustments for the spine, extremities.

FOOT LEVELERS

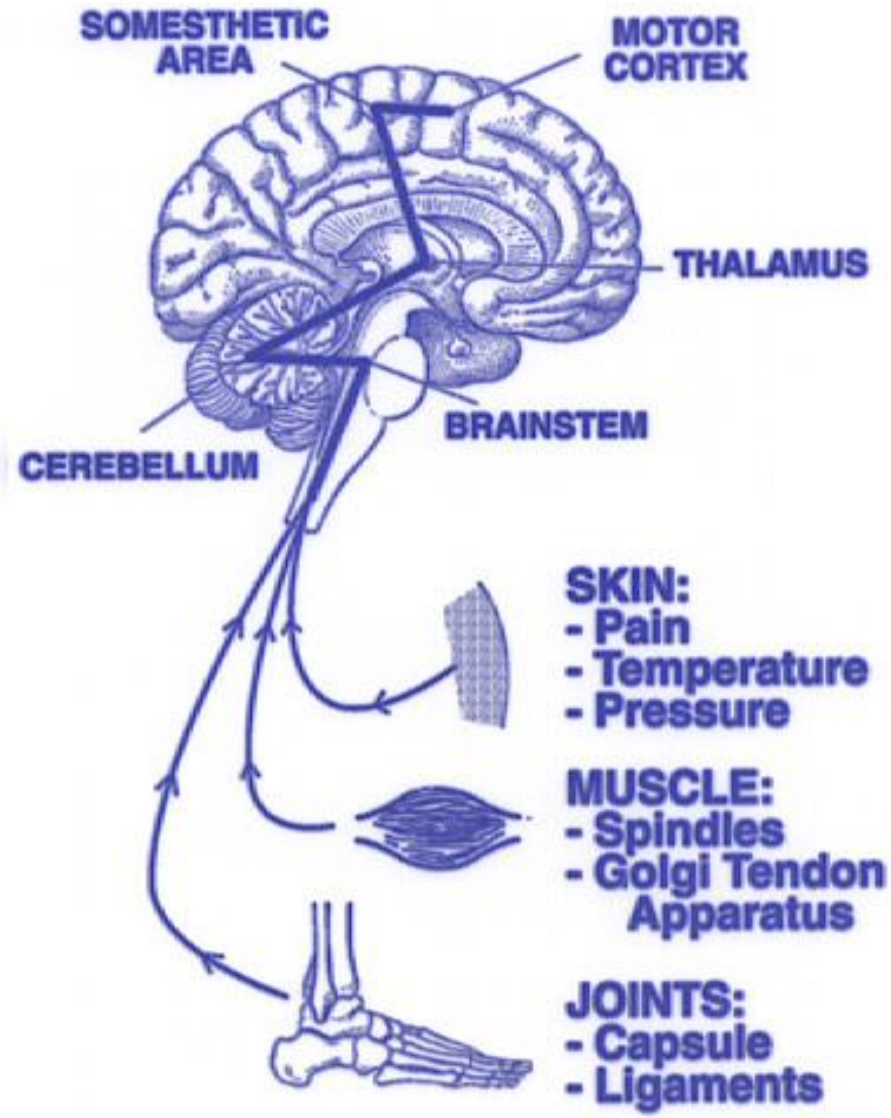
“The Public’s perception of Chiropractic is most often related to back and neck pain”

WFC Assembly, Sidney, Australia June 15, 2005

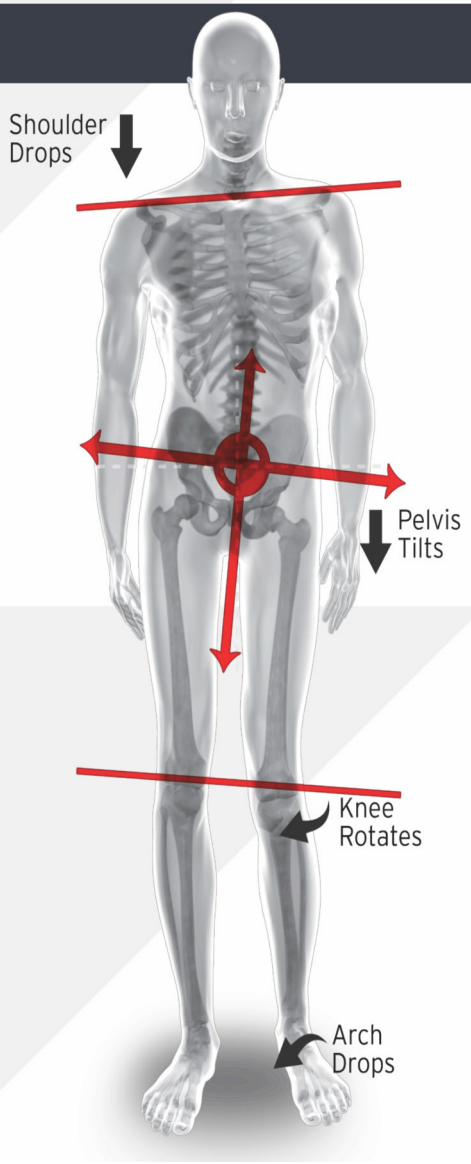


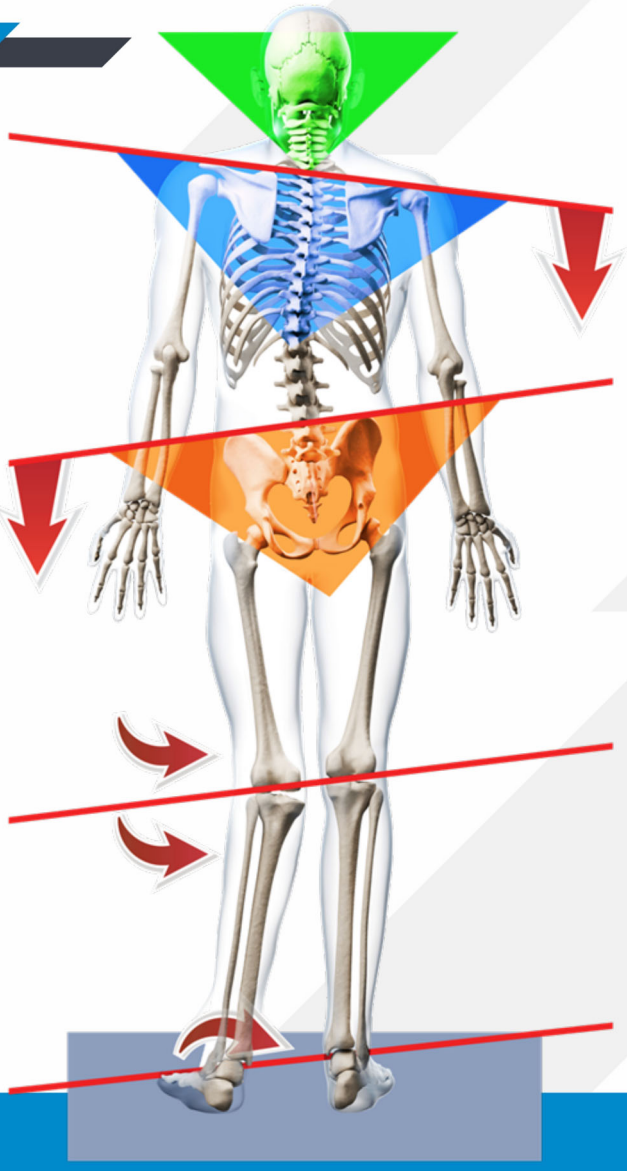
FOOT LEVELERS

Structural stress produces muscle imbalances



FOOT LEVELERS





FOOT LEVELERS

WHAT CHIRO SCHOOL TEACHES

Spine = 90%

Extremities = ???

Are you adjusting extremities proficiently?

The Riches Are in the Niches

Structure – Function Model of Chiropractic

Adjust

↓

Restore NS Integrity

↓

Optimize Sensory Motor Reflexes

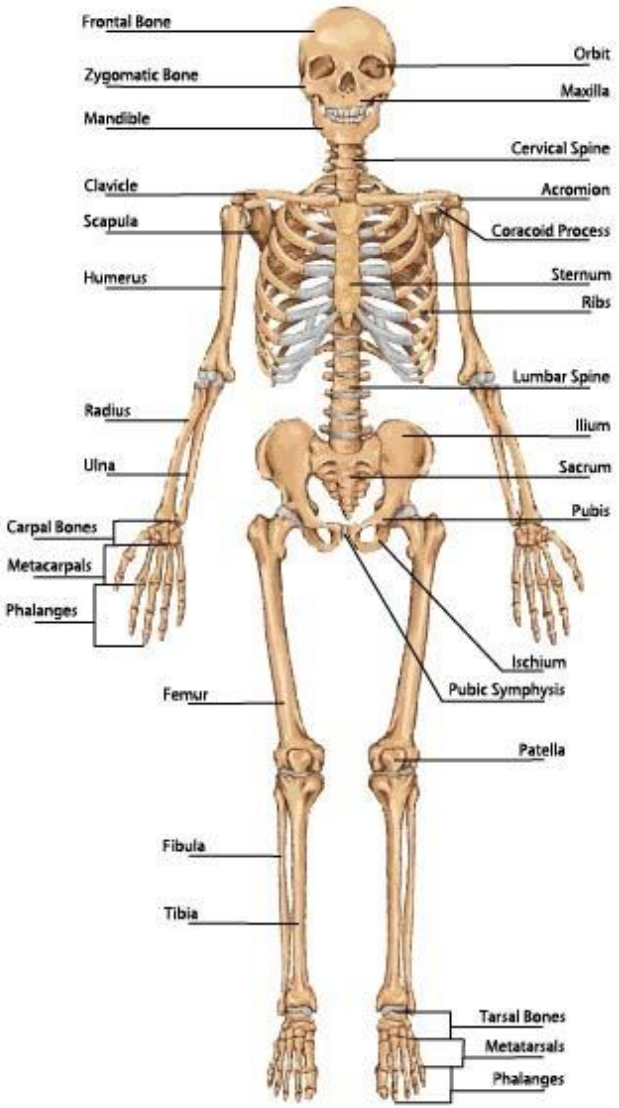
↓

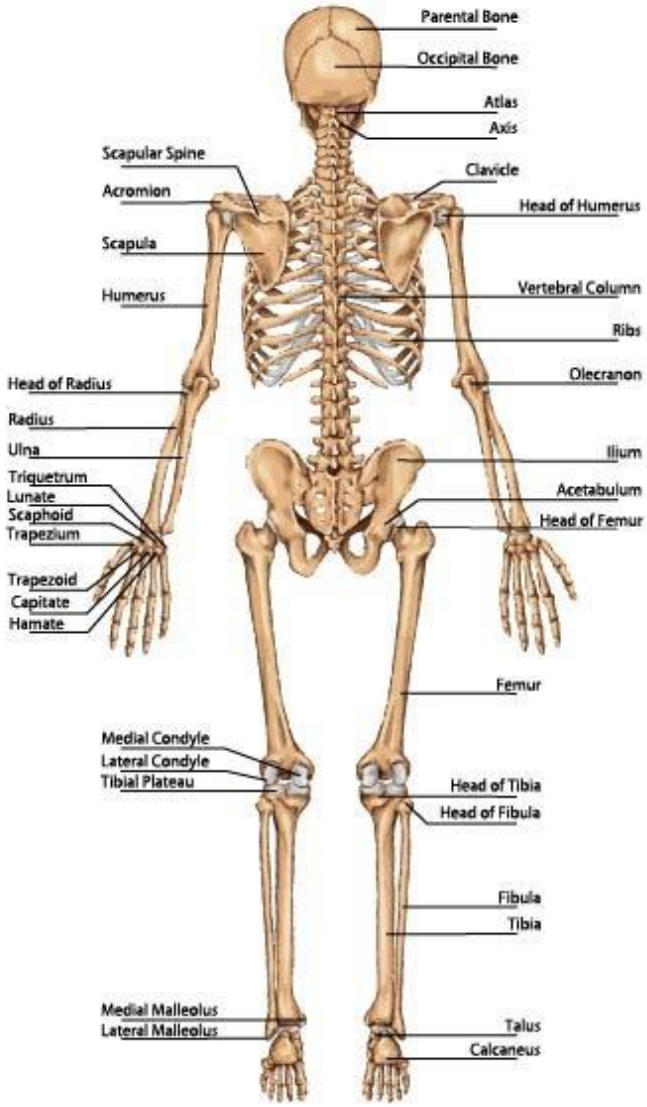
Restore Structural Alignment*

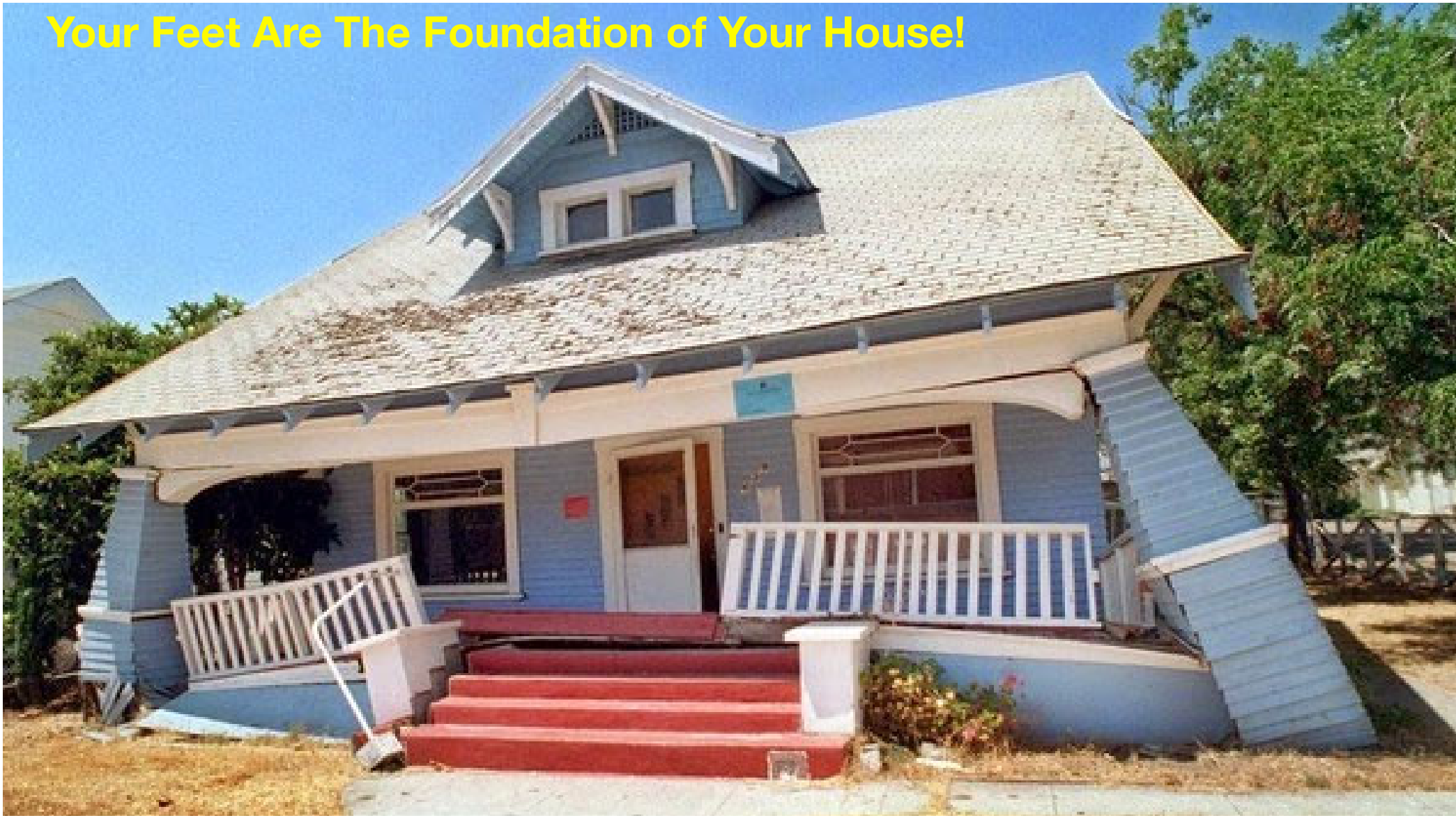
→ *(*restoring is one thing, maintaining is another)*

Game Plan

- Foot/Ankle
- Knee
- Hip
- Pelvis
- T/L-Spine
- Shoulders
- TMJ






Your Feet Are The Foundation of Your House!

Your Foundation

When the foundation of your home is not level, the walls will start cracking and crumbling.

The crumbling can create problems on your top floor.

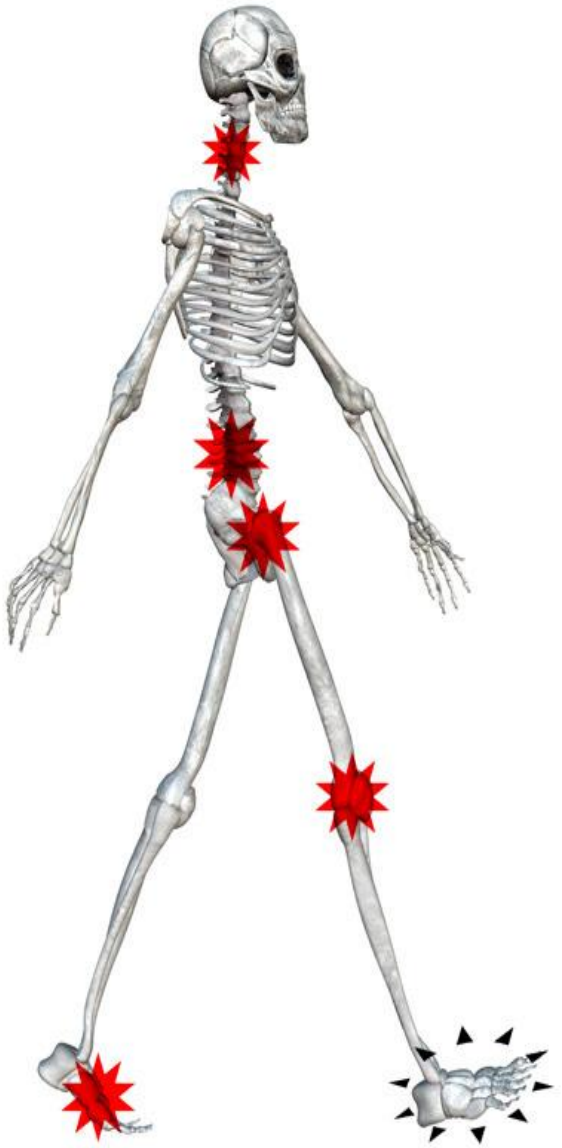
It's the same with your body!

FOOT LEVELERS

Start with your foundation

FOOT LEVELERS

Every biomechanical imbalance is transmitted to the spine



Different surfaces effect forces on the LE and body.

FOOT LEVELERS

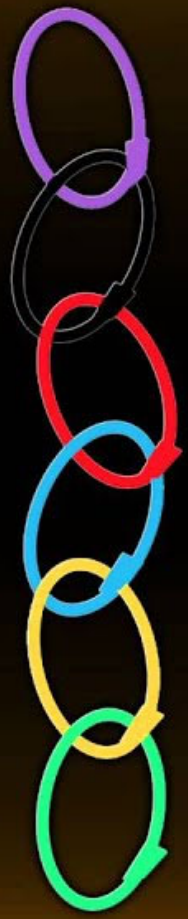
LE has significant relationship to the body & clinical conditions in practice.

The Big Idea

The body is a fluid, kinetic chain of events…

It is **NOT** static!

Kinetic Chain



Cervical Spine

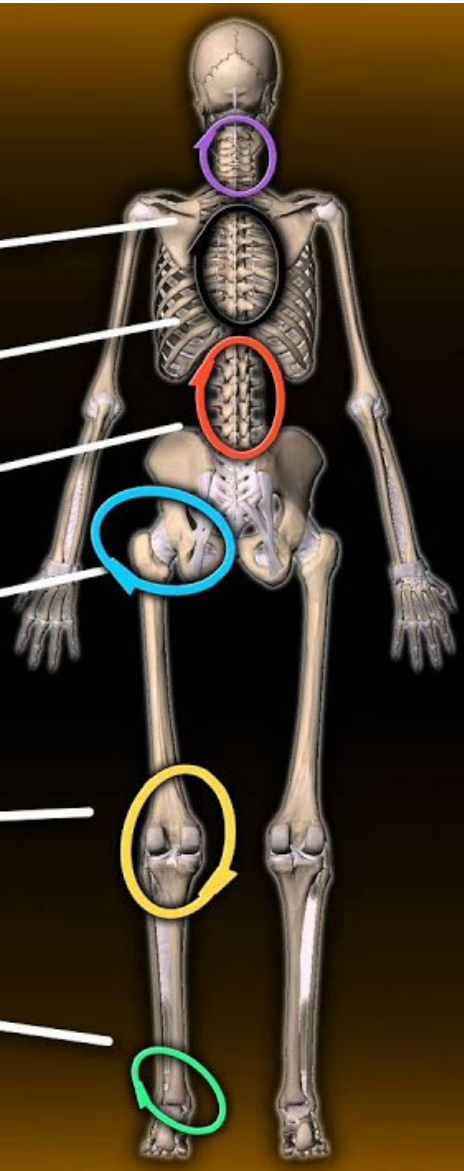
Thoracic Spine

Lumbar Spine

Hip Joints

Knee Joints

Ankle Joints



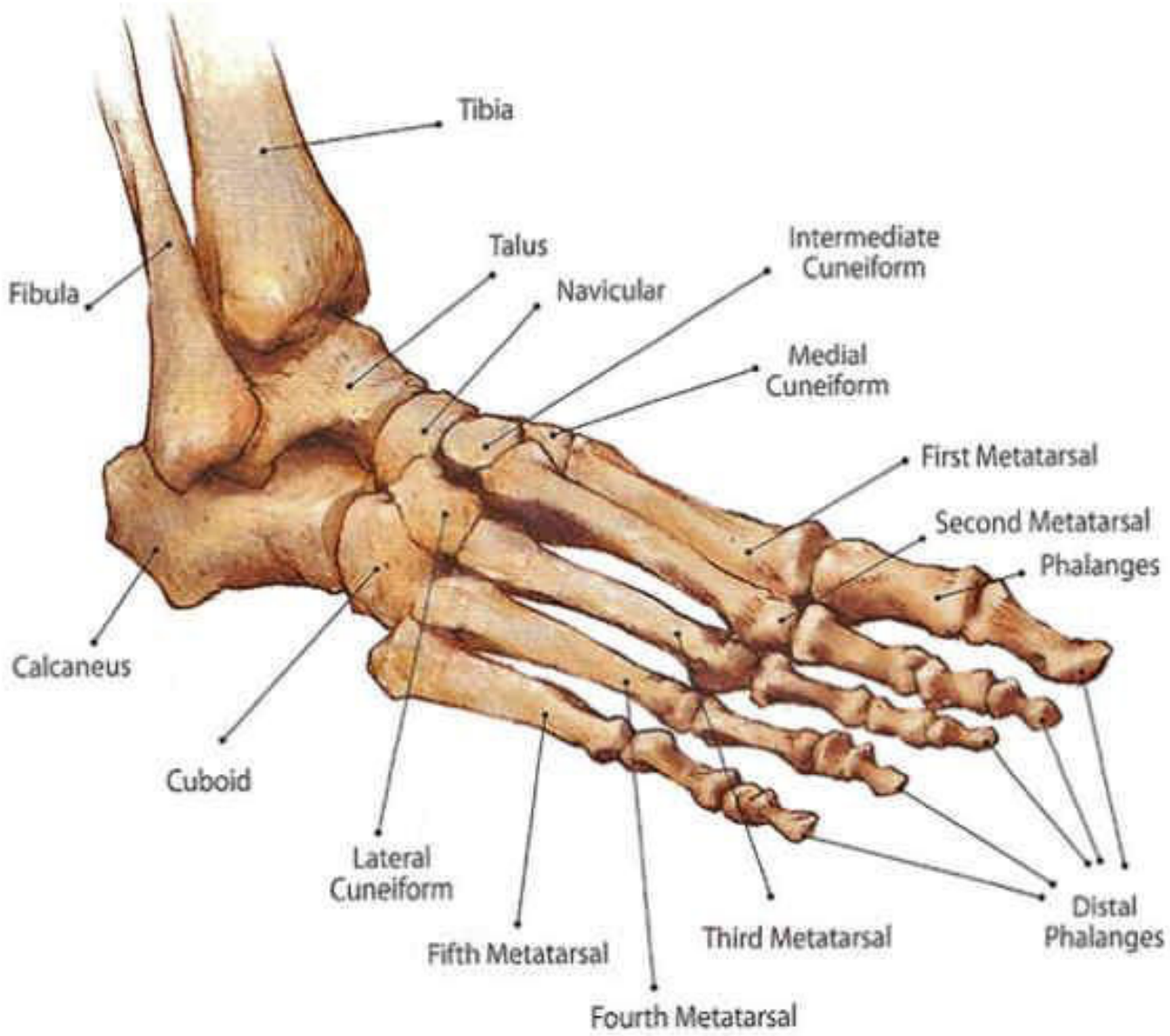
The entire body is supported **by the feet**

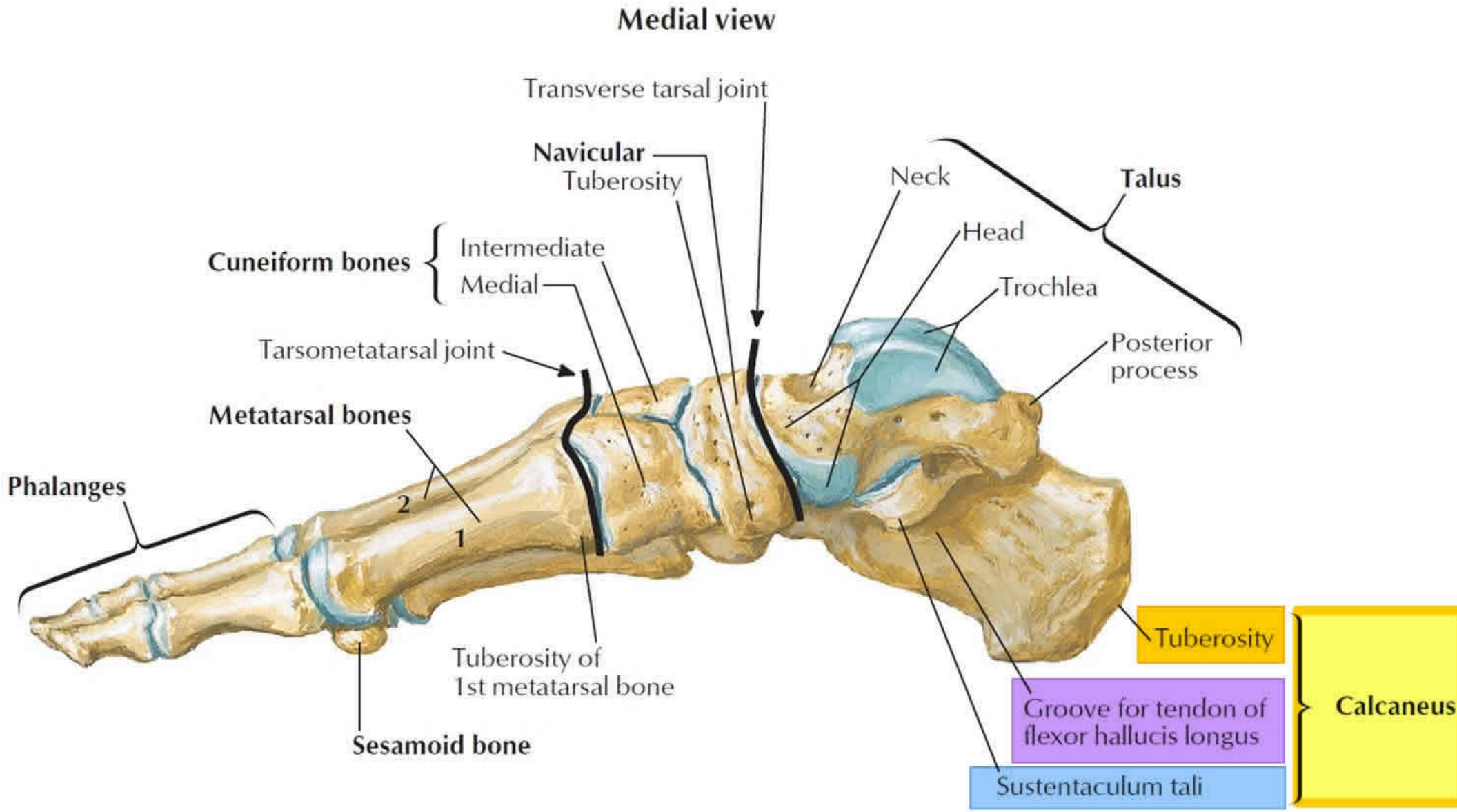
FOOT LEVELERS


LOSE
THE
SHOES

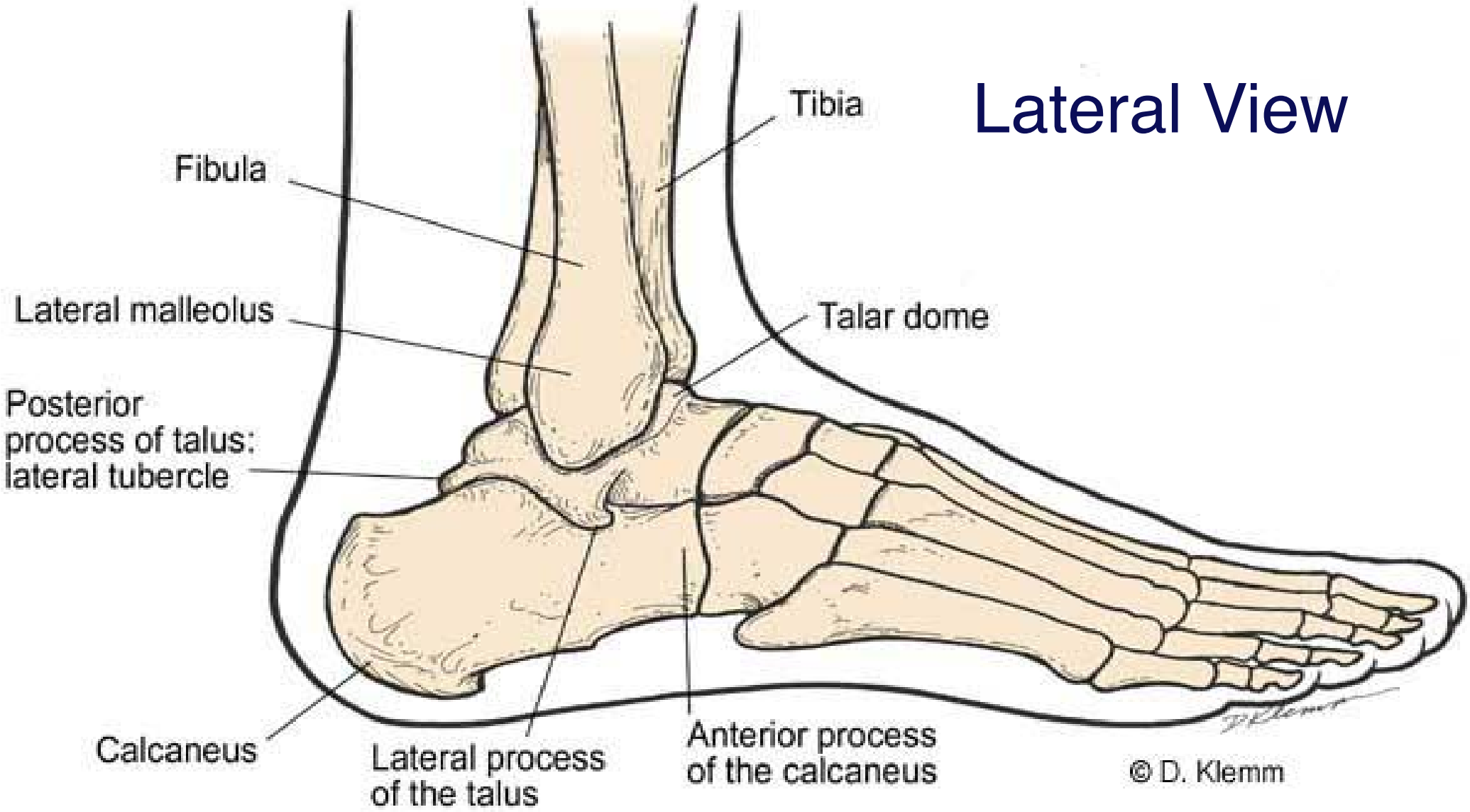
FOOT LEVELERS

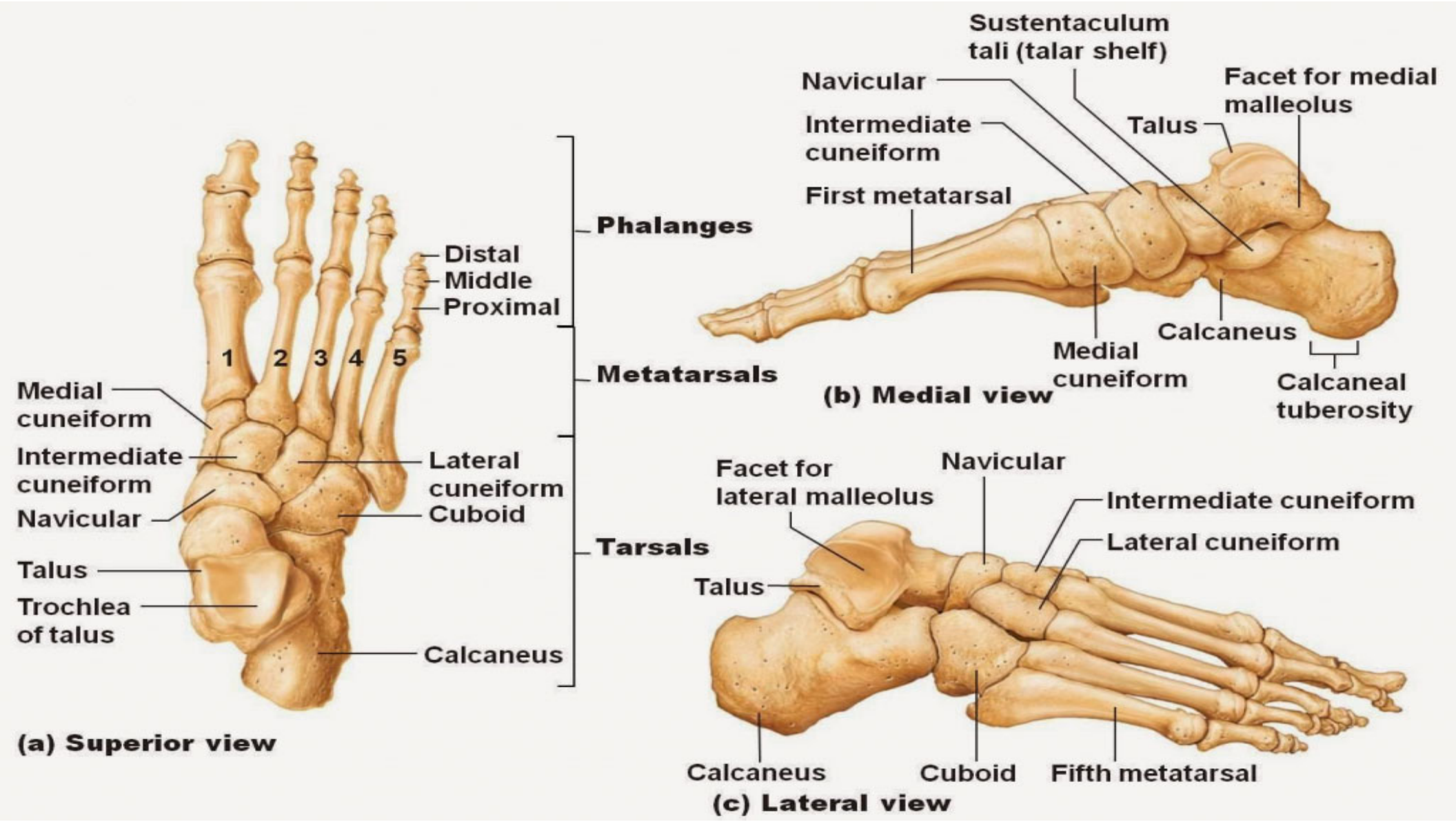
How many bones are in each foot?

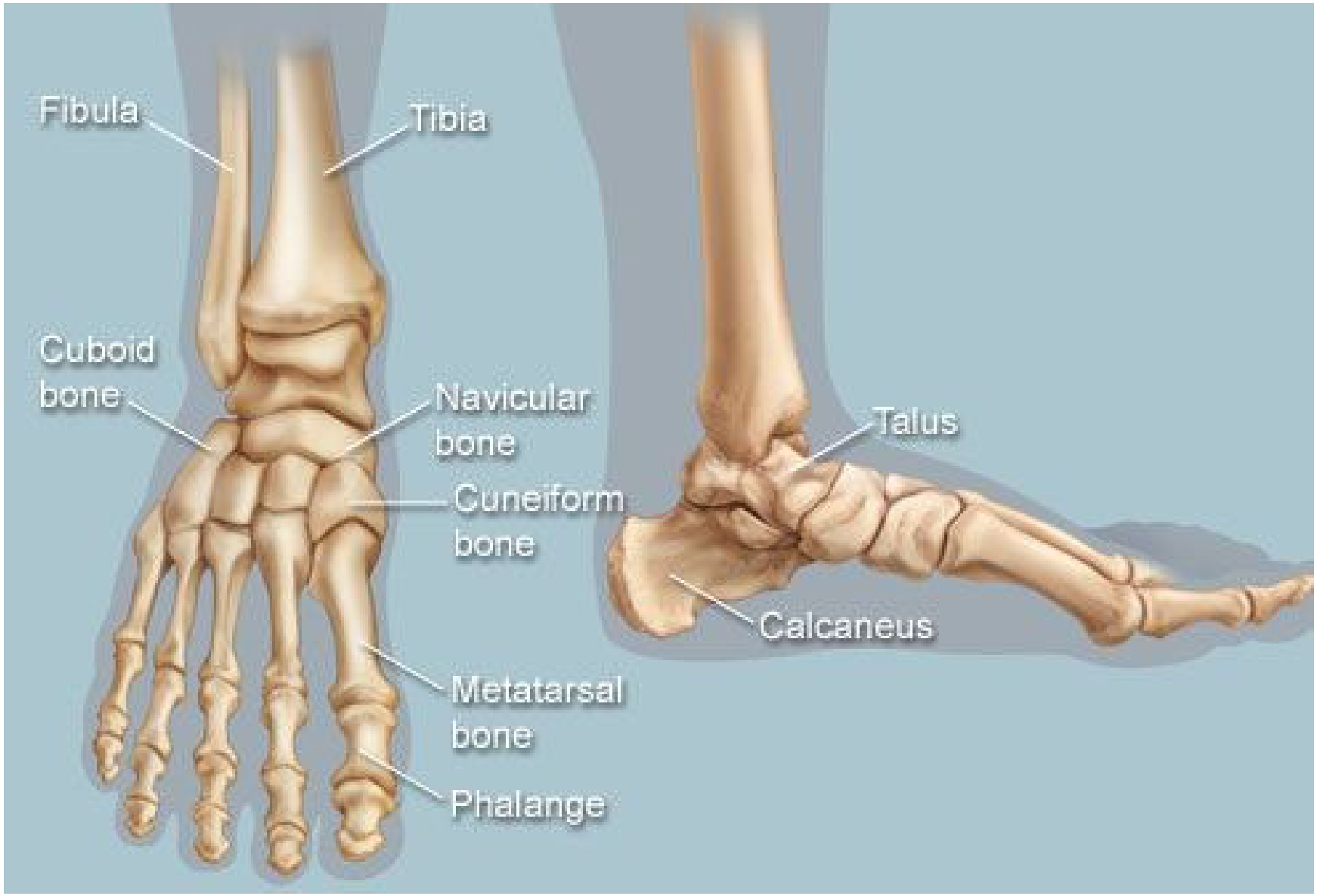


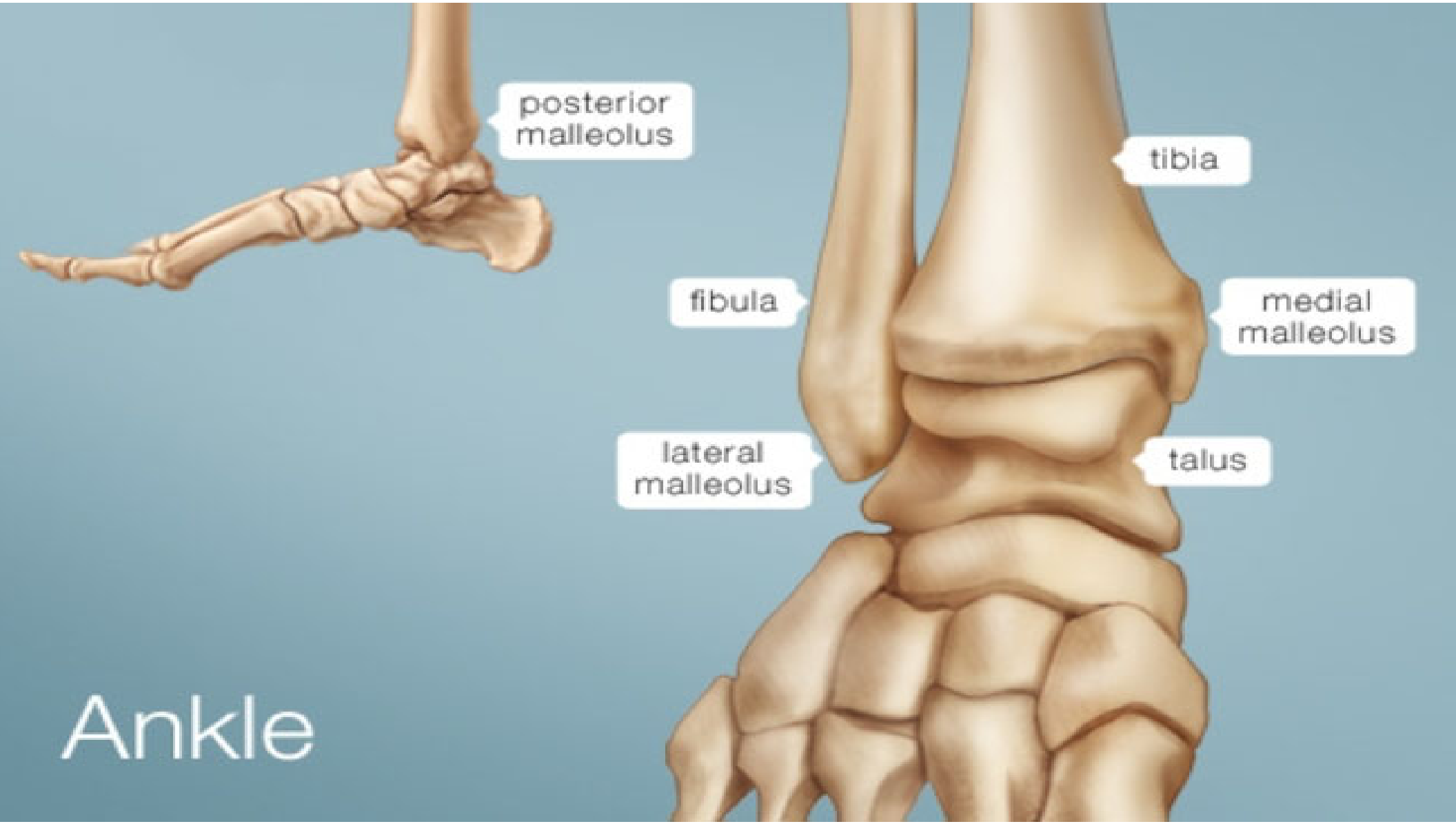

Medial view
Transverse tarsal joint
Navicular
Tuberosity
Neck
Talus
Head
Cuneiform bones
Intermediate
Medial
Trochlea
Tarsometatarsal joint
Posterior process
Metatarsal bones
Phalanges
2
1
Tuberosity
Tuberosity of 1st metatarsal bone
Groove for tendon of flexor hallucis longus
Calcaneus
Sesamoid bone
Sustentaculum tali

Lateral View




Phalanges
Metatarsals
Tarsals
Distal
Middle
Proximal
1
2
3
4
5
Medial cuneiform
Intermediate cuneiform
Navicular
Talus
Trochlea of talus
Lateral cuneiform
Cuboid
Calcaneus
(a) Superior view
Sustentaculum tali (talar shelf)
Navicular
Intermediate cuneiform
First metatarsal
Talus
Facet for medial malleolus
Calcaneus
Medial cuneiform
Calcaneal tuberosity
(b) Medial view
Facet for lateral malleolus
Navicular
Intermediate cuneiform
Lateral cuneiform
Talus
Calcaneus
Cuboid
Fifth metatarsal
(c) Lateral view


Fibula
Tibia
Cuboid bone
Navicular bone
Cuneiform bone
Talus
Calcaneus
Metatarsal bone
Phalange


posterior malleolus
tibia
fibula
medial malleolus
lateral malleolus
talus
Ankle

Palpate the Feet

- Calcaneus (heel)
- Talus (dome, just under the tibia)
- Navicular (tubercle) inside foot
- Cuboid (proximal to styloid process of MT5)
- Cuneiforms (medial, intermediate, lateral)
- Metatarsals 1- 5
- Phalanges 1- 5 (3 parts, except big toe)

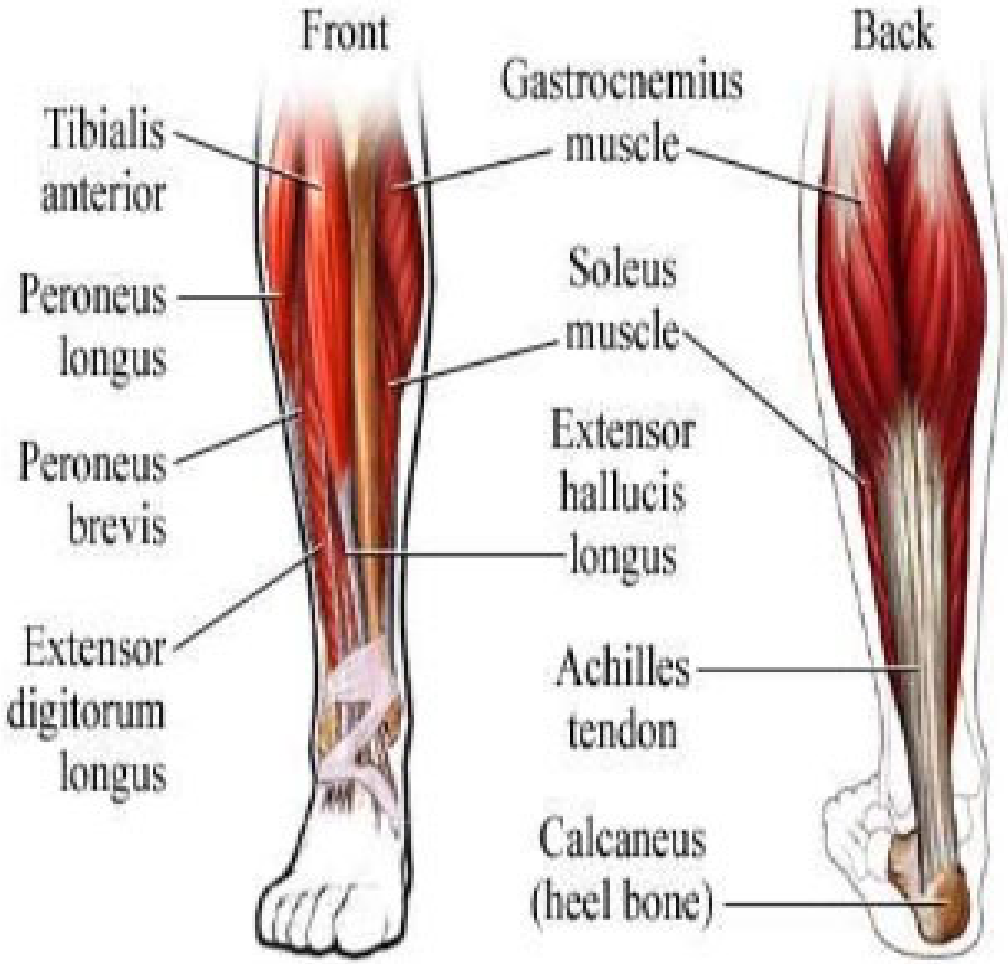
Joint Movements

Inversion and Eversion of the foot at the ankle

Dorsiflexion and Plantar flexion of the foot at the ankle

ANKLE & FOOT JOINT- MUSCLES INVOLVED

- Dorsi flexion :- Tibialis , Extensor Digitorum longus.
- Planter Flexion:- Gastrocnemius or soleus.
- Inversion:- Tibialis Anterior.
- Eversion:- extensor Digitorum



FOOT LEVELERS

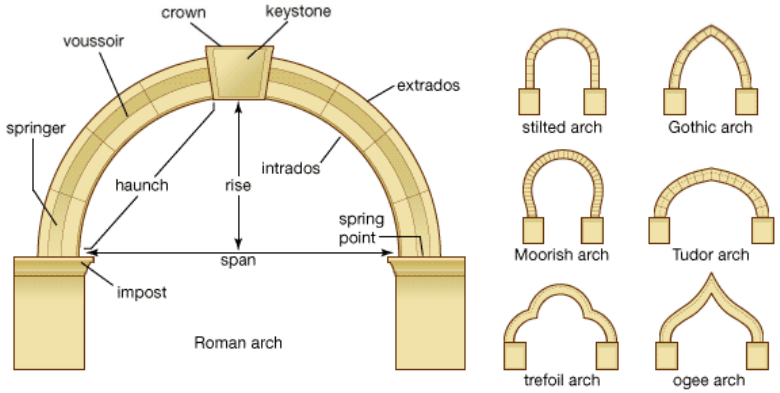
How many arches under each foot?

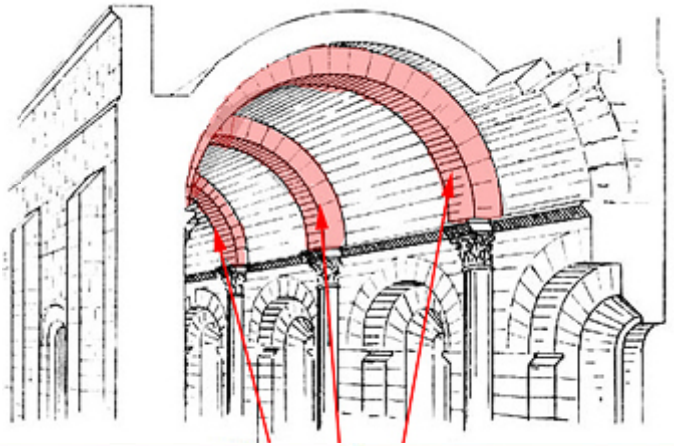
How many arches do patients think we have?

THE ARCHES

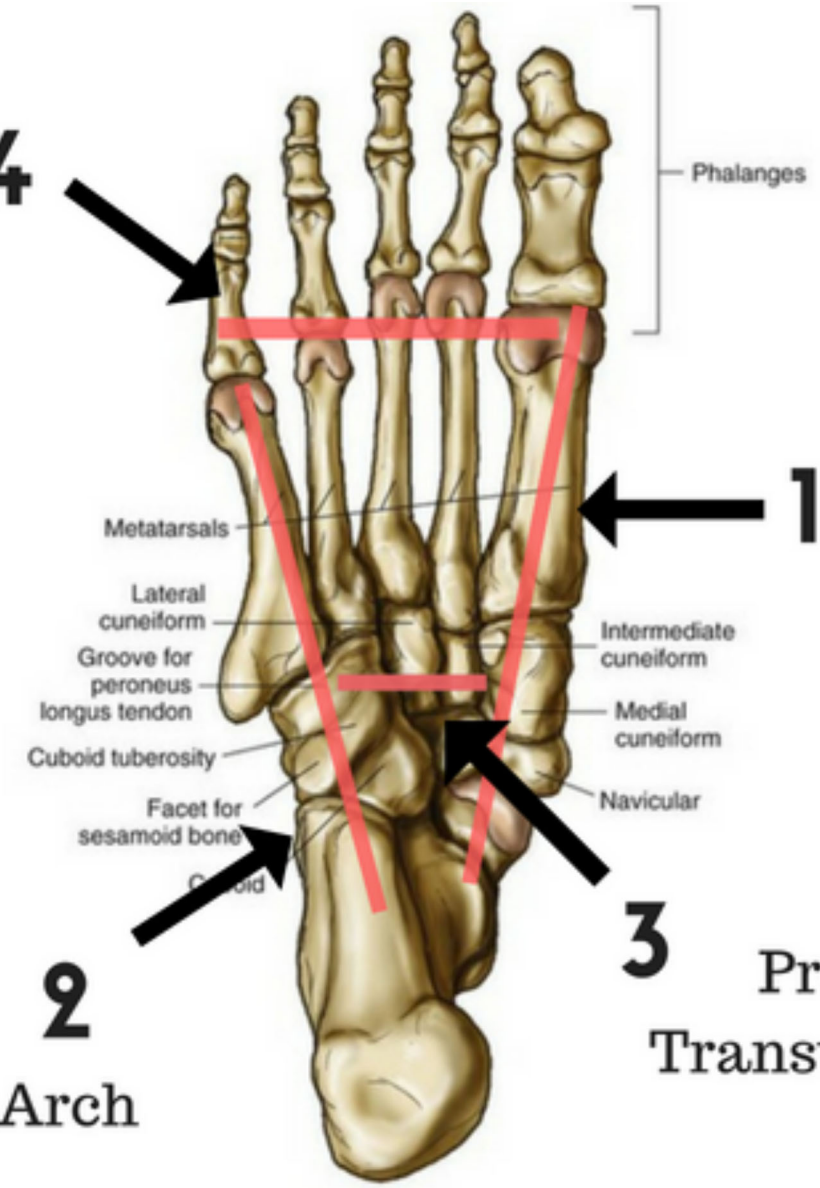
- Plantar vault
- Not present at birth

Arch Architecture





Pont du Gard (500 CE)



Distal Transverse Arch 4

1 Medial Longitudinal Arch

2 Lateral Longitudinal Arch

3 Proximal Transverse Arch

Arches of Foot

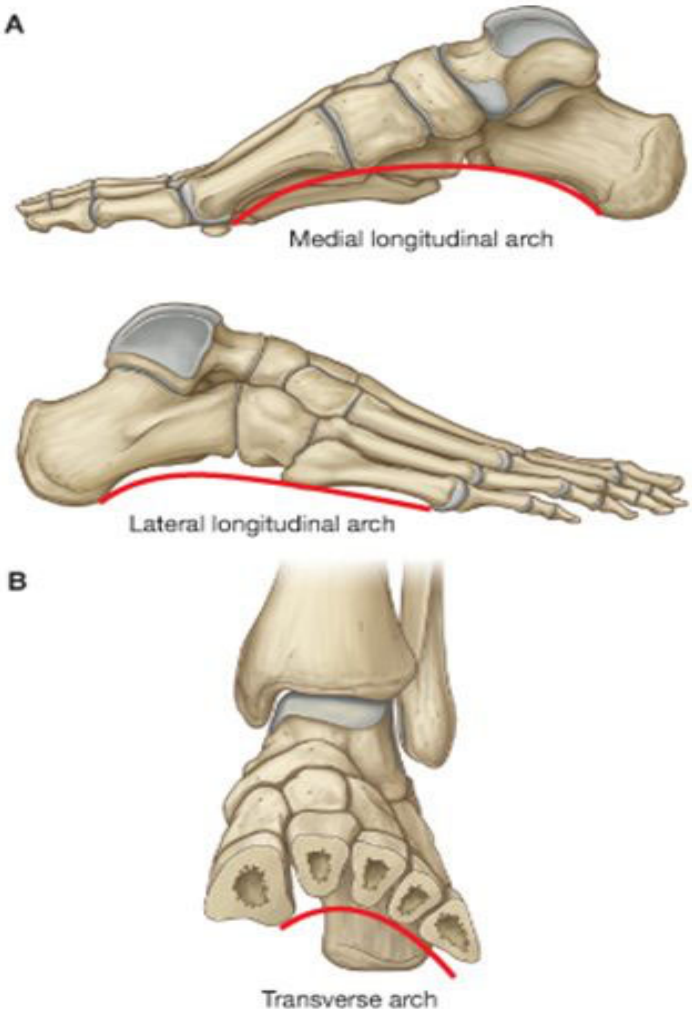
- **Medial longitudinal arch**

- Is formed of calcaneum, talus, navicular, 3 cuneiform bones, and first medial 3 metatarsal bones.

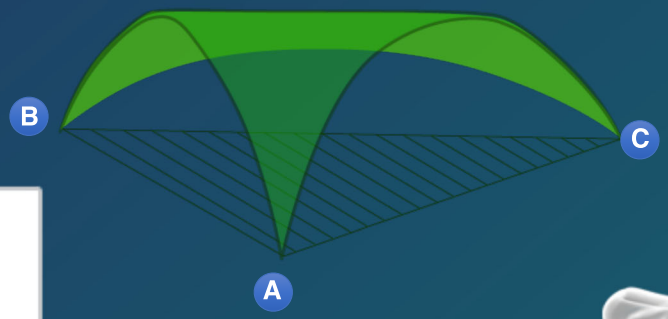
- **Lateral longitudinal arch** Is formed of calcaneum, cuboid & lateral 4th & 5th metatarsal bones

- **Transverse arch**

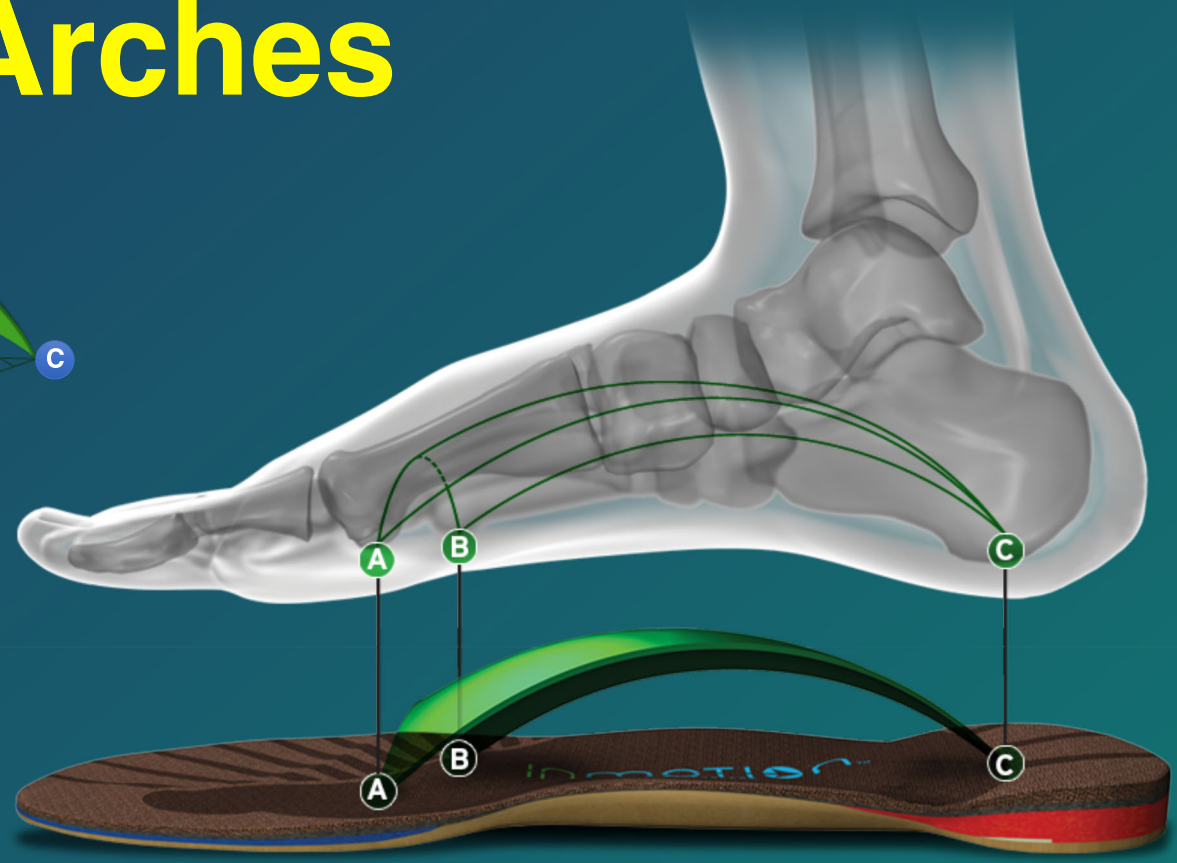
- Lies at the level of tarso-metatarsal joints, formed of bases of metatarsal bones, cuboid & 3 cuneiform bones.



3 Arches



PLANTAR VIEW



Plantar Vault

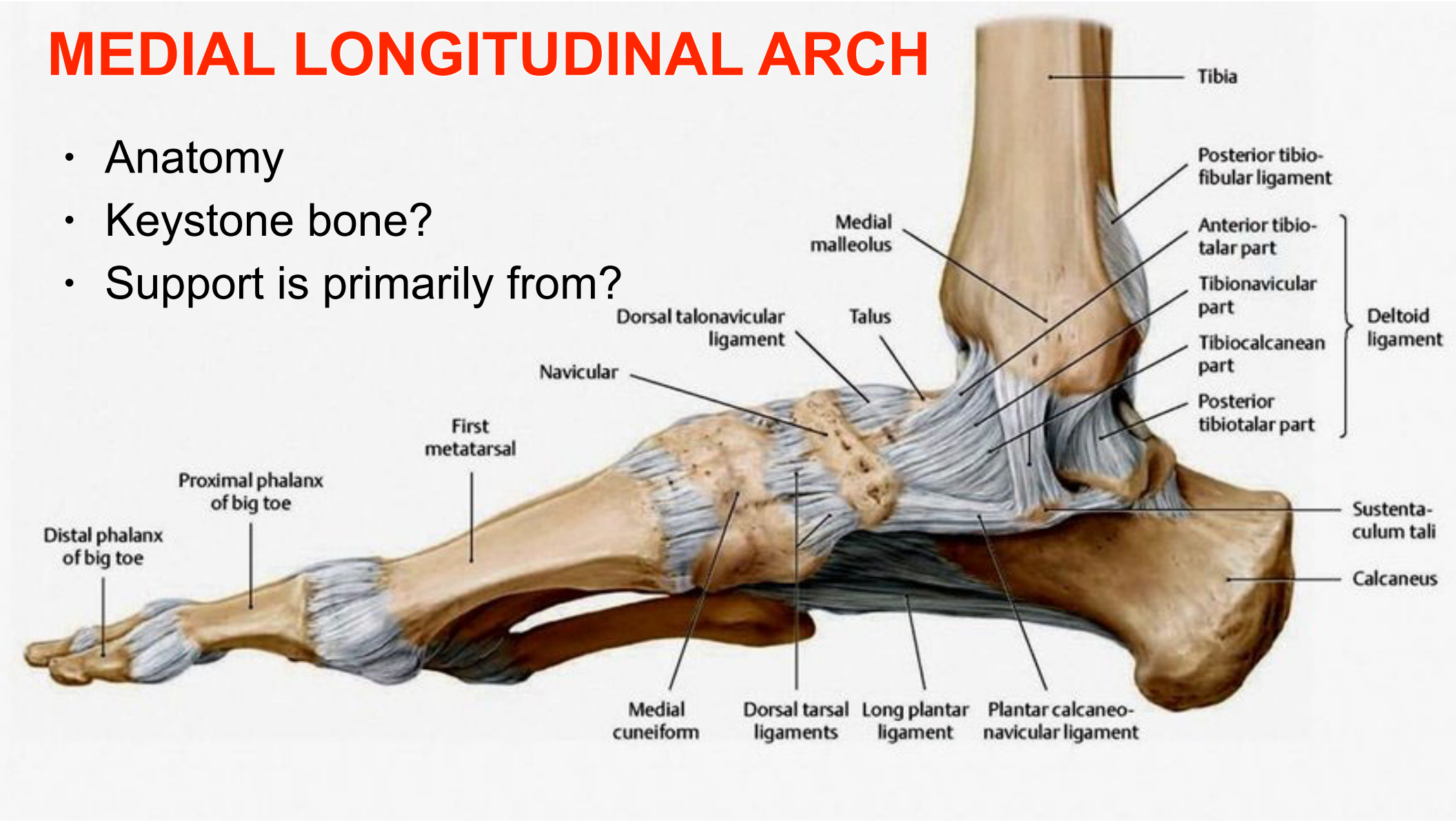
A - C = Inner Arch (Medial Longitudinal Arch)

B - C = Outer Arch (Lateral Longitudinal Arch)

A - B = Across the Balls of Feet (Anterior Transverse [Metatarsal] Arch)

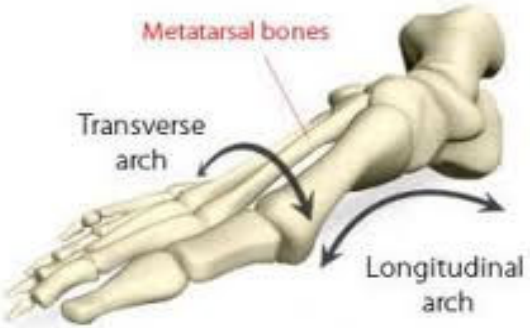
MEDIAL LONGITUDINAL ARCH

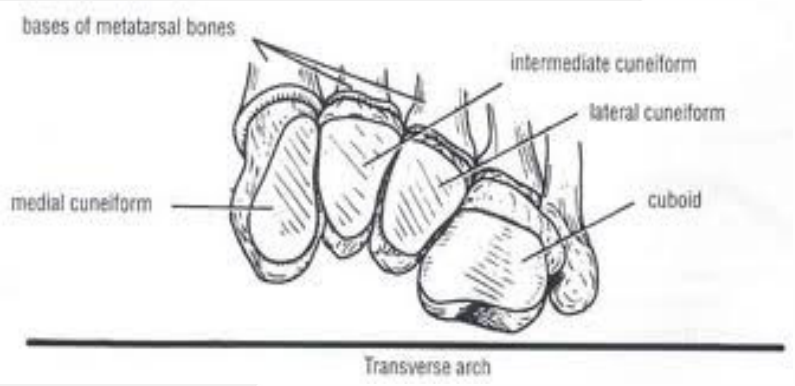
- Anatomy
- Keystone bone?
- Support is primarily from?

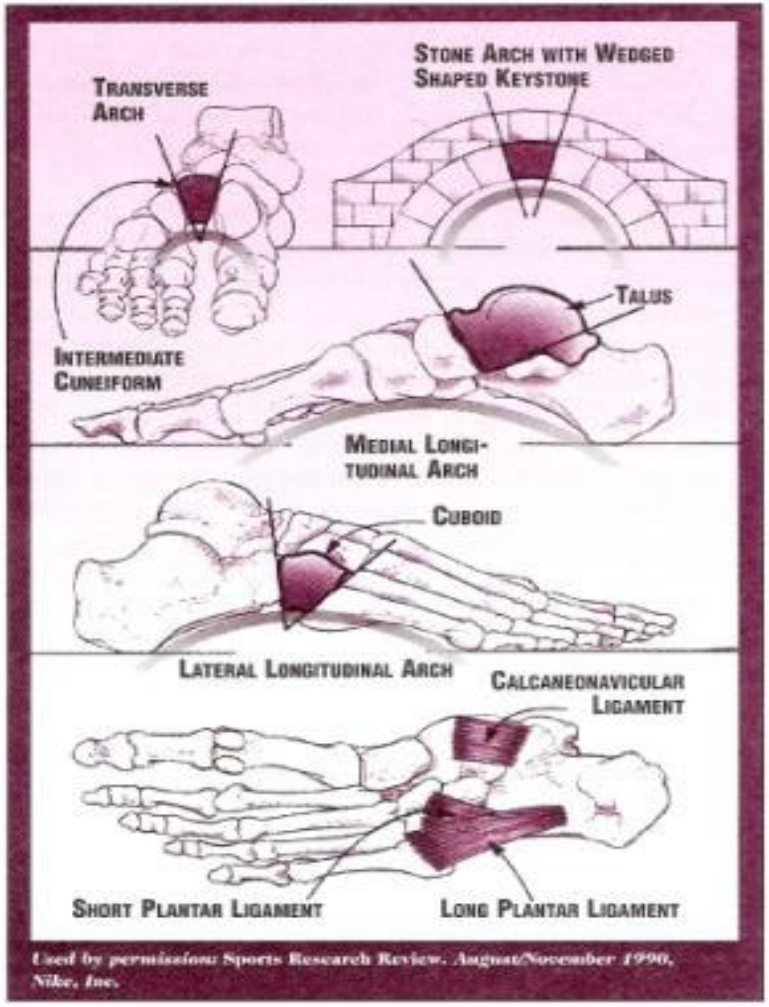


FOOT LEVELERS

TRANSVERSE ARCH





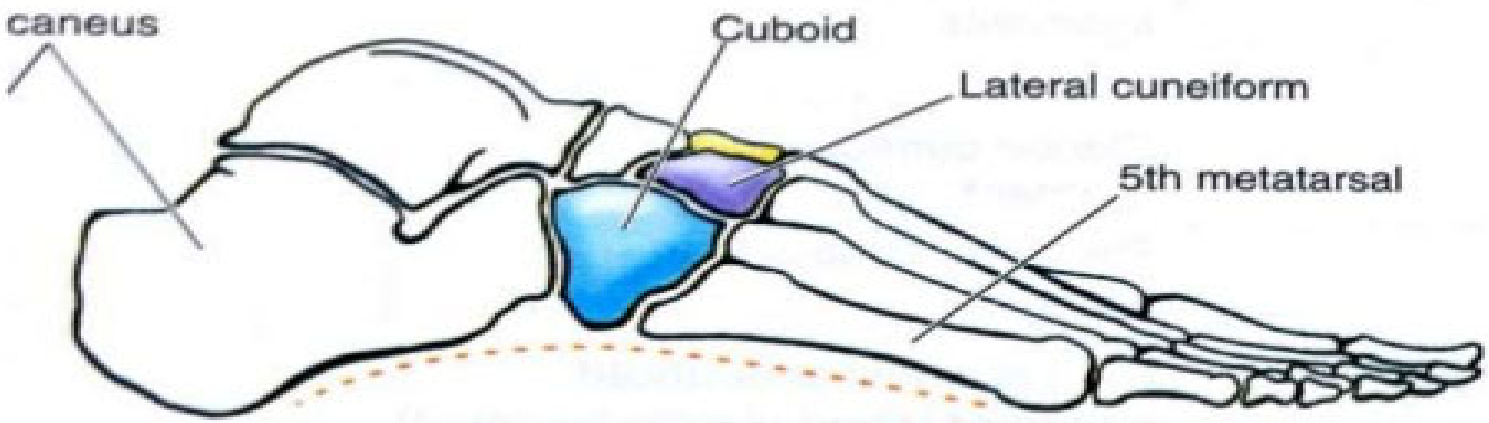


Used by permission: Sports Research Review. August/November 1990, Nike, Inc.

Lateral longitudinal Arch

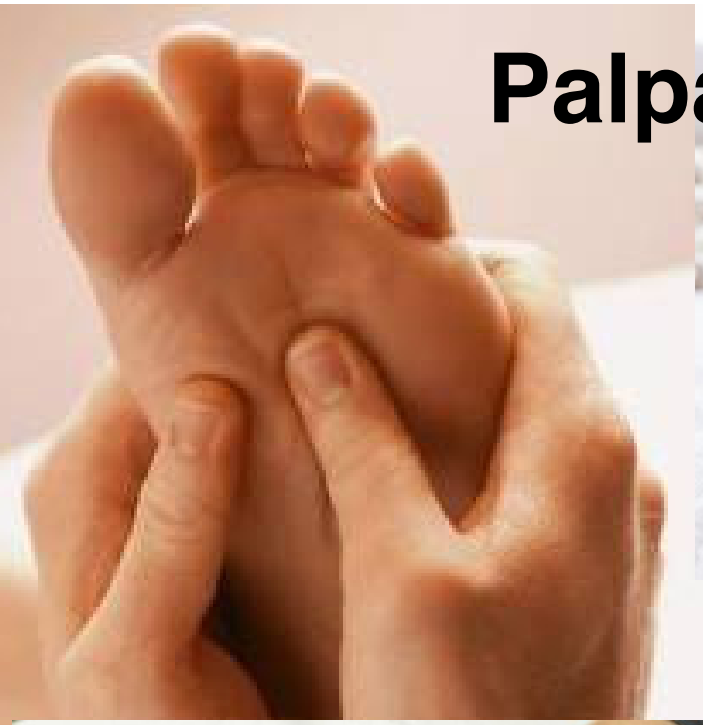
- Flatter than medial longitudinal arch.
- Rests on the ground during standing.
- It is made up of – calcaneous, cuboid, 2 lateral metatarsals.

- Keystone?



(B) Lateral longitudinal arch (lateral view)

Palpate!



What do you see? Feel?

Foot Development

Not all foot bones formed at birth. (avg. Foot length is 7.6 cm)

Navicular is last to ossify (age 2-5)

Walking starts 10-16 months

FOOT LEVELERS

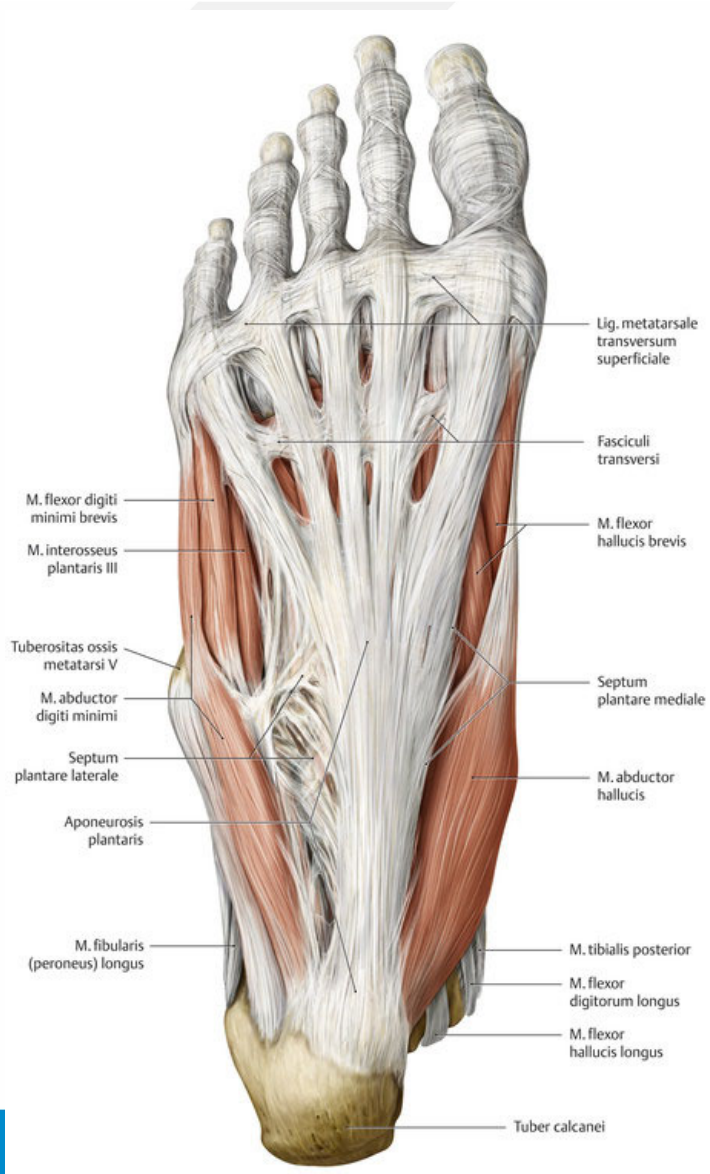
Skeletal maturity of the feet is ~ age 13 for girls and age 15 for boys.

ARCH STABILITY

- ***The highest relative contribution to arch stability was provided by the plantar fascia, followed by the plantar ligaments and spring ligament.***

- **Plantar fascia was a major factor in maintenance of the medial longitudinal arch.**

- *Huang et al: Biomechanical Evaluation of Longitudinal Arch Stabilty. Foot & Ankle, Vol. 14, No. 6, July/August 1993*

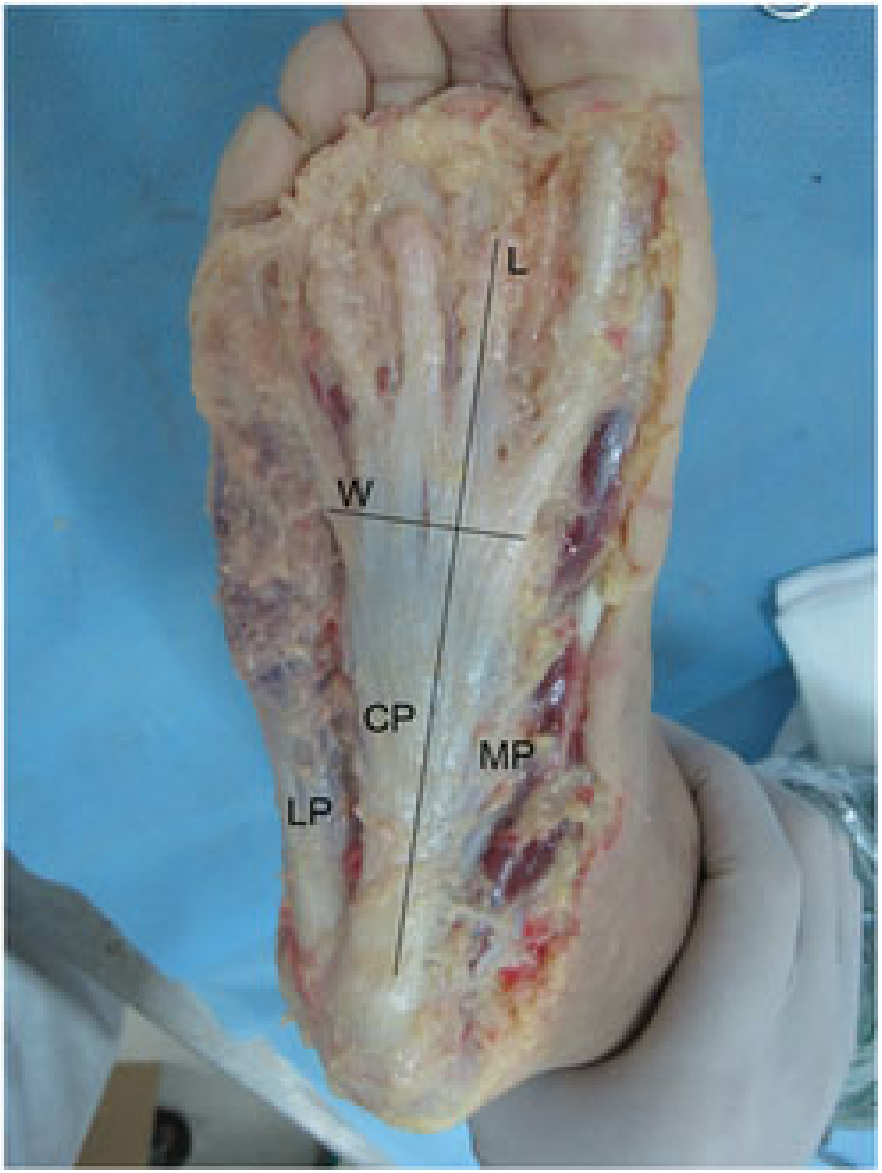


Arch Support

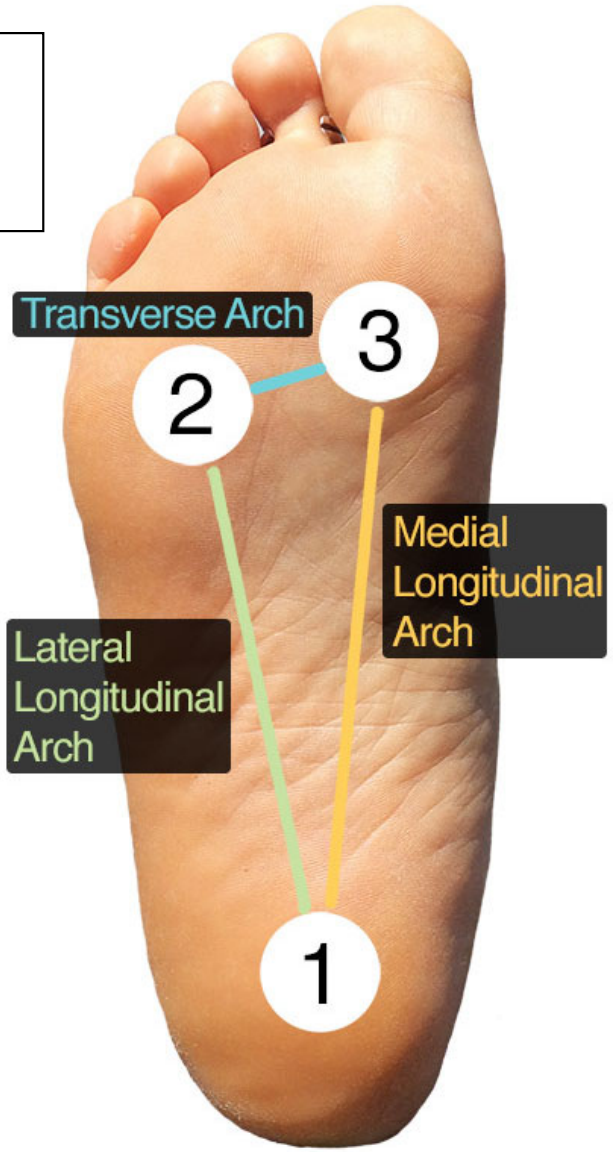
- "The first line of defense of the arches is ligamentous."

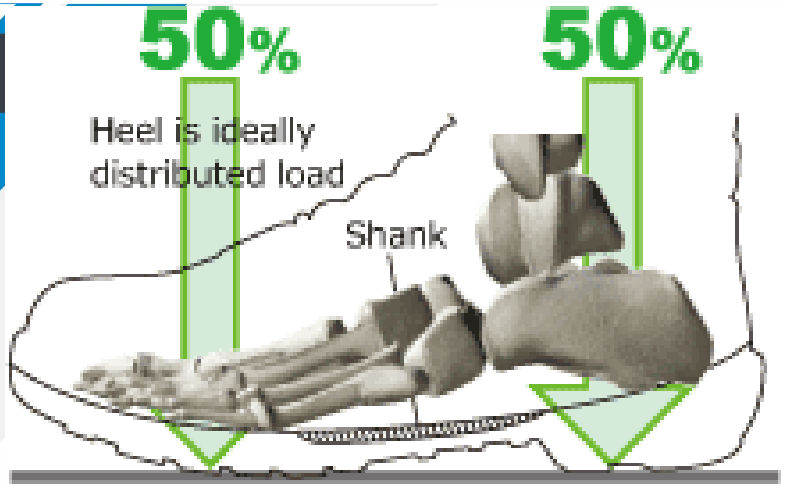
- …muscles did not come into play until a force greater than 400 pounds was exerted."

– *Basmajian JV et al. The Role of Muscles in Arch Support of the Foot: An Electromyographic Study. J of Bone and Joint Surgery, Vol 45, No 6 September 1963.*

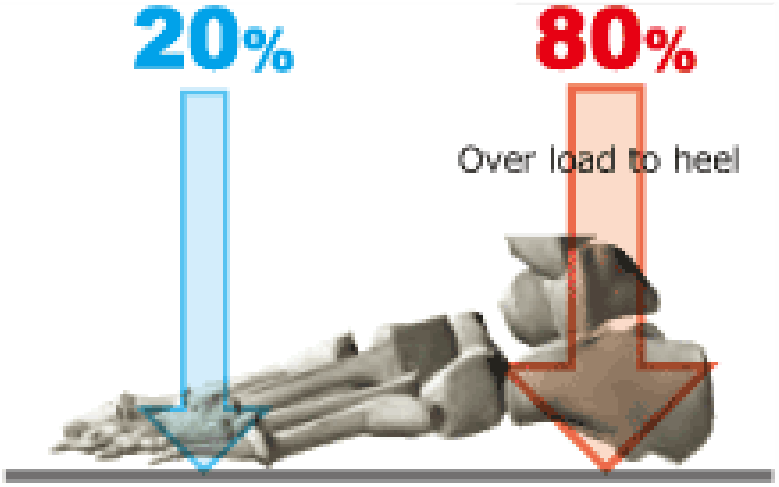


WHAT NORMALLY HAPPENS TO THE 3 ARCHES WHEN YOU STAND UP?

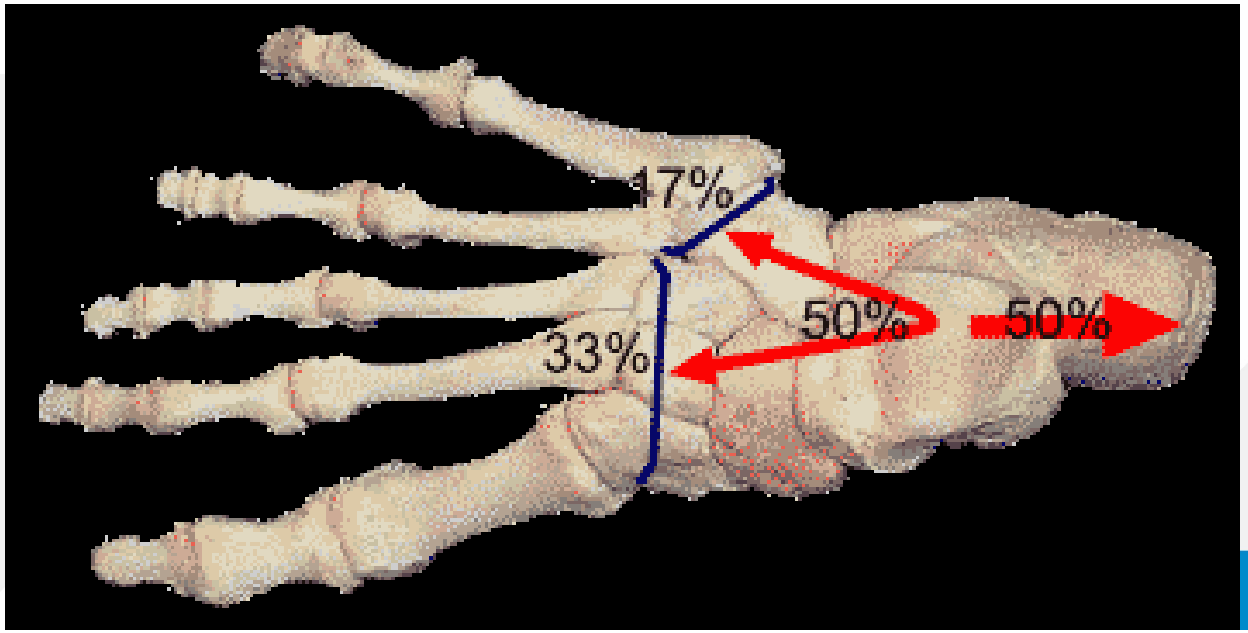




In case of having a moderate height of heel



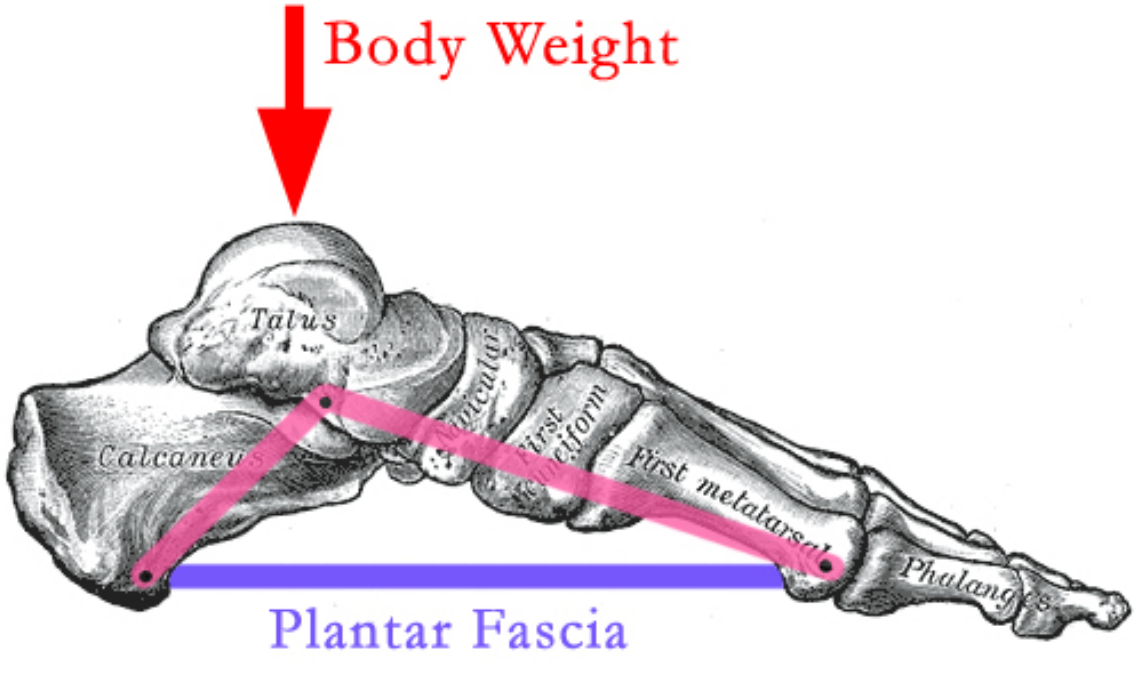
In case of not having the height of the heel



WHEN THE FOOT
HITS THE GROUND,
EVERYTHING CHANGES

FOOT LEVELERS

FOOT LEVELERS




PLEASE
STAND
UP!
…ON YOUR BARE FEET

Weight Shift Exercise

- Equal
- Non-Dominant
- Dominant

FOOT LEVELERS

Patient Awareness Demo

Excessive Supination

Feel your arches, ankles, knees, hips, pelvis..

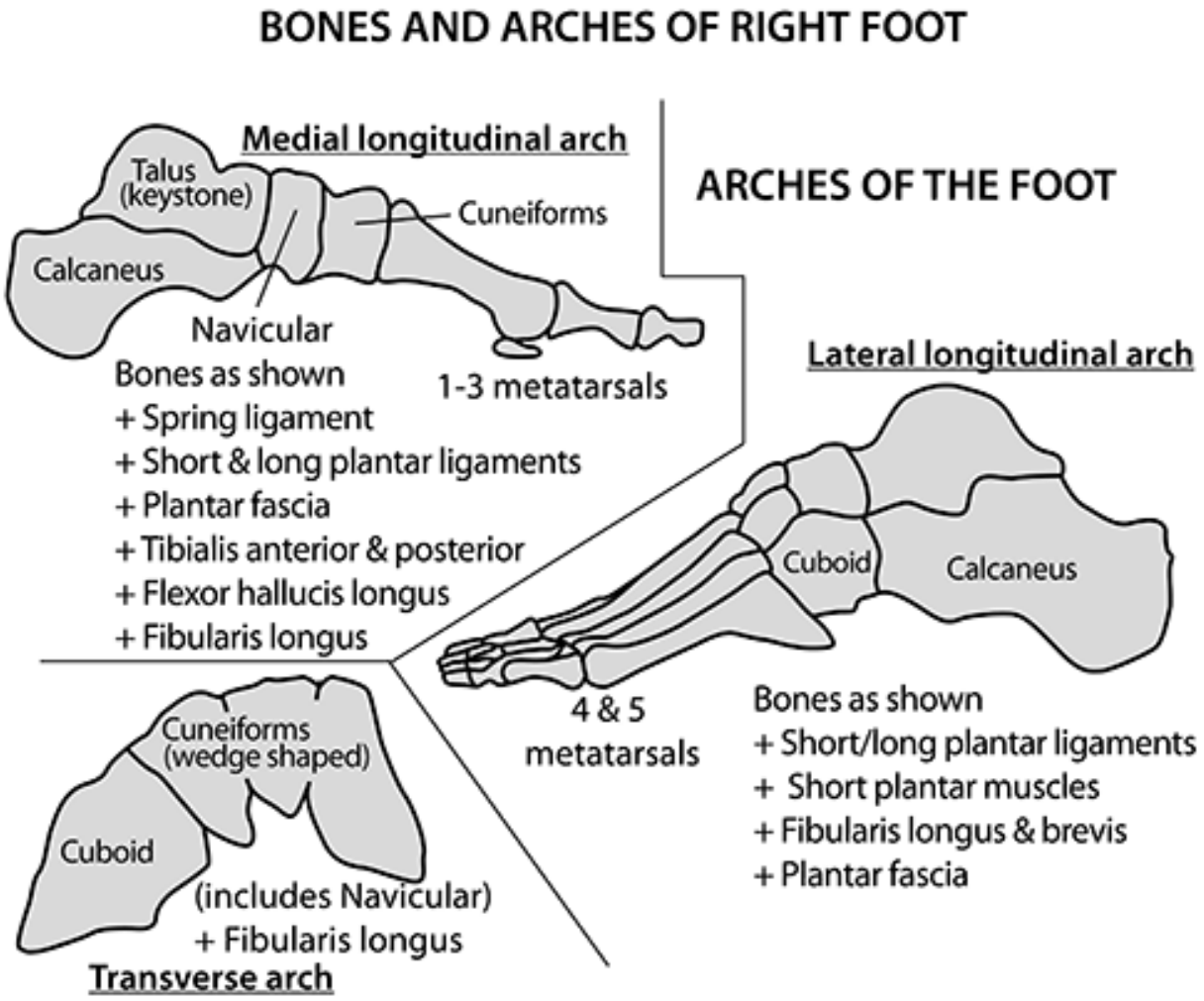
Patient Awareness Demo

(Makes Foot-Spine-NS Connection)

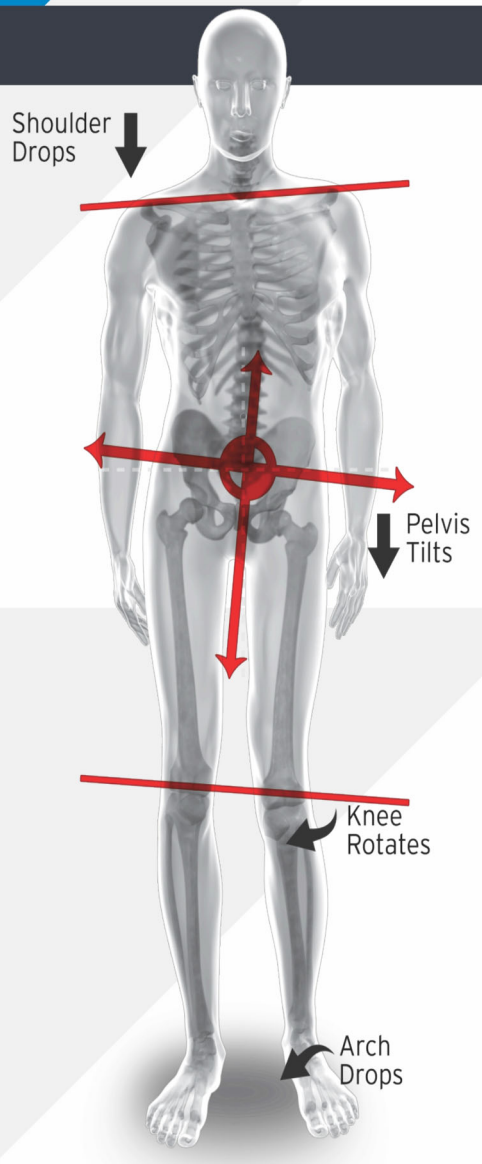
- Pronate extremely, supinate extremely with hands on greater trochanters.
- Patients ***SEE*** and ***FEEL*** connection between feet, knees, hips, pelvis and spine.

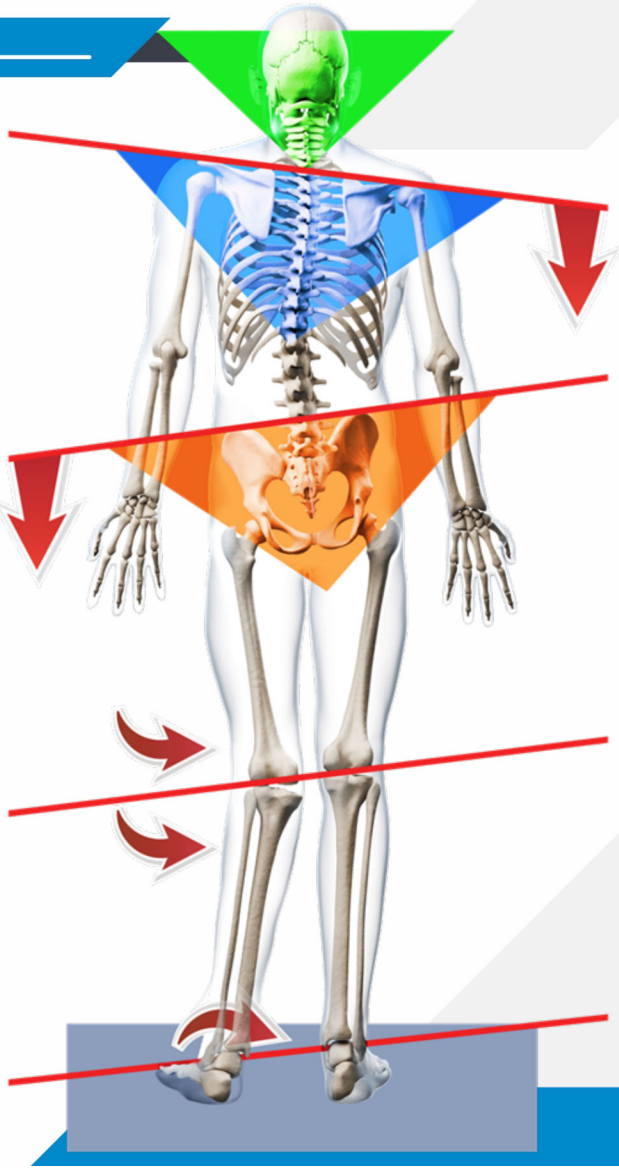
ARCH FUNCTIONS

- Shock absorption
- Support body weight
- Propel body

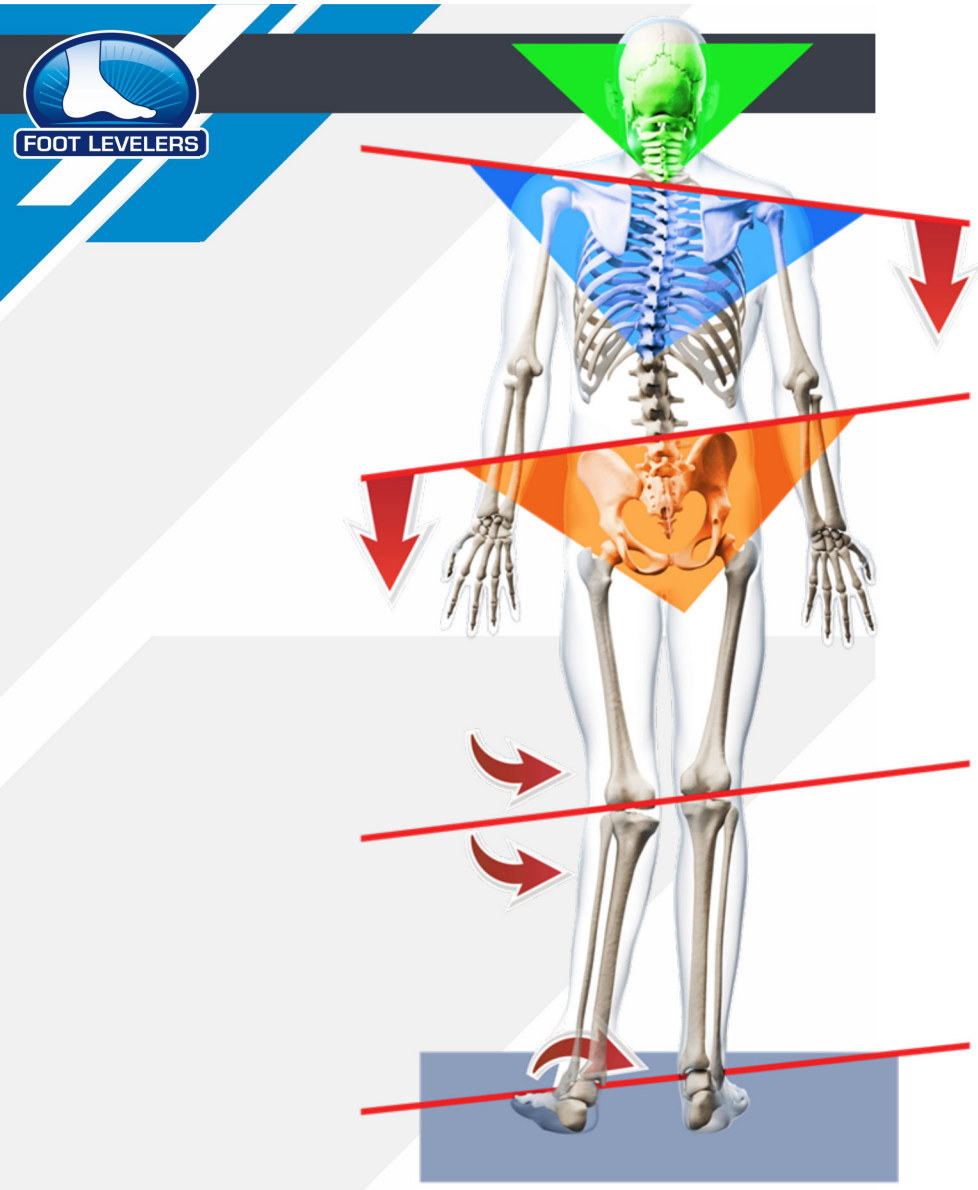


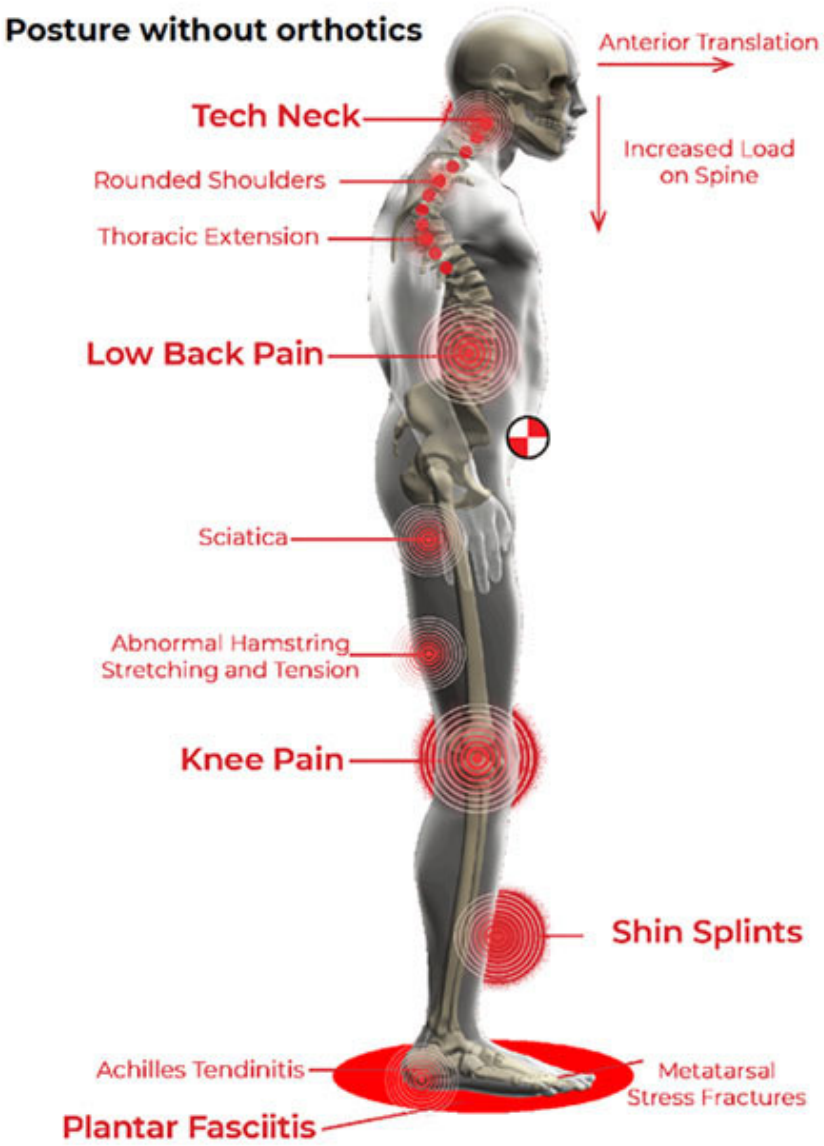
FOOT LEVELERS





FOOT LEVELERS





FOOT LEVELERS

FOOT LEVELERS

Heel strike force sends a shock wave up the leg to the pelvis, spine and skull

GROUND FORCE

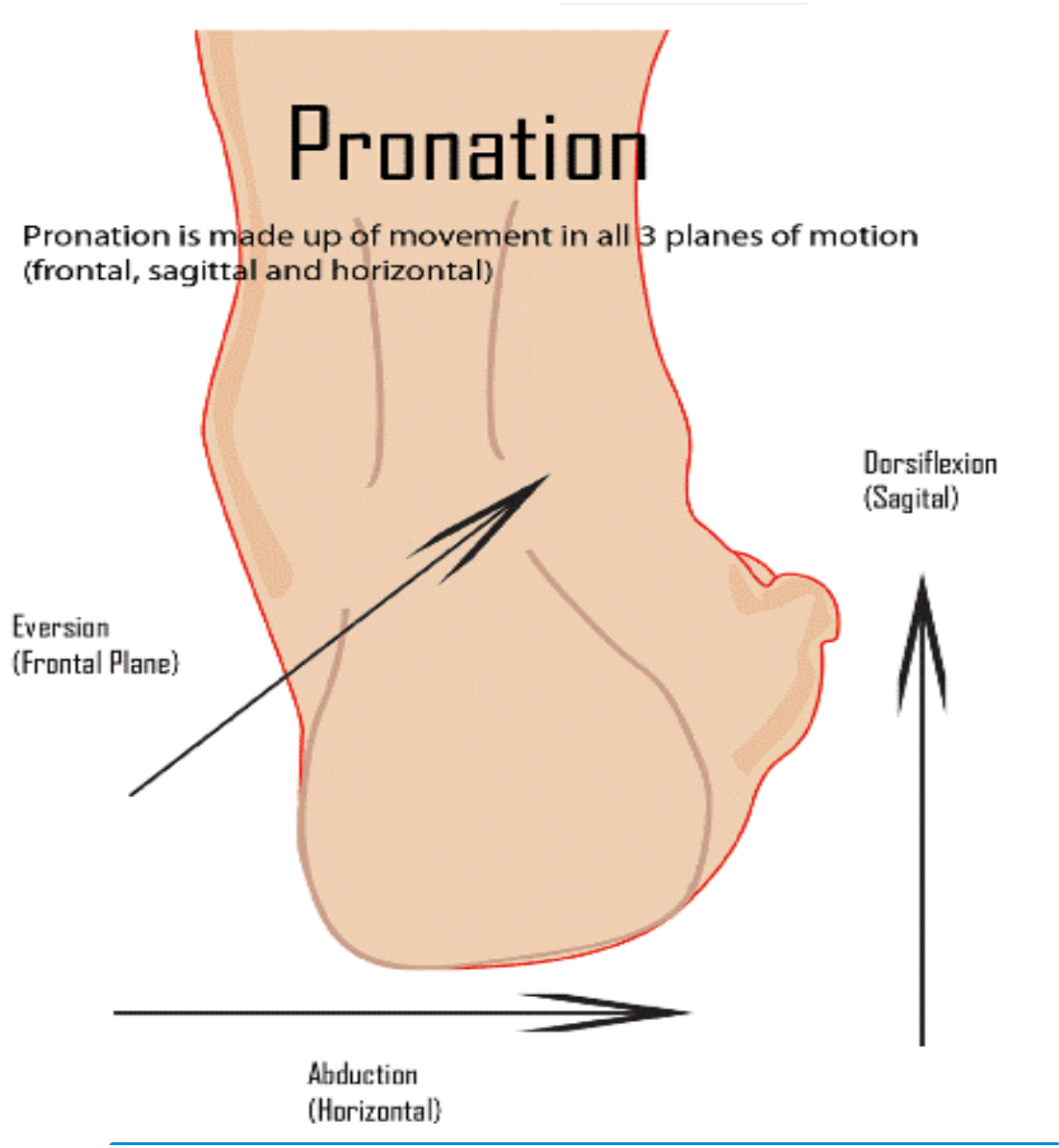
5 G's of force on the foot/ankle becomes

.5 G's at the skull (TMJ) within 10 ms*

*Hyland, John K., Musculoskeletal Shock: Causes and Prevention, 1980

Pronation

- Unlocks foot
- Absorbs ground shock (**30%**),

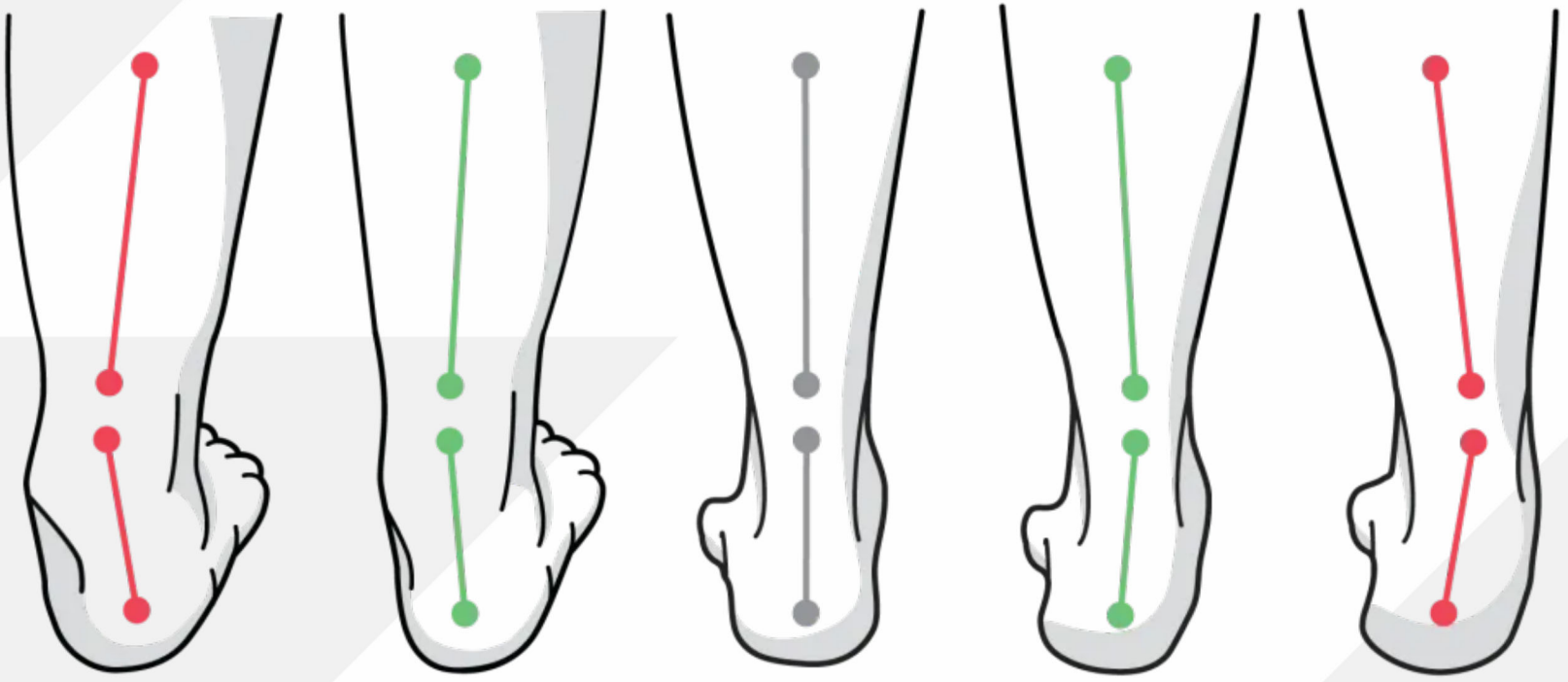


Normal Pronation Is Important!

- Conforms foot to grip the ground
- Then re-stiffens (supinates) for leverage as leg propels forward to the next step.

FOOT LEVELERS

Pronation is necessary for correct biomechanics.



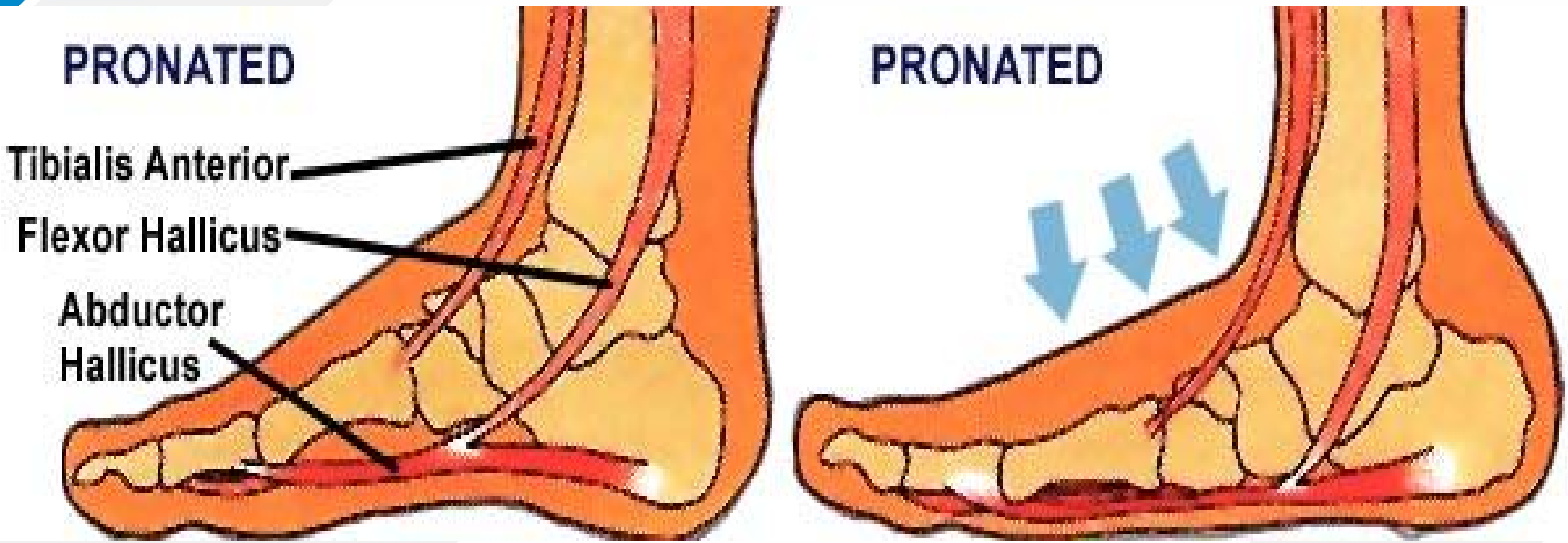
ELASTIC VS. PLASTIC DEFORMATION

Plastic Deformation

Permanent elongation of tissue after application of prolonged, non-disruptive mechanical force.

FOOT LEVELERS

EXCESSIVE FOOT PRONATION

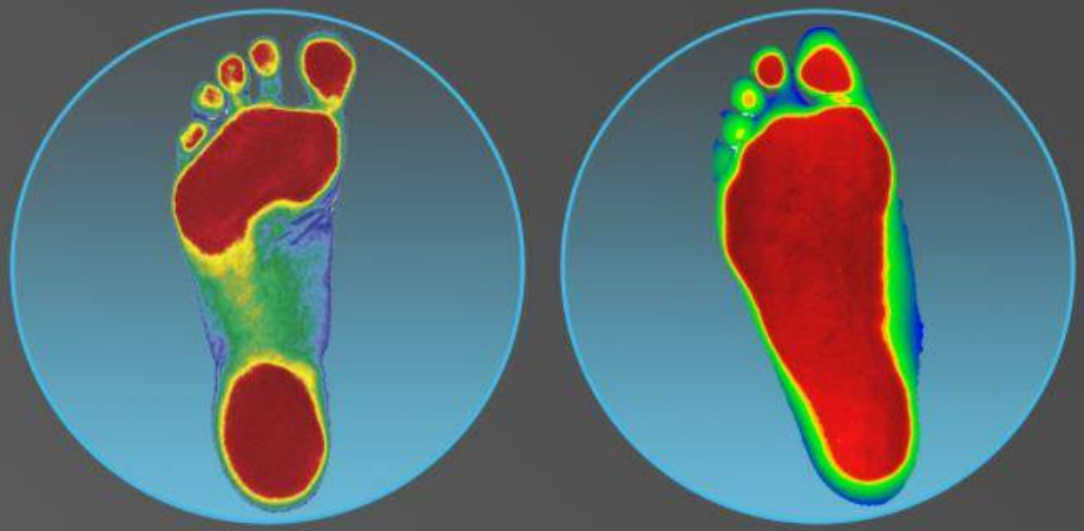


Plastic Deformation takes over!

99% of Population is Overpronated

Real-life, real-world experience.

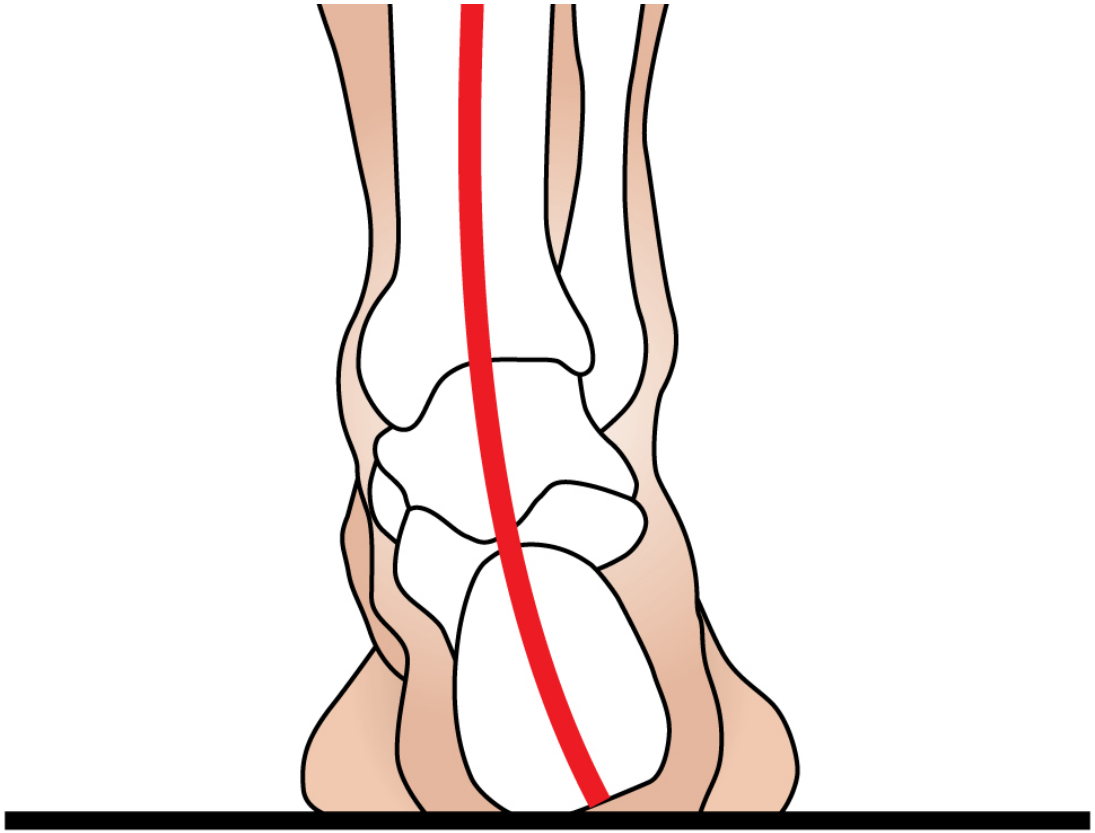
For nearly **70 years**, Foot Levelers has analyzed ***millions*** of feet. One thing we've learned: 99% of the population overpronates!



What does that mean for you? It means your feet do not perform like the optimal foot. As a result, your body is suffering which brings pain, underperformance, and injury.

The remaining 1% is a mix of supinators and “healthy” weight bearing individuals.

FOOT LEVELERS



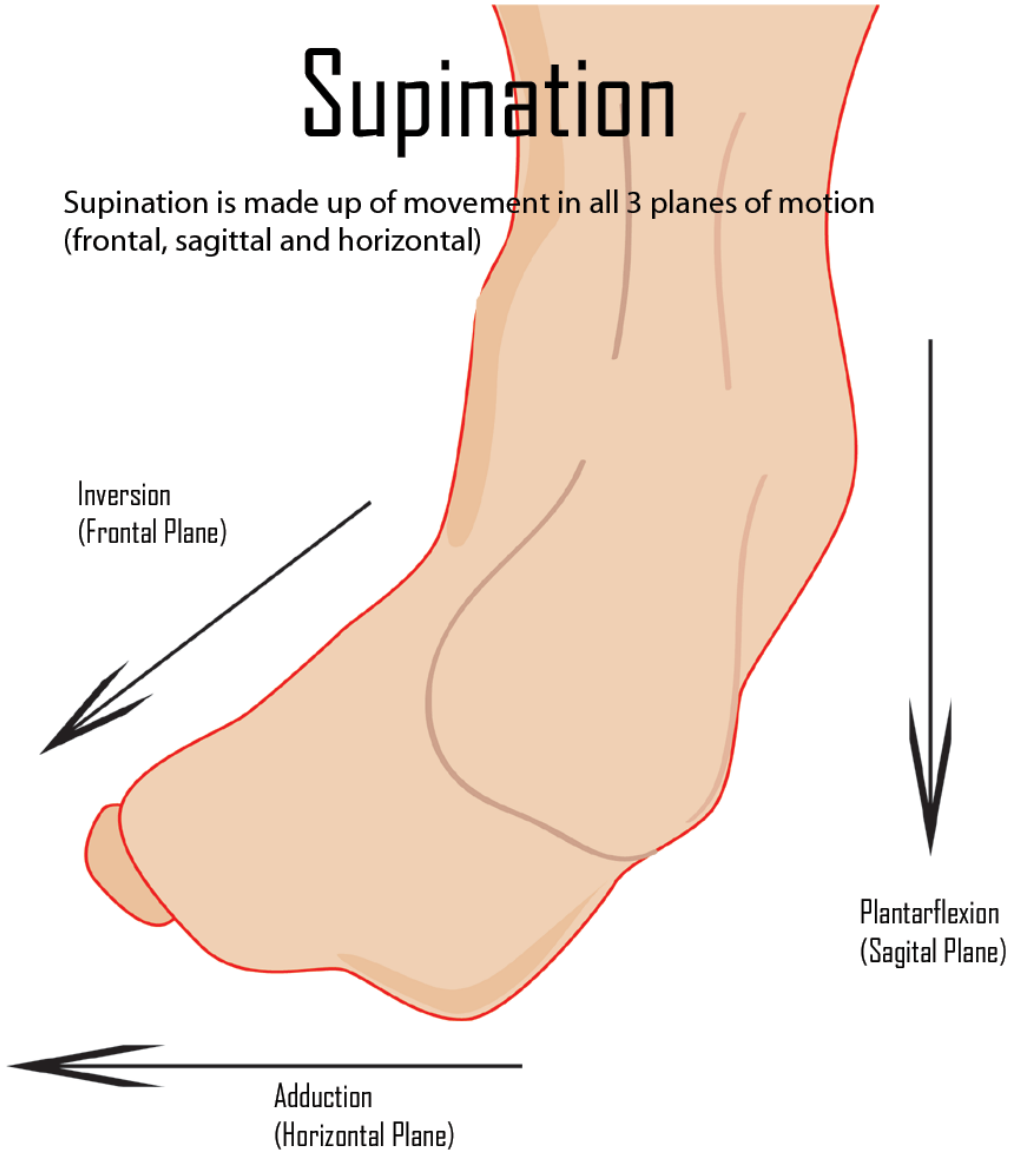
99% of the population has some degree of overpronation

FOOT LEVELERS

FOOT LEVELERS

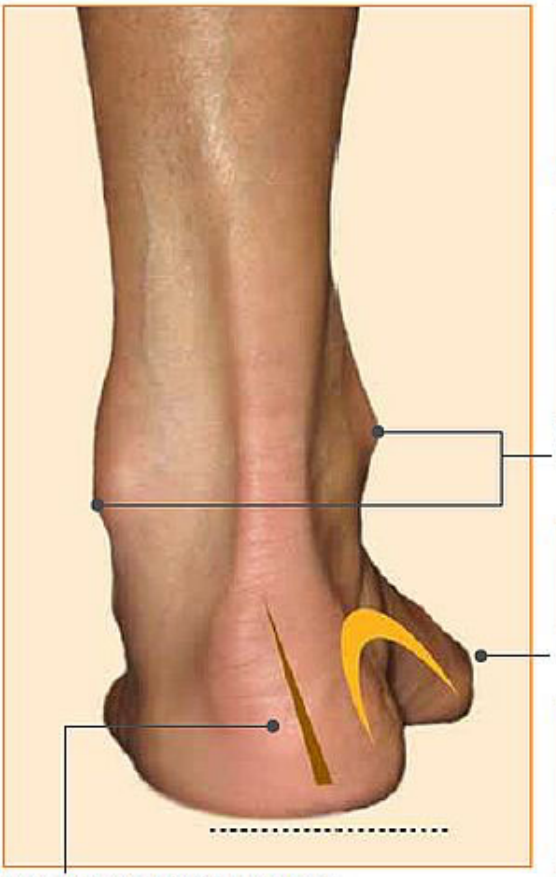
SUPINATION (<1%)

- Flattened lateral & transverse arches
- Stress on lateral ankle, knee, hip, LB

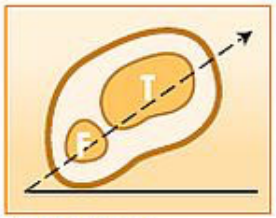


SEVERE PES CAVUS

The Quad A foot-type is commonly thought of as an over-supinated or Severe Pes Cavus foot. This condition, also known as a Torque Foot, occurs when an Uncompensated Rearfoot Varus is coupled with a Large Rigid Forefoot Valgus.

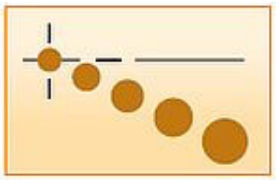


LARGELY INVERTED HEEL ALIGNMENT



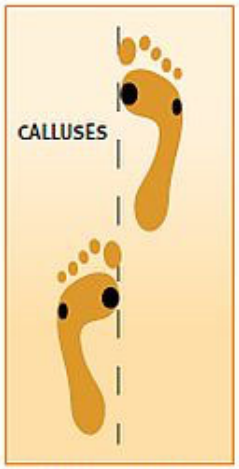
LARGE EXTERNAL TIBIAL/FIBULAR ROTATION

CAVUS/HIGH ARCH



VALGUS FOREFOOT ALIGNMENT

PROPELS FORCEFULLY FROM 1st METATARSAL



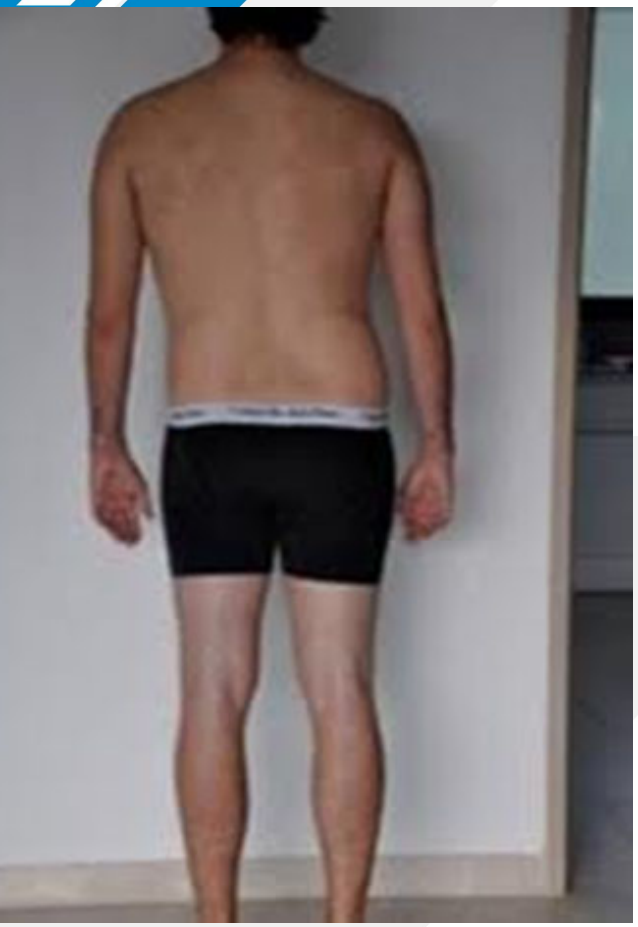
FOOT PROGRESSION ANGLE

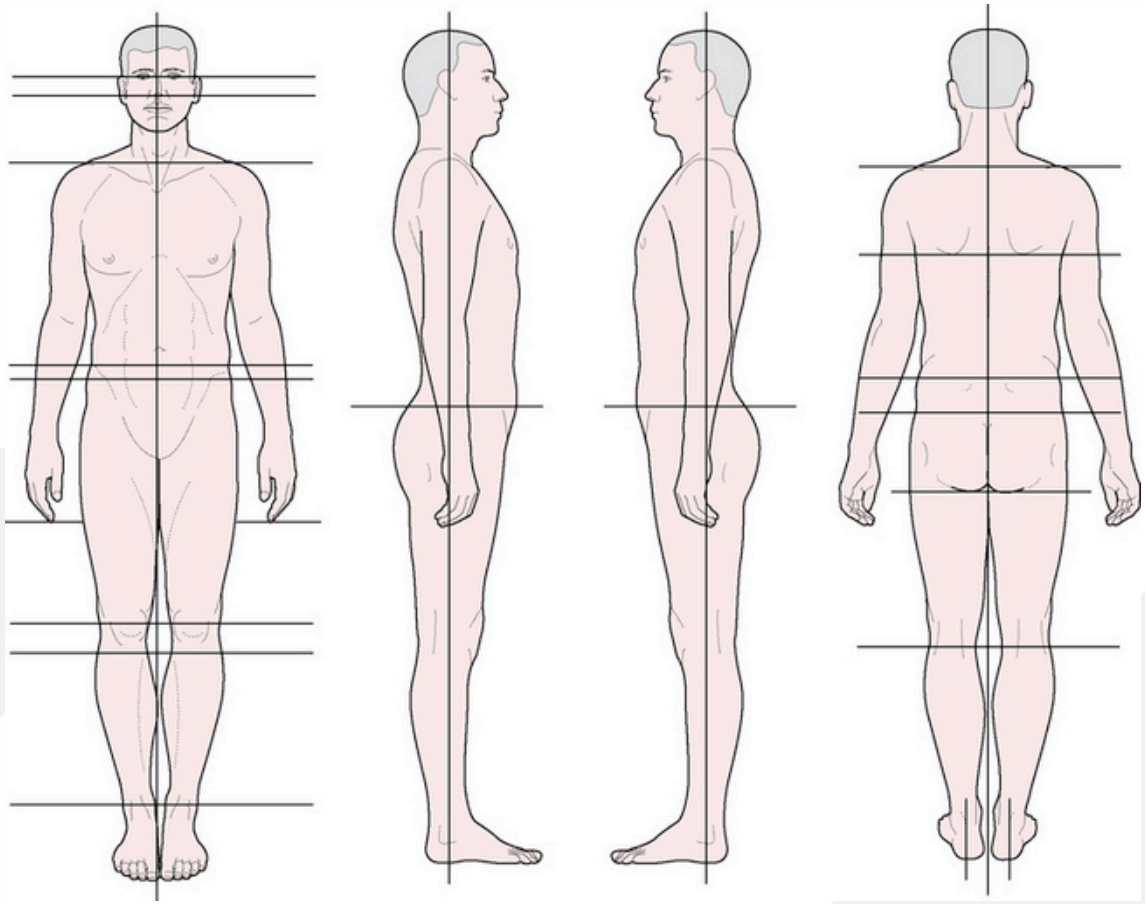
- Poor Shock Attenuation
- Excessive Supination
- Narrow or Cross Over Gait

LOWER EXTREMITY ASSESSMENT TOOLS:

- Standing posture
- Gait analysis
- Manual Muscle Testing
- 3-D, Digital, Laser Scan

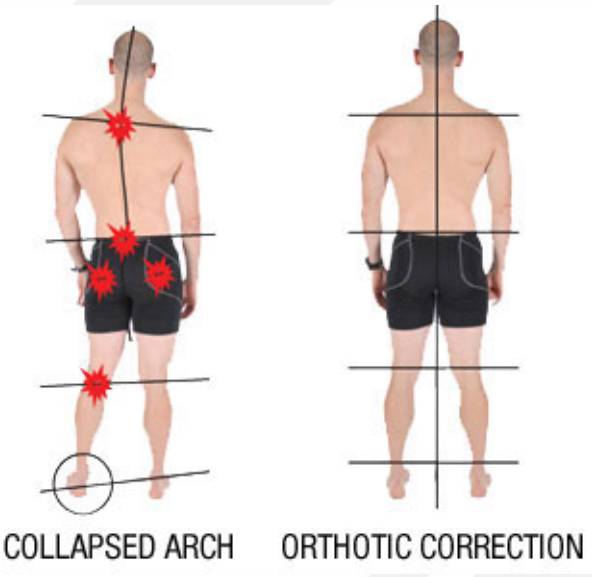
Standing Posture





FOOT LEVELERS

POSTURE OBSERVATIONS:

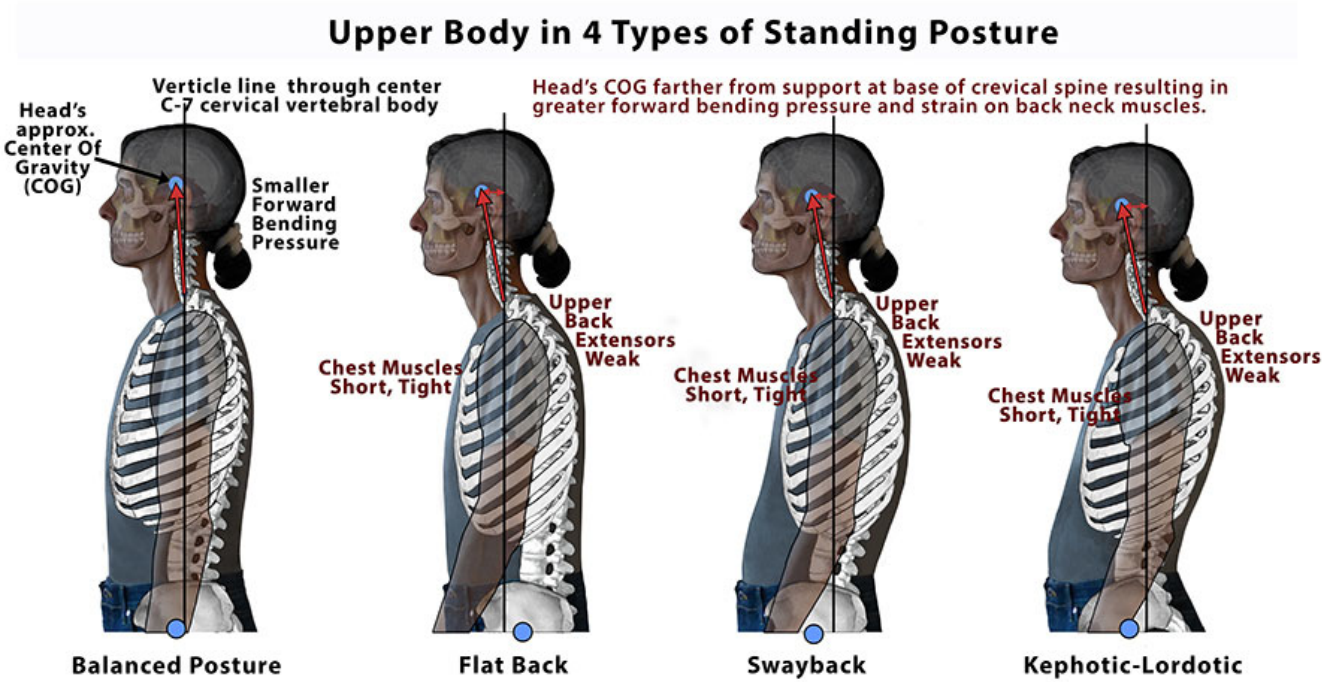


- Feet/Arches - dropped/flat or high
- Ankles - rolling in/out
- Knees - knock knees/bow leg
- Hips - high hip on one side
- Pelvis - un-level, tilted forward/back

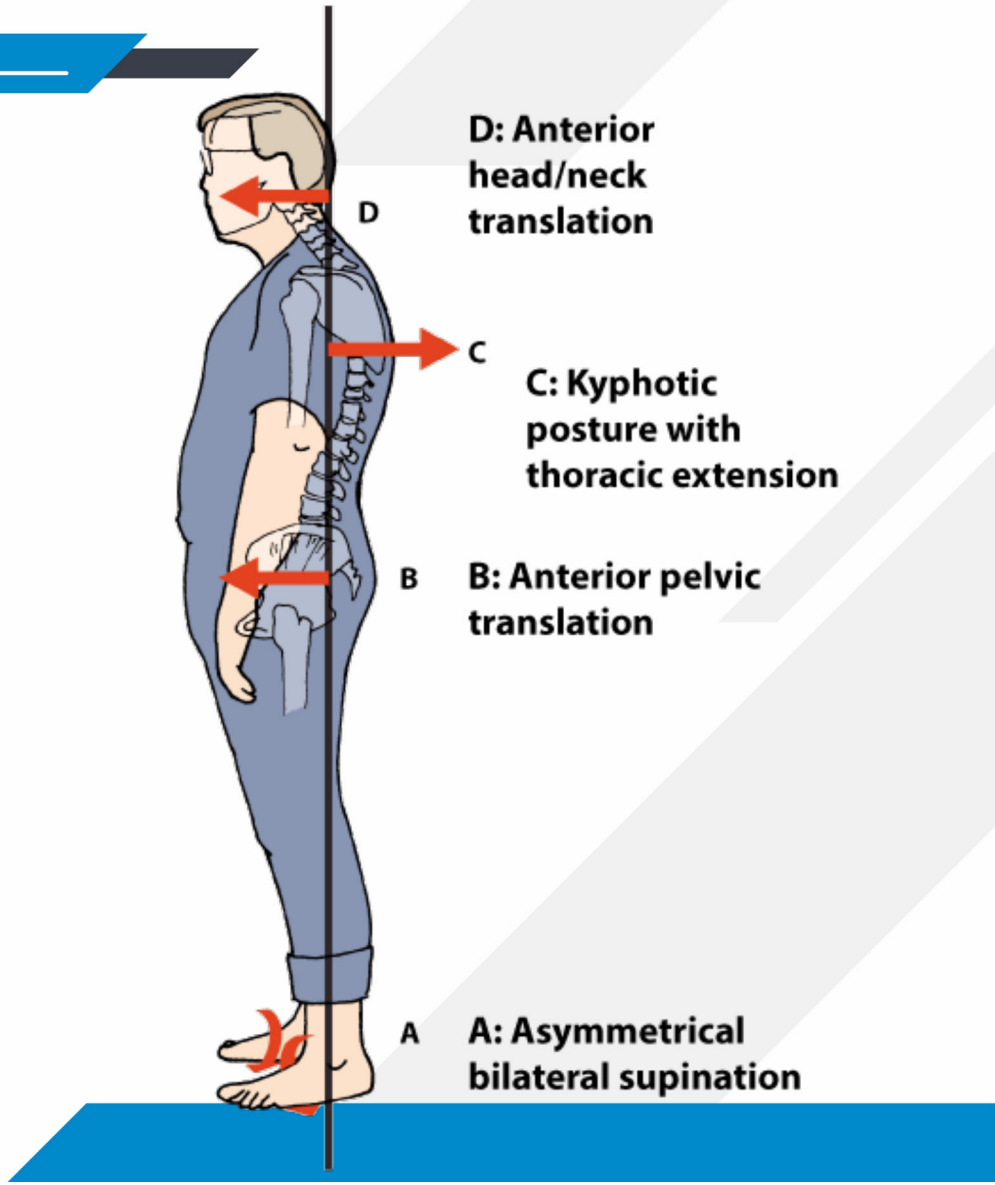
FOOT LEVELERS

WHAT DO YOU SEE?

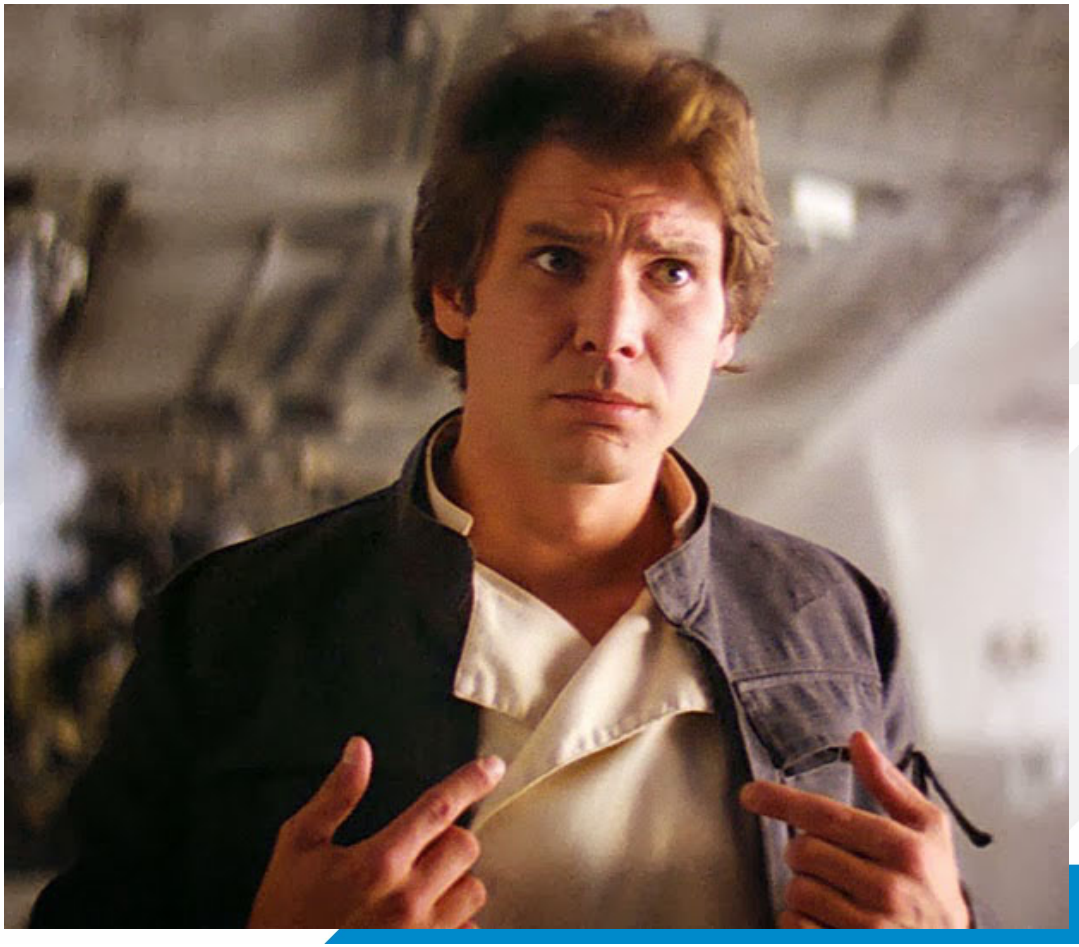
- Spine – lateral curvature?
- Shoulders – high shoulder or forward?
- Head – Tilt, ant./post. translation?



4 Global Postural Distortions caused by Excessive Pronation



Stand up & pick a partner!



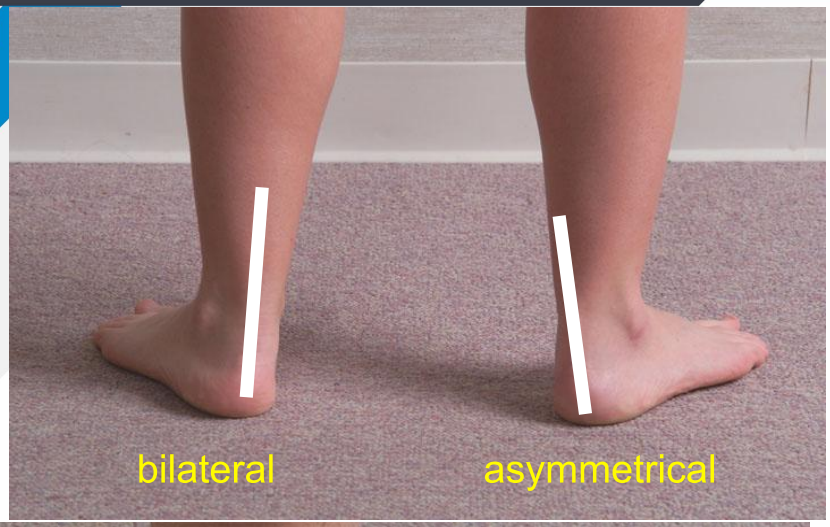
FOOT LEVELERS

"THE 2 SECOND EXAM"

Asymmetrical, bilateral, over-pronation

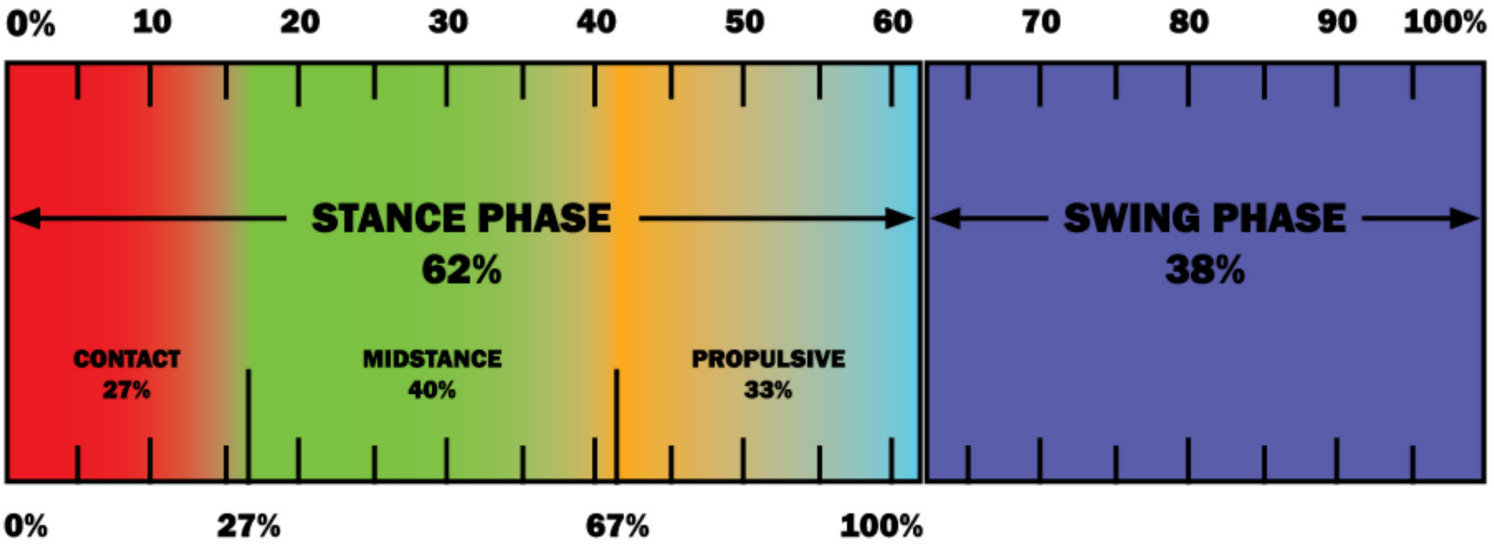
- Achilles tendons bowing inward or outward?
- Medial Arches dropping or high?

WHY AM I OVER PRONATING?



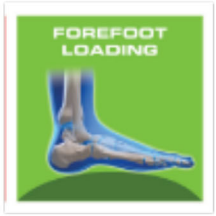
- Joint Fixation
- Hypermobility/Instability
- Muscle Imbalance
- Acute/Chronic Injuries

Gait Cycle


0%
10
20
30
40
50
60
70
80
90
100%
STANCE PHASE
62%
SWING PHASE
38%
CONTACT
27%
MIDSTANCE
40%
PROPULSIVE
33%
0%
27%
67%
100%

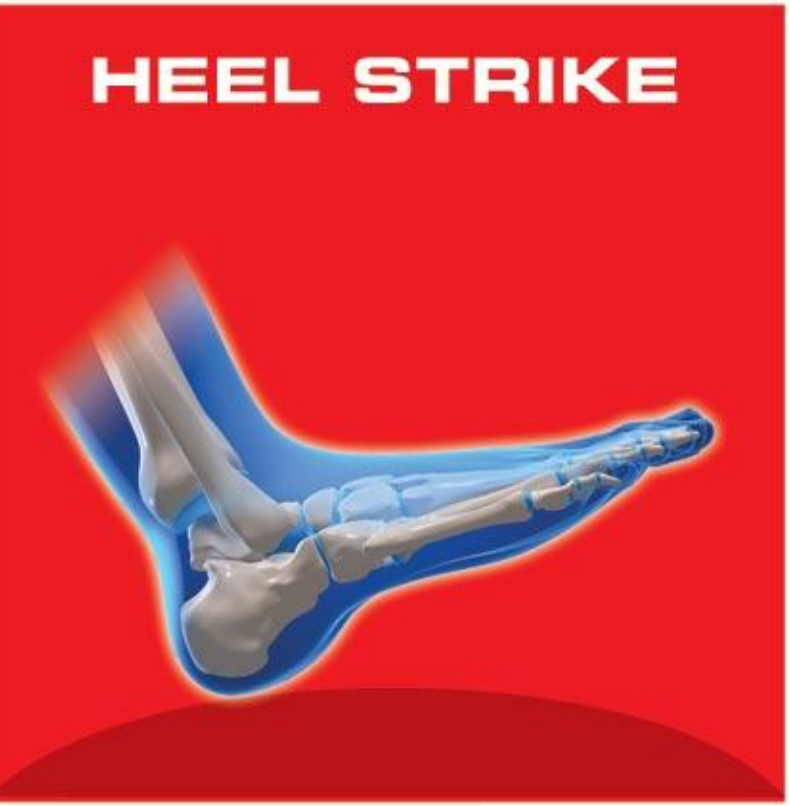

HEEL STRIKE
FOREFOOT LOADING
HEEL LIFT
TOE-OFF

Stance Phase of Gait



STANCE PHASES OF GAIT	CONTACT 27% OF STANCE PHASE	MIDSTANCE 40% OF STANCE PHASE	PROPULSIVE 33% OF STANCE PHASE
LEG MOTION	INTERNAL ROTATION OF LEG	EXTERNAL ROTATION OF LEG	
SUBTALAR JOINT MOTION	PRONATION	SUPINATION	

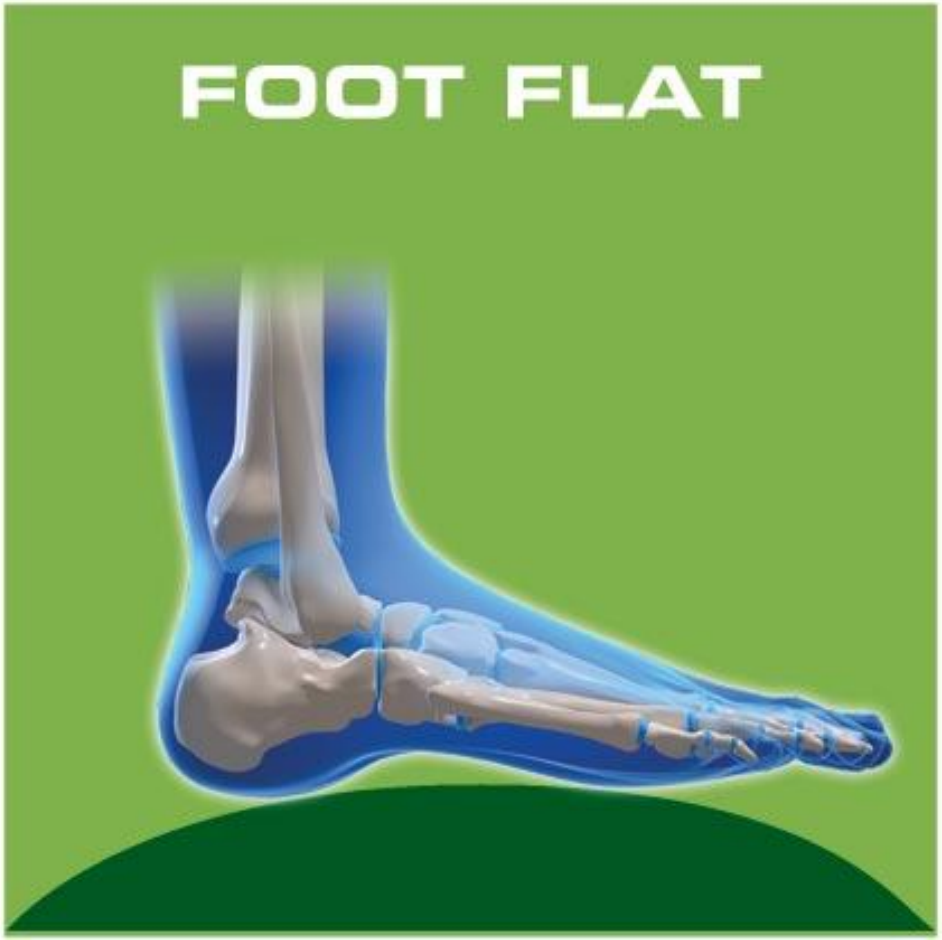
HEEL STRIKE



- Calcaneus inverts
- Foot supinates
- Force goes from heel to ankle

FOOT LEVELERS

FLAT FOOT



- Foot pronates at subtalar joint
- Medial rotation of tibia/femur

TOE OFF

- Foot supinates
- MTP’s dorsiflex
- Plantar fascia tightens
- Leg externally rotates

Walking 1 Mile puts approximately

50 tons

of pressure on

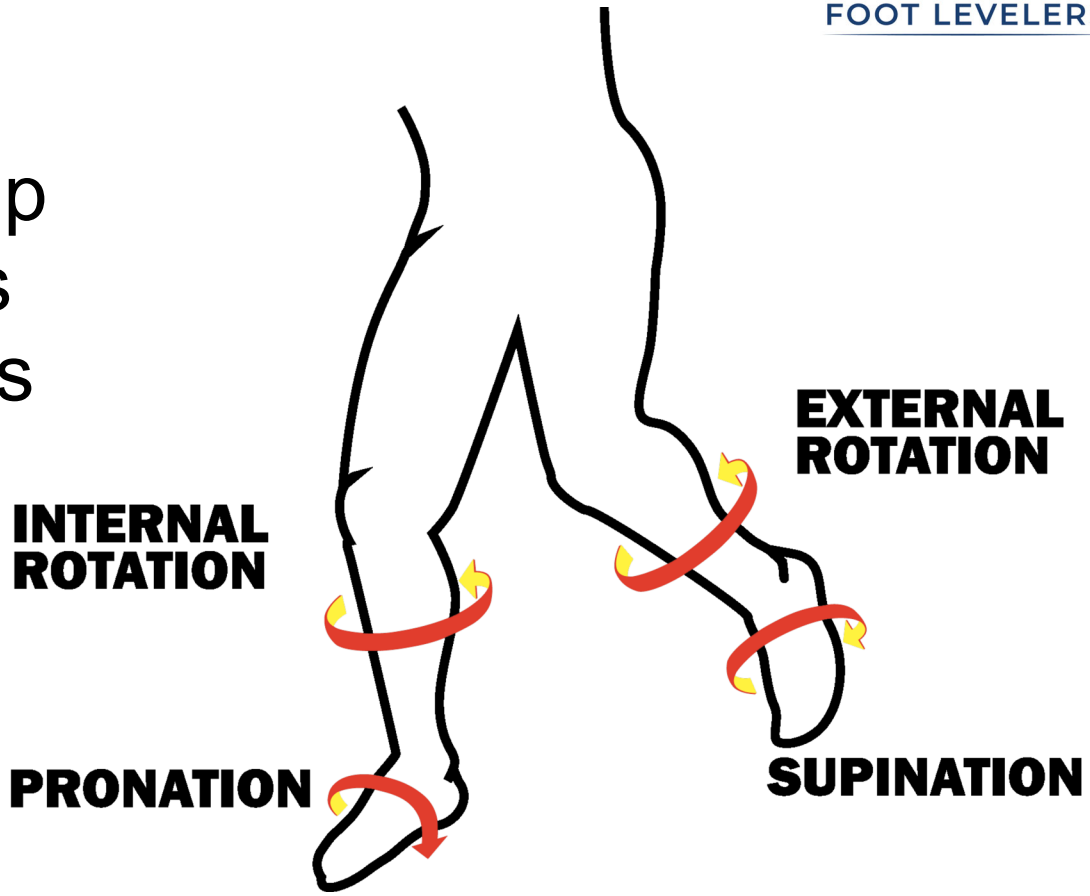
your arches.

Running = 3x-5x more

Lower Extremity Biomechanics

FOOT LEVELERS

Foot Levelers orthotics help improve pelvic movements and gait patterns as well as reducing the effects of fatigue from walking.



Journal of Manipulative & Physiological Therapeutics, 2001 Vol. 24 #4, May

Foot/Ankle Limits of Normal Movement

	WALKING	RUNNING
PRONATION	8°	12°
SUPINATION	2°	4°

FOOT LEVELERS

Gait

	0%	27%	67%	100%
TIBIA	INTERNAL ROTATION	EXTERNAL ROTATION		
ANKLE JOINT	PLANTAR FLEXION	DORSIFLEXION	PLANTARFLEXION ON TIBIA AND DORSIFLEXION ON CALCANEUS	
TALUS	PLANTAR FLEXION ON TIBIA AND CALCANEUS ADDUCTION ON CALCANEUS AND ABDUCTION ON TIBIA; NET = ADDUCTION	DORSIFLEXION ON TIBIA AND CALCANEUS ABDUCTION ON CALCANEUS AND ADDUCTION ON TIBIA; NET = ABDUCTION	NET = PLANTAR FLEXION ABDUCTION ON CALCANEUS AND ABDUCTION ON TIBIA	
CALCANEUS	EVERSION	INVERSION		
SUBTALAR	PRONATION	SUPINATION		
MIDTARSAL	SUPINATION	PRONATION		
FIRST RAY	DORSIFLEXION + INVERSION		PLANTARFLEXION+EVERSION	

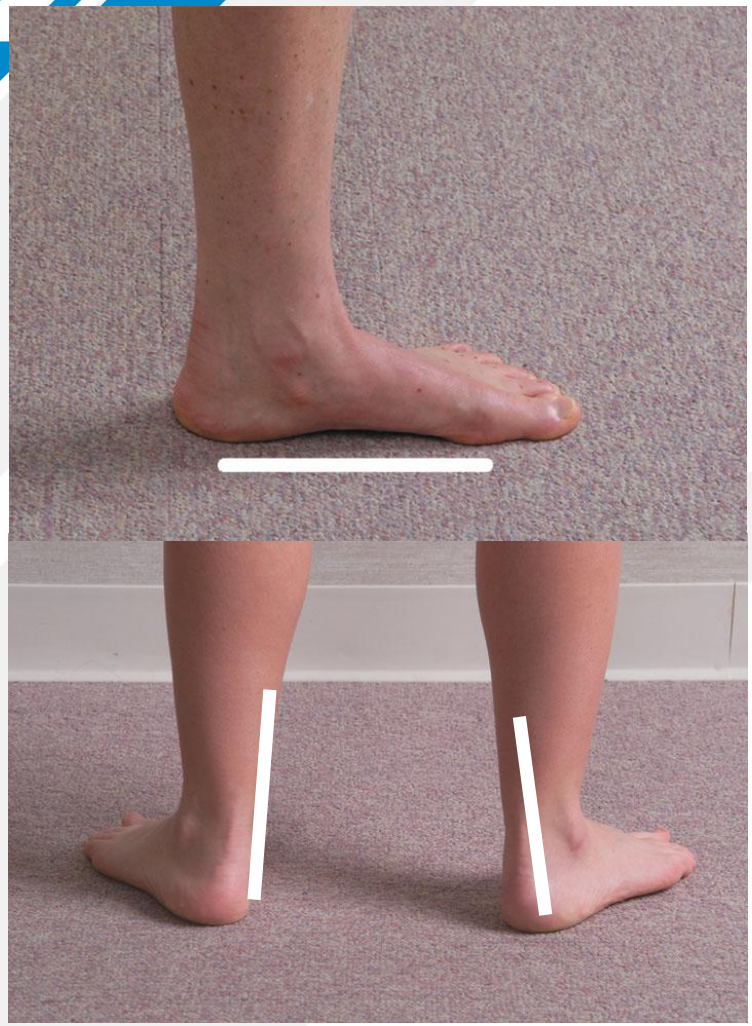
Orthopedic Physical Assessment ED – 5 David Magee, Sannders

FOOT CONDITIONS BY AGE

- 99% of feet are normal at birth
- 8% of feet develop trouble by age 1
- 41% of feet develop trouble by age 5
- 80% of feet develop trouble by age 20
- Nearly everyone has foot trouble by age 40

FOOT LEVELERS

WHAT ELSE DO YOU SEE?



knee pain

current/previous injury

DJD

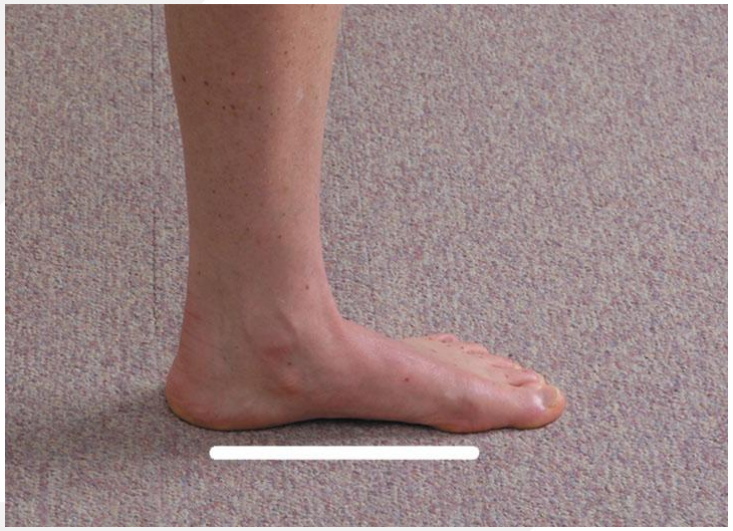
Ankle Sprains

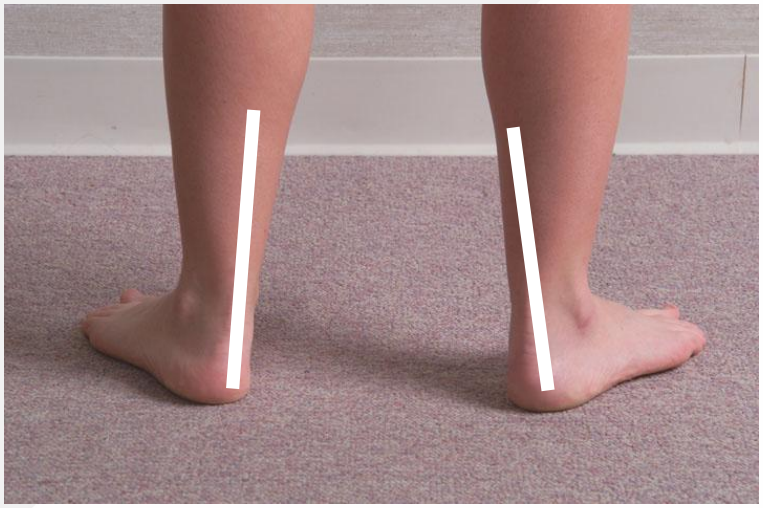
Plantar Fasciitis

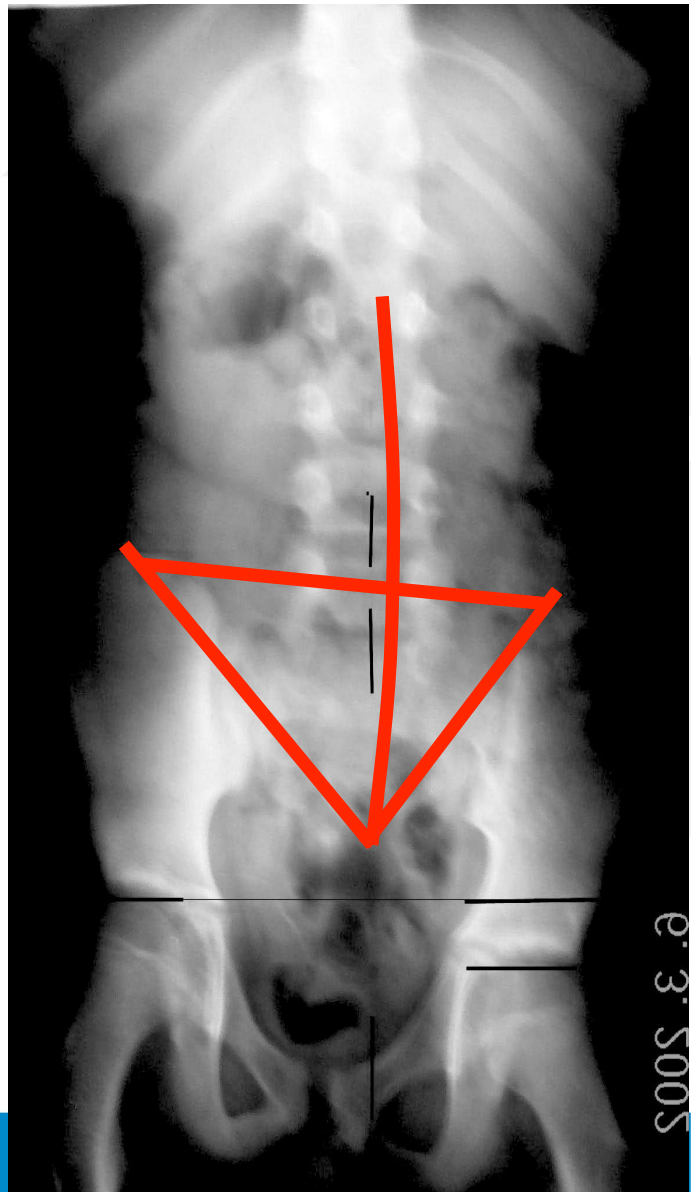
Heel Spurs

FOOT LEVELERS

What Else Do You See?

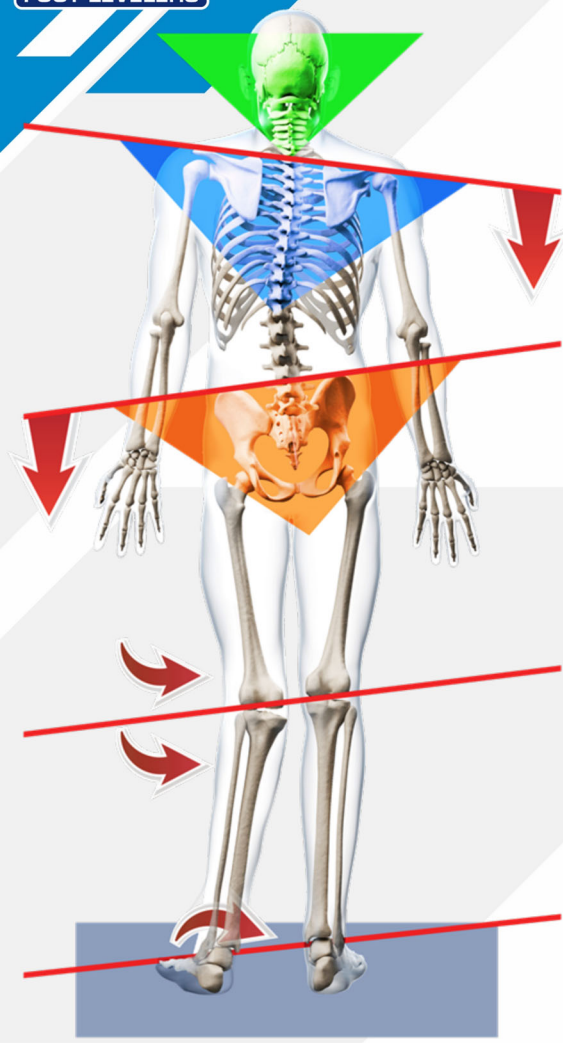






FOOT LEVELERS

Don’t Overlook the Lower Extremities!



FOOT LEVELERS

EVERY DAY YOU PUT A LOT OF STRESS ON YOUR FEET

7,500
STEPS

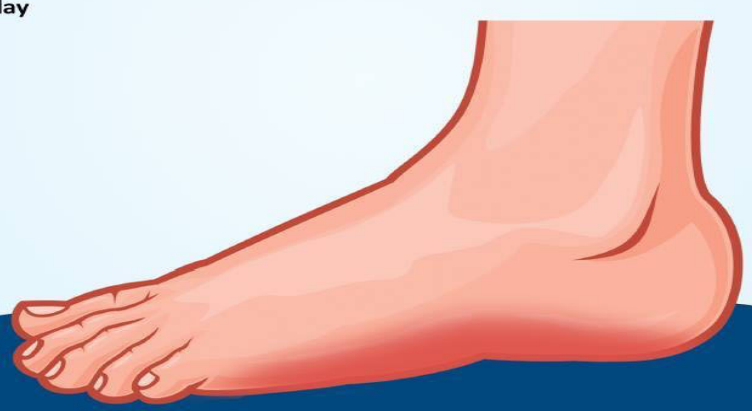
The average number of steps a person takes a day

26,000
POUNDS

Total force your feet absorb in a typical day

100,000
MILES

The number of miles the average person walks in a lifetime

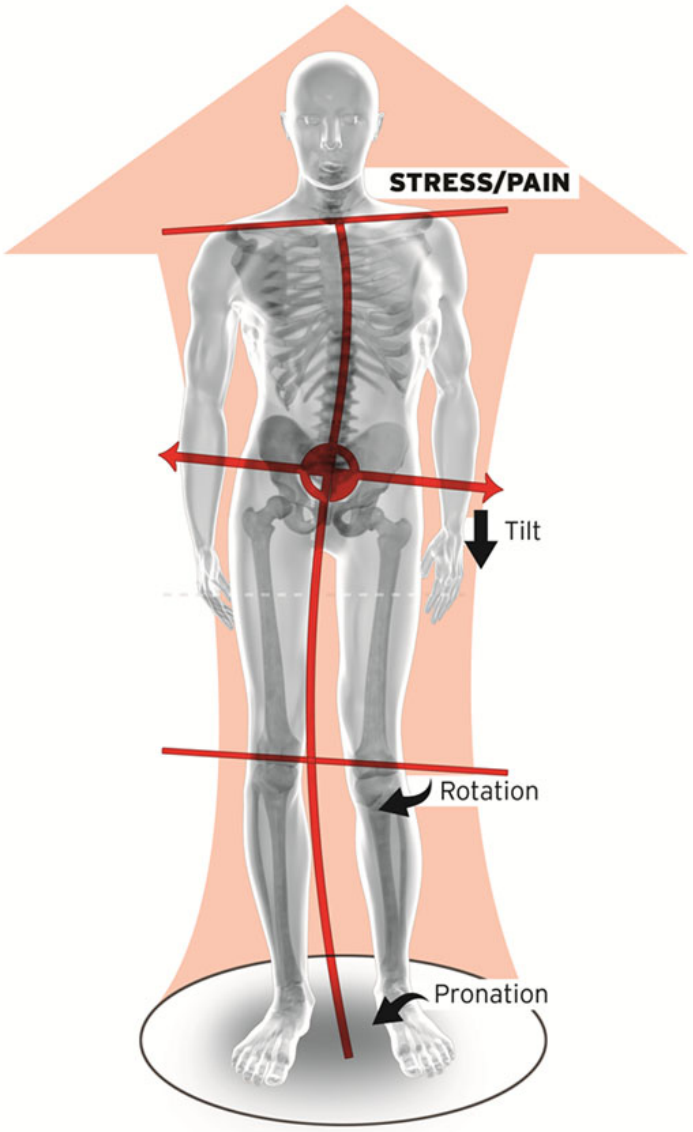


Research shows low back pain, knee pain, hip pain, and ankle pain are often related to foot problems. Make sure you keep your feet healthy by exercising, wearing good shoes and rotating them, and using custom orthotics to provide a balanced foundation.

FOOT LEVELERS

OVER-PRONATION EFFECTS

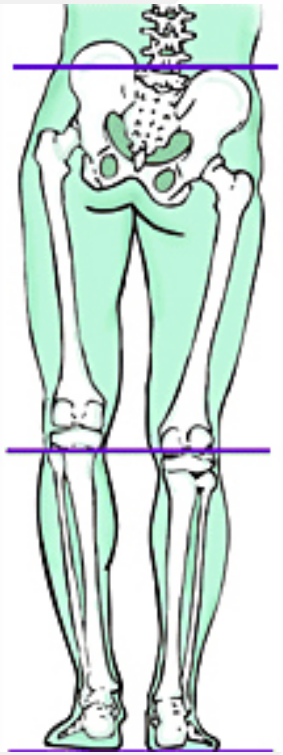
- Excessive spinal rotational stress
- Chronic SI joint stress

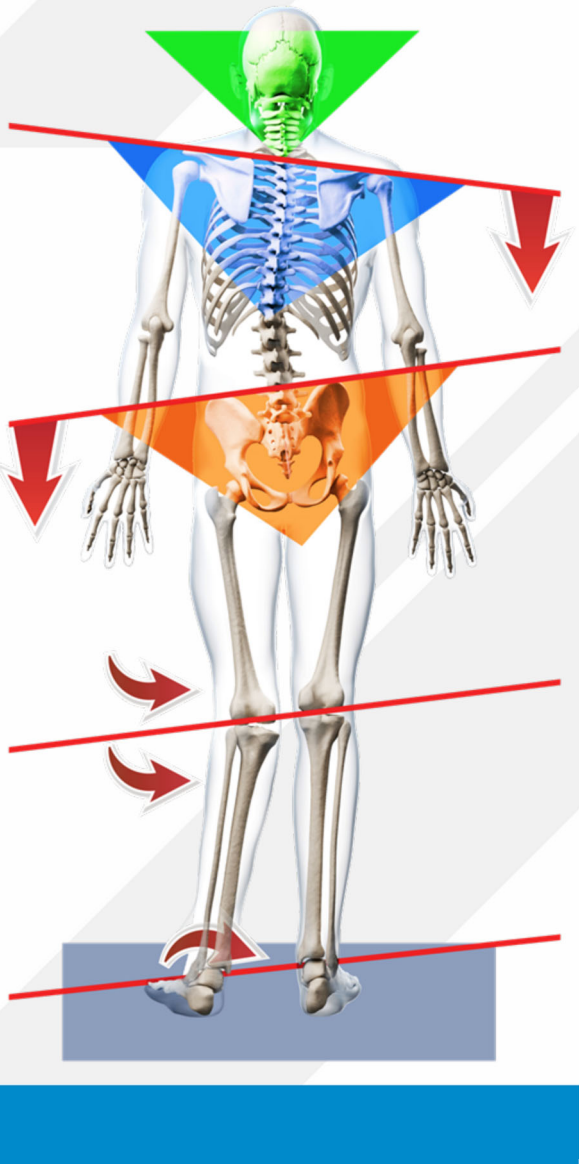


FOOT LEVELERS

OVER-PRONATION EFFECTS

- Excessive shock transmission
- Pelvic unleveling due to LLI





Excessive Pronation

- Structural Causes:
  - Foot, Ankle, Knee, Hip, Pelvis, Spine
  - Leg Length Inequality
    - Functional vs Anatomical
  - Post Traumatic

FOOT LEVELERS

WHEN THE FOOT HITS THE GROUND, **EVERYTHING CHANGES**

Factors of Pronation

FOOT LEVELERS

FOOT LEVELERS

SX'S OF EXCESSIVE PRONATION

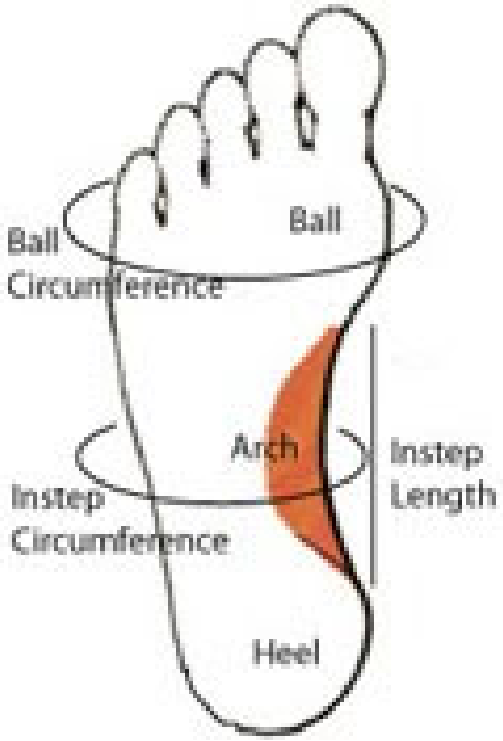
- History or chronicity of symptoms
- Spinal/extremity symptoms worse with WB
- Short-term response to Chiro.

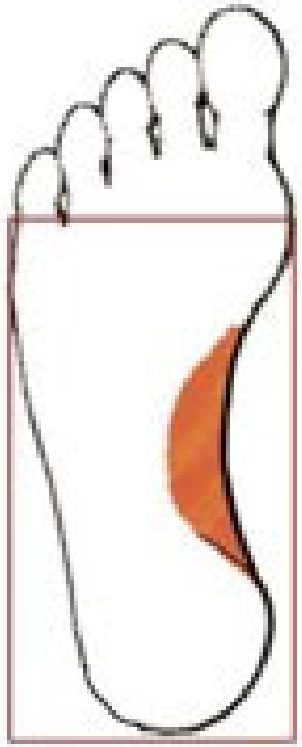
FOOT LEVELERS

HOW DO THE GENDERS DIFFER?

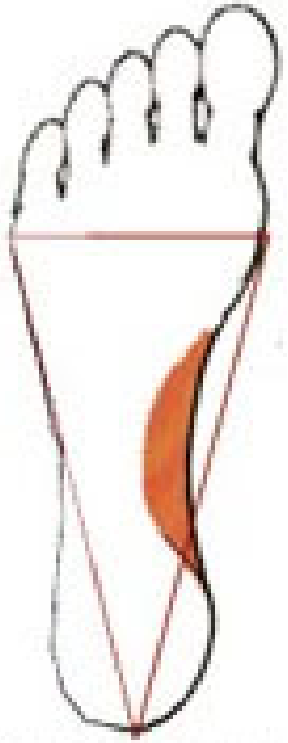
Narrower heel/midfoot with a wider forefoot

Biomechanical forces are distributed differently!





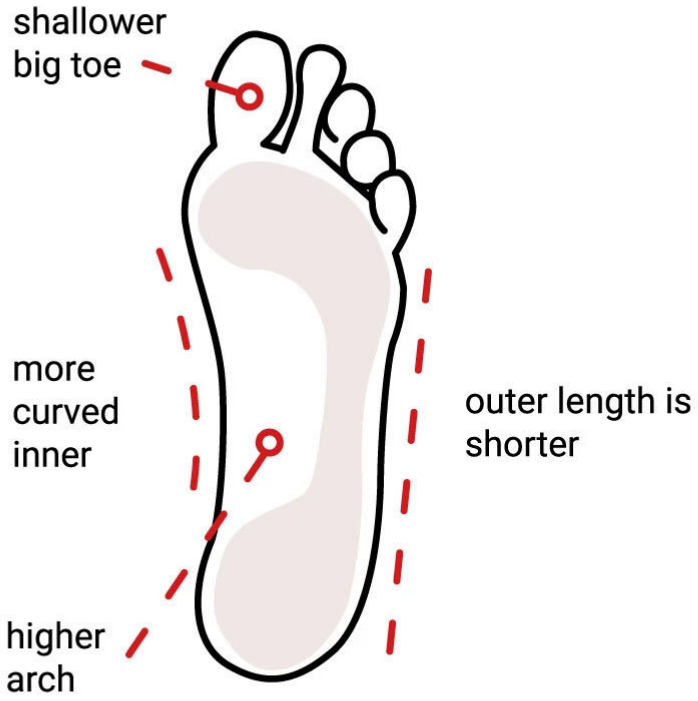
Male Feet have a "Square" shape



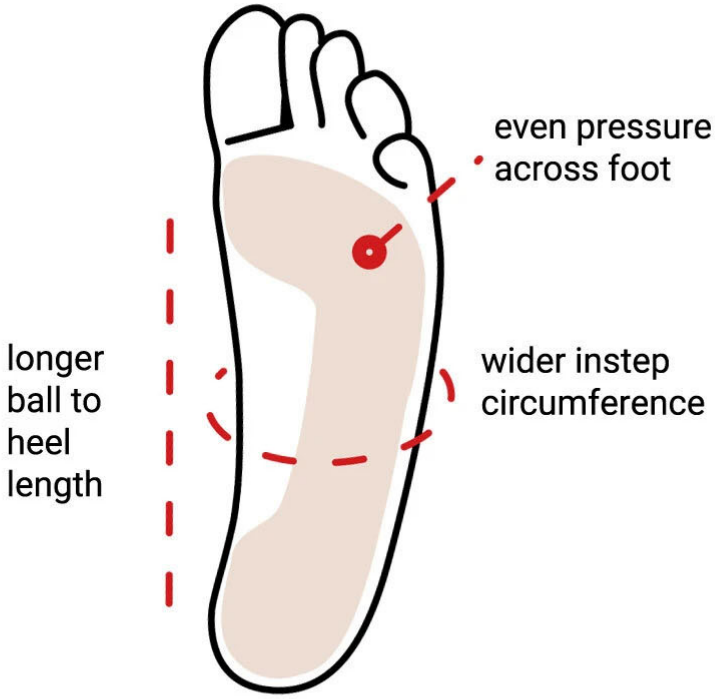
Female Feet have a "Triangle" shape

Gender Differences

Women's feet are smaller for a given body height



female



male

FOOT LEVELERS

Are Female Feet Different?

Biomechanical, forefoot conditions in women > men

(Bunions, hammer toes, calluses, neuromas, metatarsalgia)

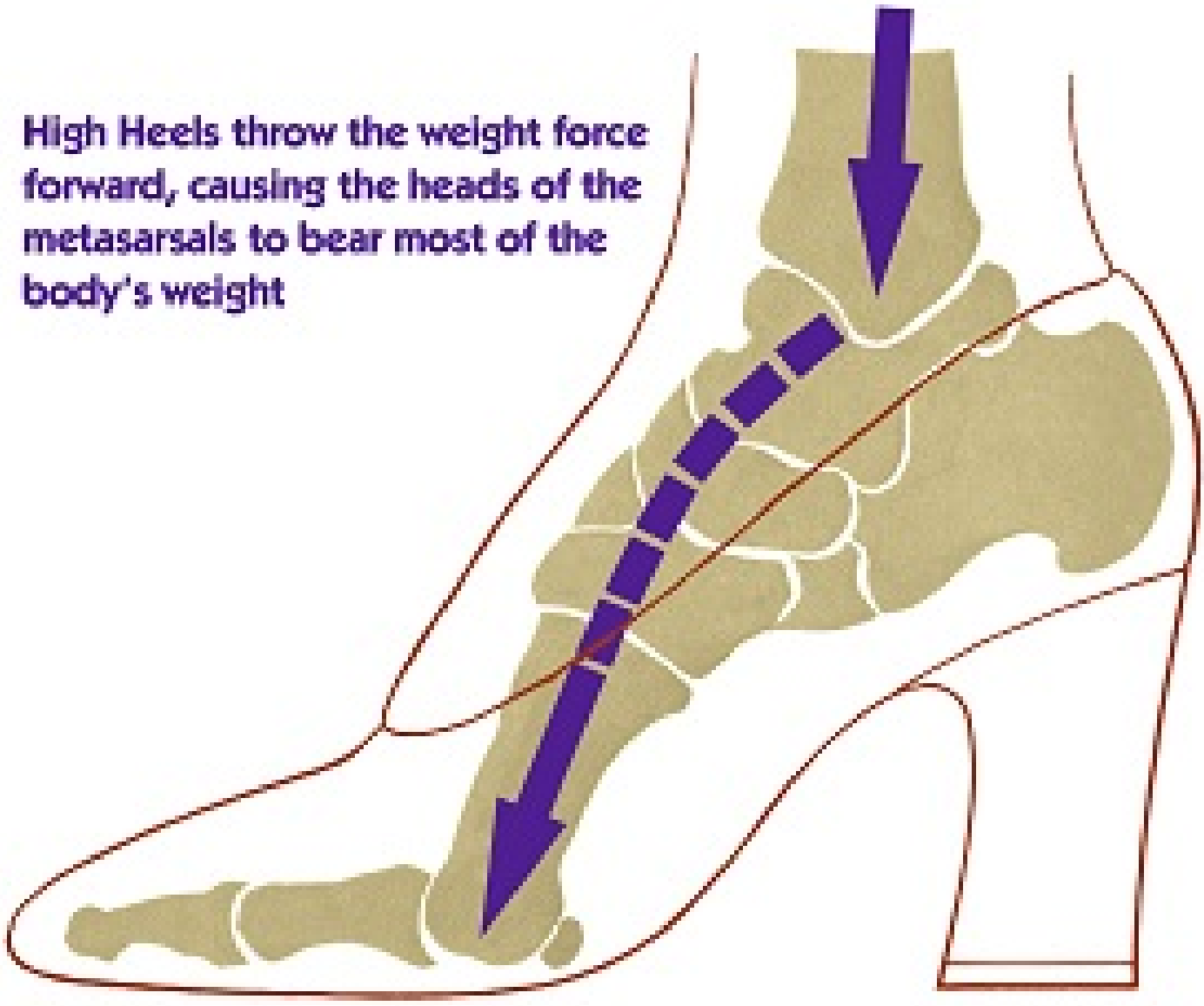
- **MT arch support is key!**

Footwear

- People cram feet into shoes that don't fit.
- Many don't update their shoe size as they age.
- Trace each foot while standing then trace the shoe. Any significant discrepancy means foot is cramped when standing and restricted during gait.

FOOT LEVELERS

High Heels throw the weight force forward, causing the heads of the metasarsals to bear most of the body's weight

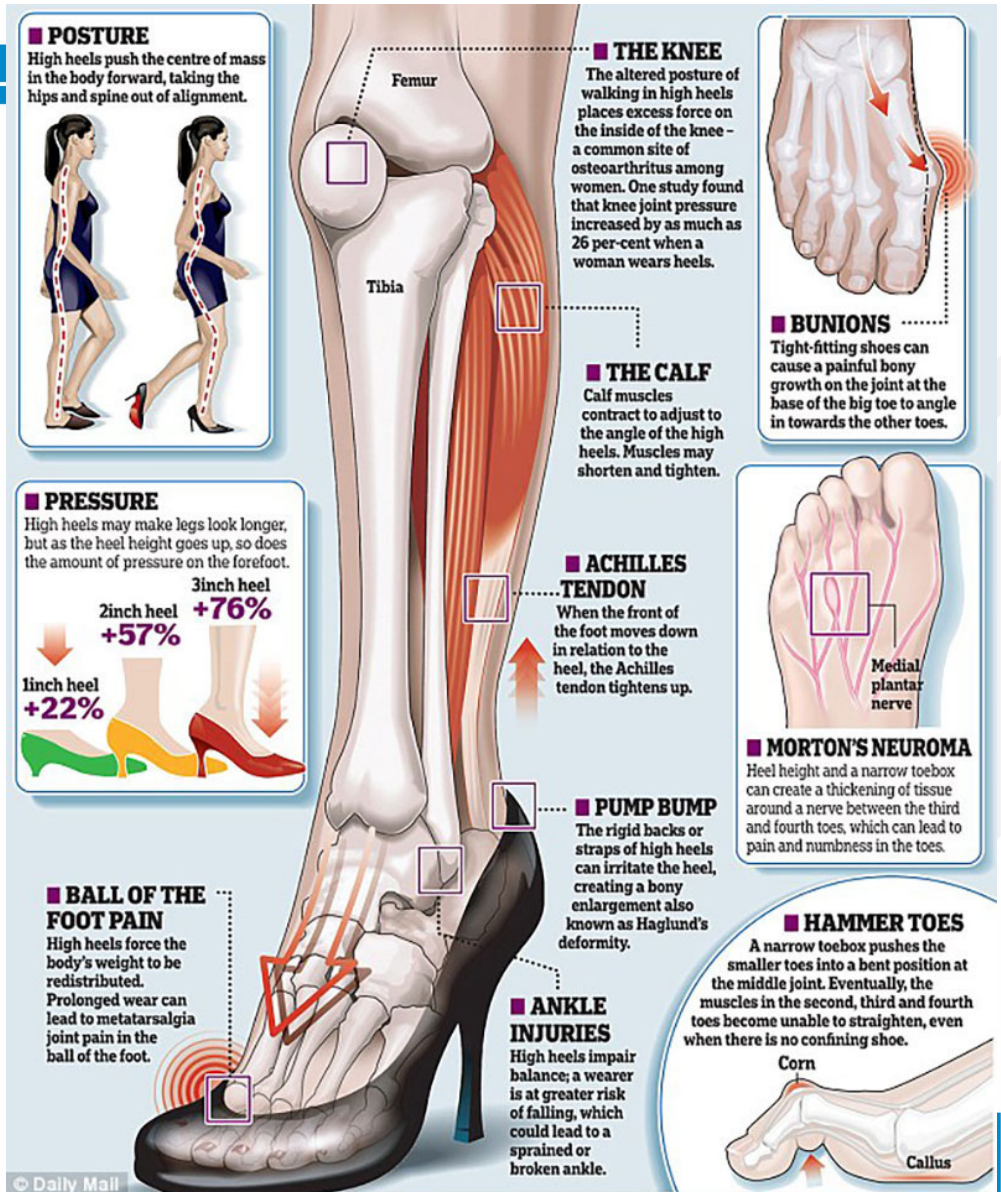



R
JAG

Dangers of Heels

Forefoot pressure increases by:

1 inch heel - 22%
2 inch heel - 57%
3 inch heel - 76%



FOOT LEVELERS

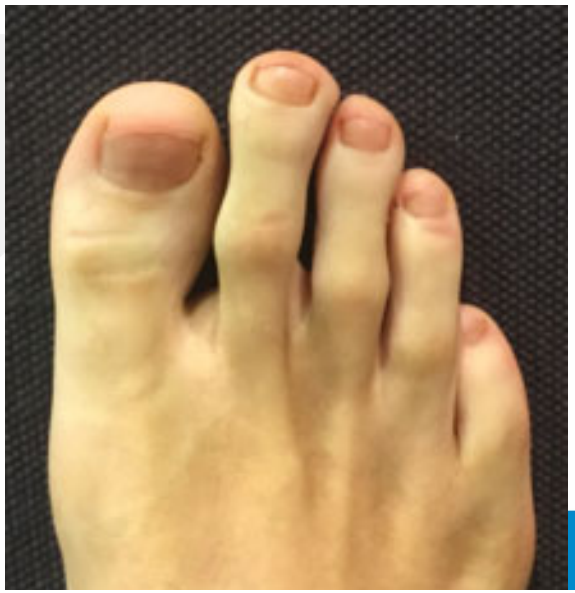
VISUAL/PALPATORY FINDINGS

- Corns
- Bunions
- Callouses
- Hammer toes
- Hallux Valgus

FOOT LEVELERS

VISUAL FINDINGS

- Collapsed arches
- Morton's Foot
- Past foot/ankle injuries
- Fat/callous pads under arches



WHAT IS A BUNION?

A **bunion** is a bony bump on the inside of the big toe.

A **bunionette** or **"tailor's bunion"** forms on the outside base of the little toe.

1/3

of U.S. adults will develop bunions.

10x

Women are 10 times more likely as men to have bunions.

Risk factors:

- Arthritis
- Genetics
- Trauma
- Pregnancy
- Overpronation (flat feet)
- Unhealthy foot alignment

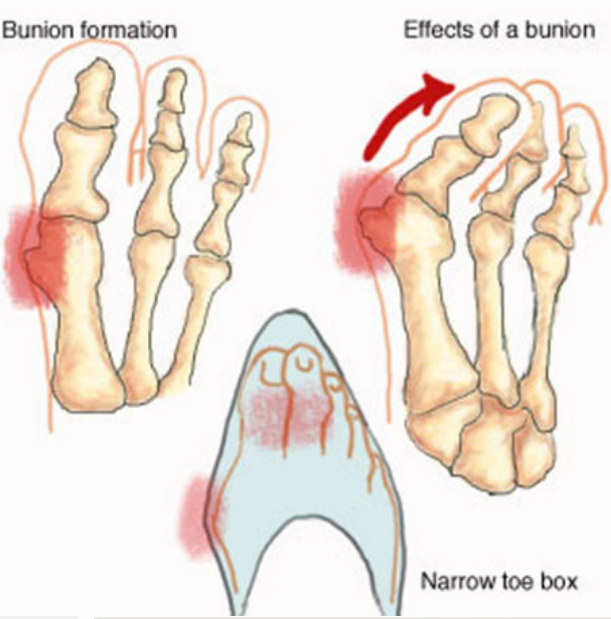
Shoes styles that contribute to bunions:

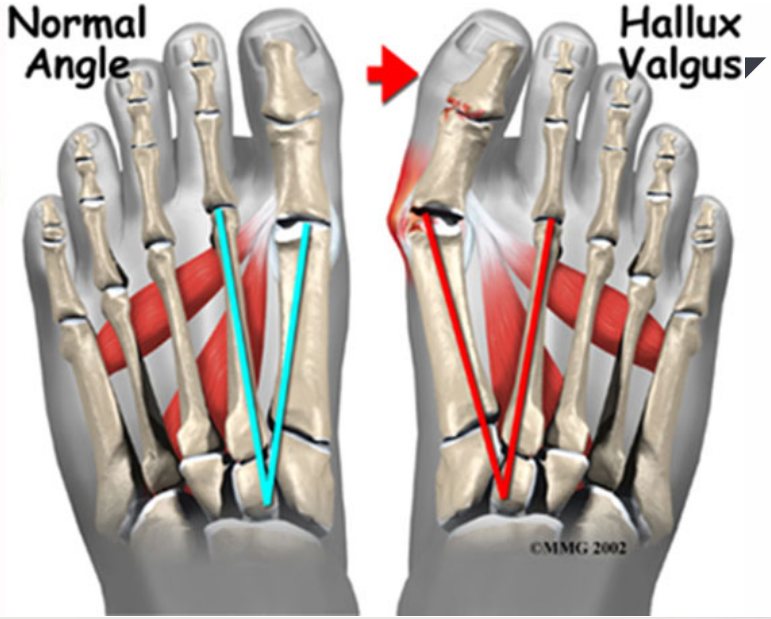
Pointed toes

Shoes that are too small or narrow

High heels (3 inches or more)

Once formed, bunions don't go away on their own. They can modify the way you walk, causing biomechanical issues in other parts of the body. This can lead to pain and increase your risk for injury.

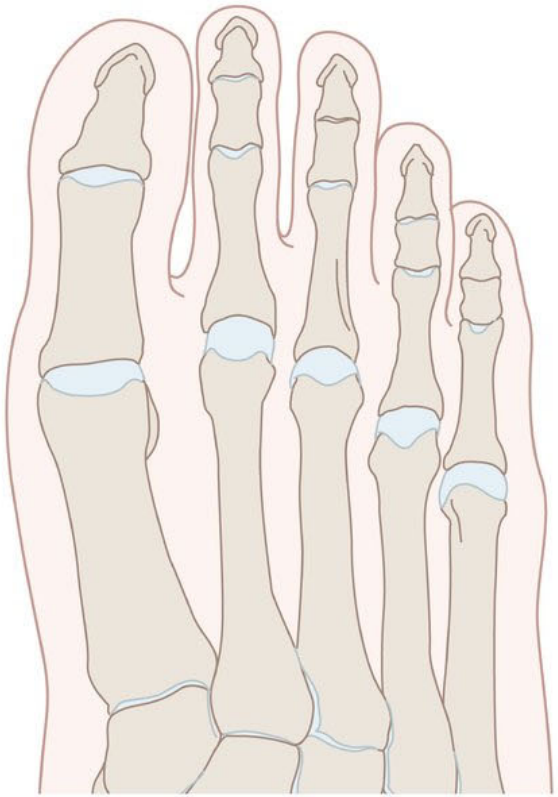

Bunion formation
Effects of a bunion
Narrow toe box


Normal Angle
Hallux Valgus
©MMG 2002

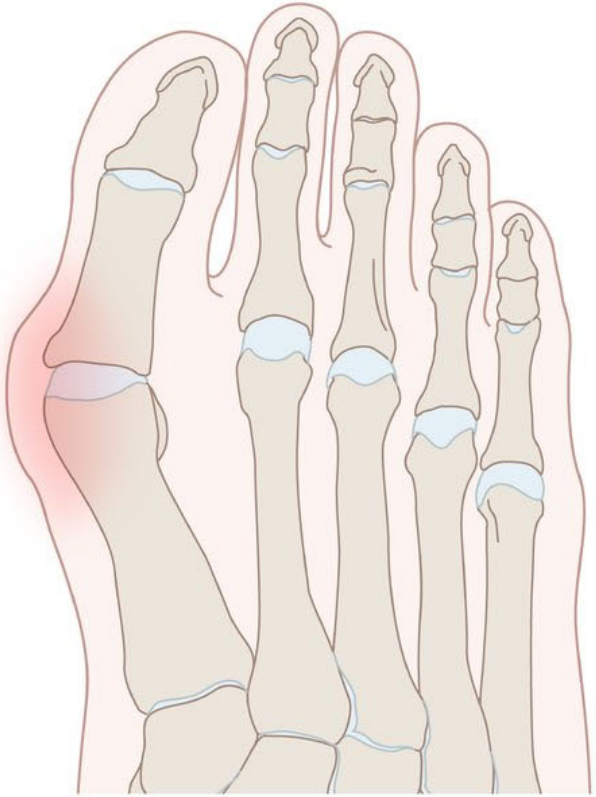

Structural Bunion
Rotated Toe
Displaced Sesamoid Bones
Tailor's Bunion


MILD
MODERATE
LARGE
SEVERE

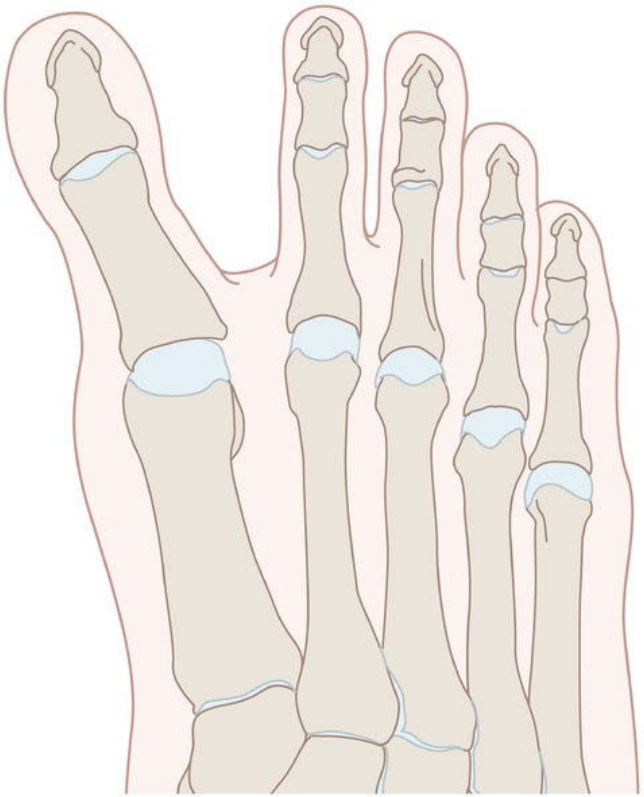
Hallux Deformities



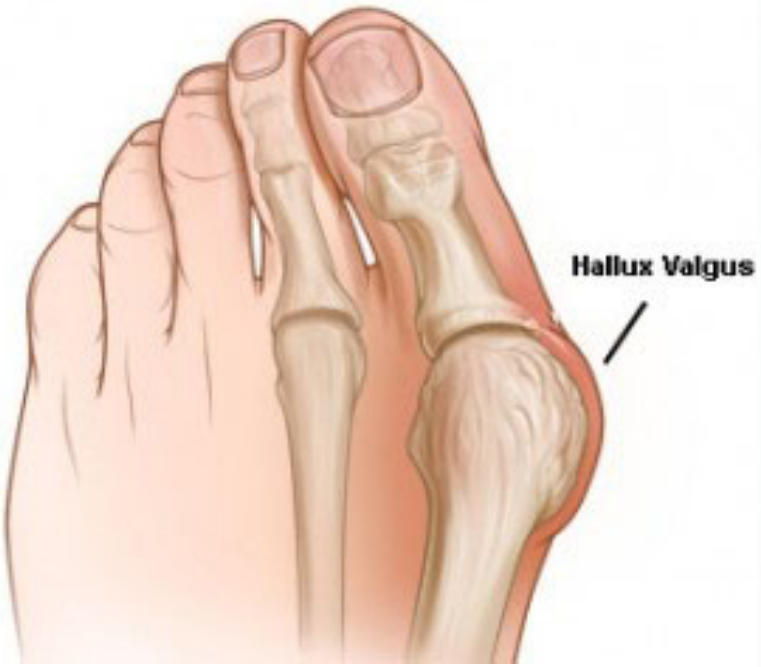
Normal



Hallux valgus



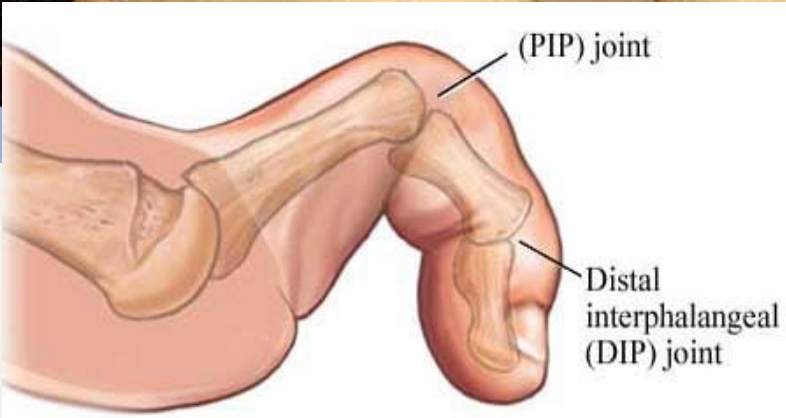
Hallux varus

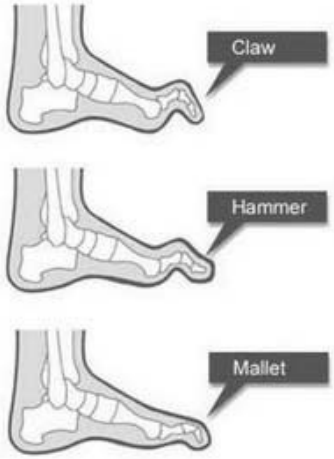

Hallux Valgus


A

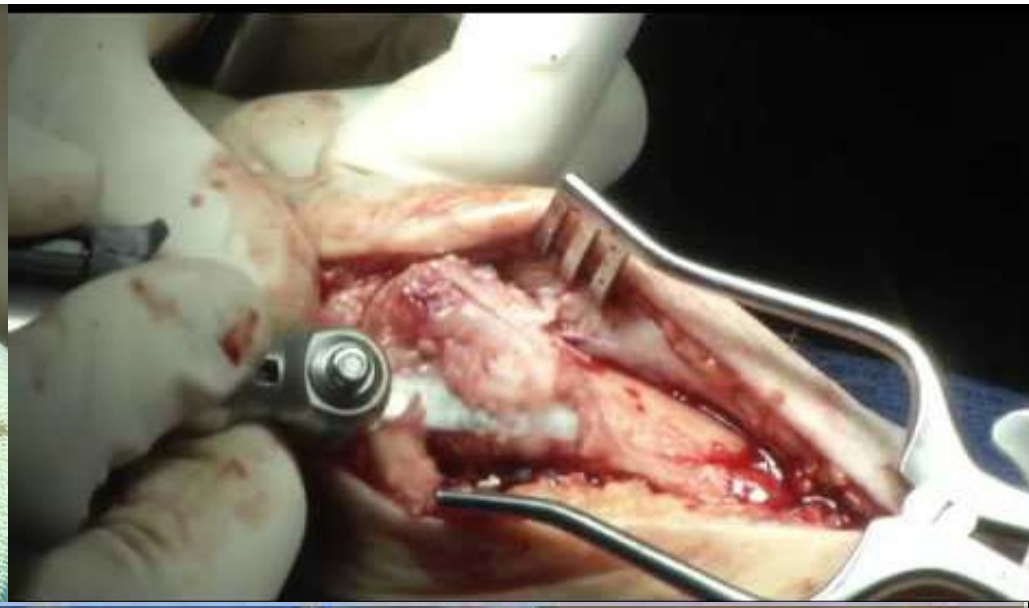

B

HAMMER TOES


(PIP) joint
Distal interphalangeal (DIP) joint

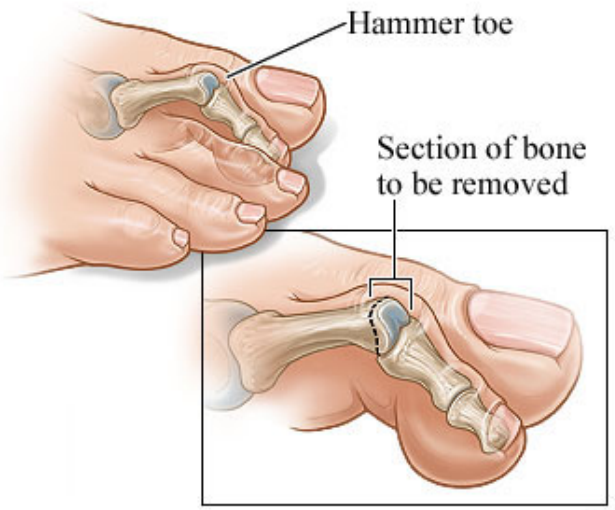

Claw
Hammer
Mallet


TIMONIUM
FOOT AND ANKLE CENTER



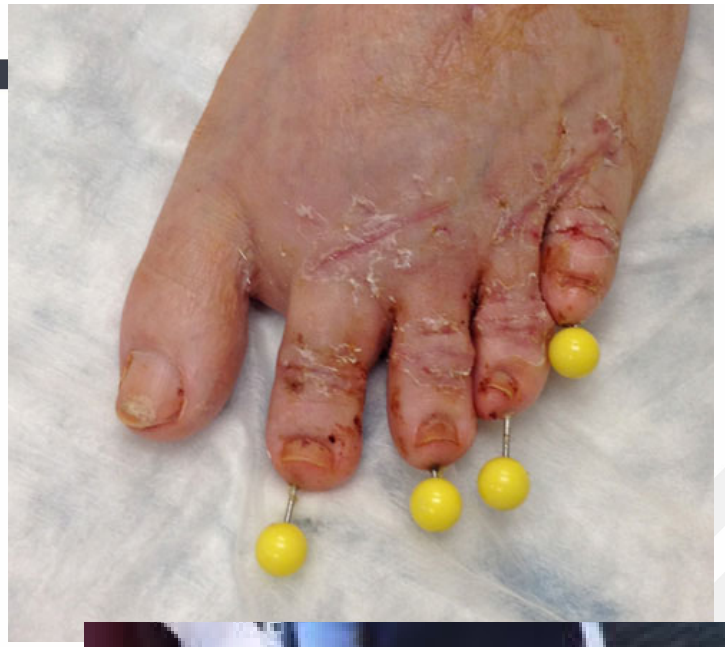

stryker

FOOT LEVELERS

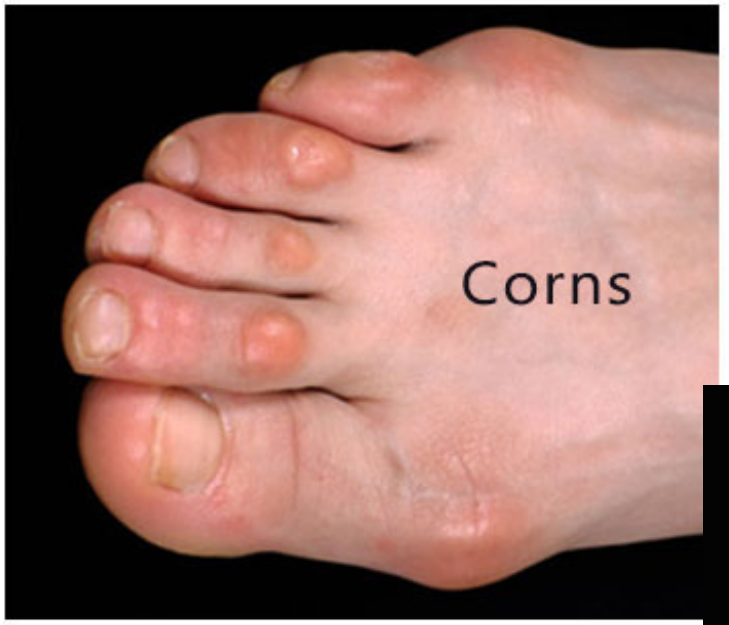


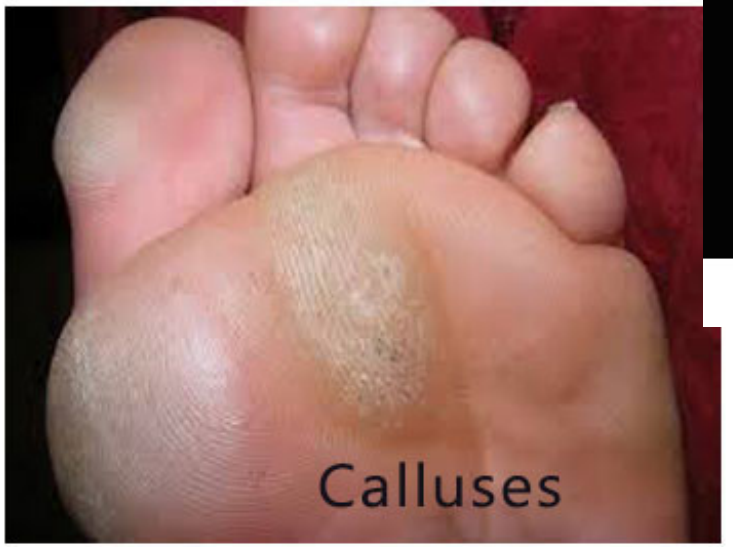
This postoperative X-ray depicts a bunionectomy and crossover second hammertoe repair using a traditional percutaneous Kirschner wire.


2) Three days after Surgery. Note the metal pins with white colored pin caps.

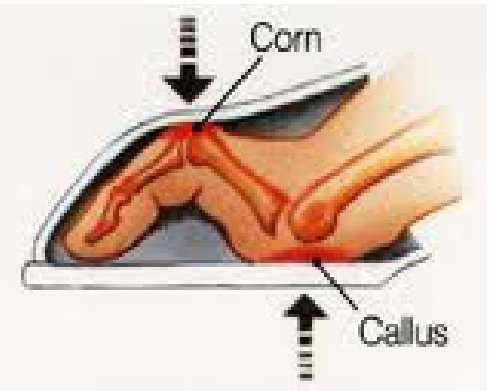


FOOT LEVELERS





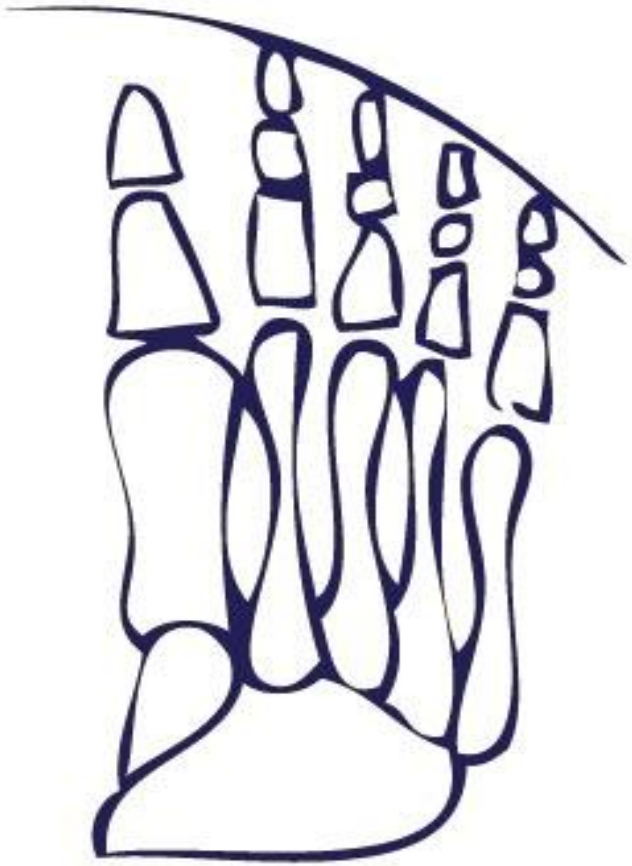
CORNS **CALLUSES**



3 PRIMARY FOOT TYPES IN NORTH AMERICA

SQUARED FOOT 9%

MORTON'S FOOT 22%



EGYPTIAN FOOT 69%

FOOT LEVELERS

MORTON'S FOOT/TOE

FOOT LEVELERS

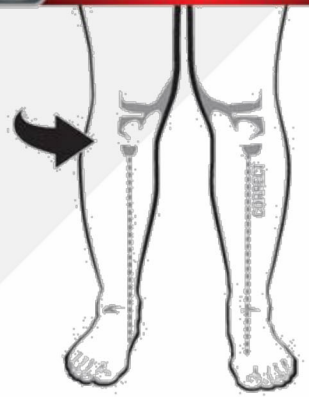
HAMMER TOES

FOOT LEVELERS

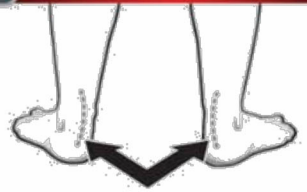
5 RED FLAGS OF PRONATION

1 Foot Flare During Gait

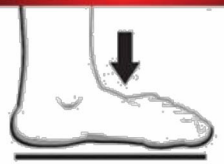
2 Internal Knee Rotation



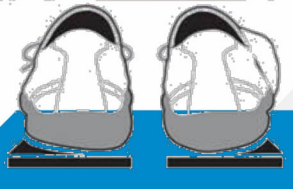
3 Bowed Achilles Tendon

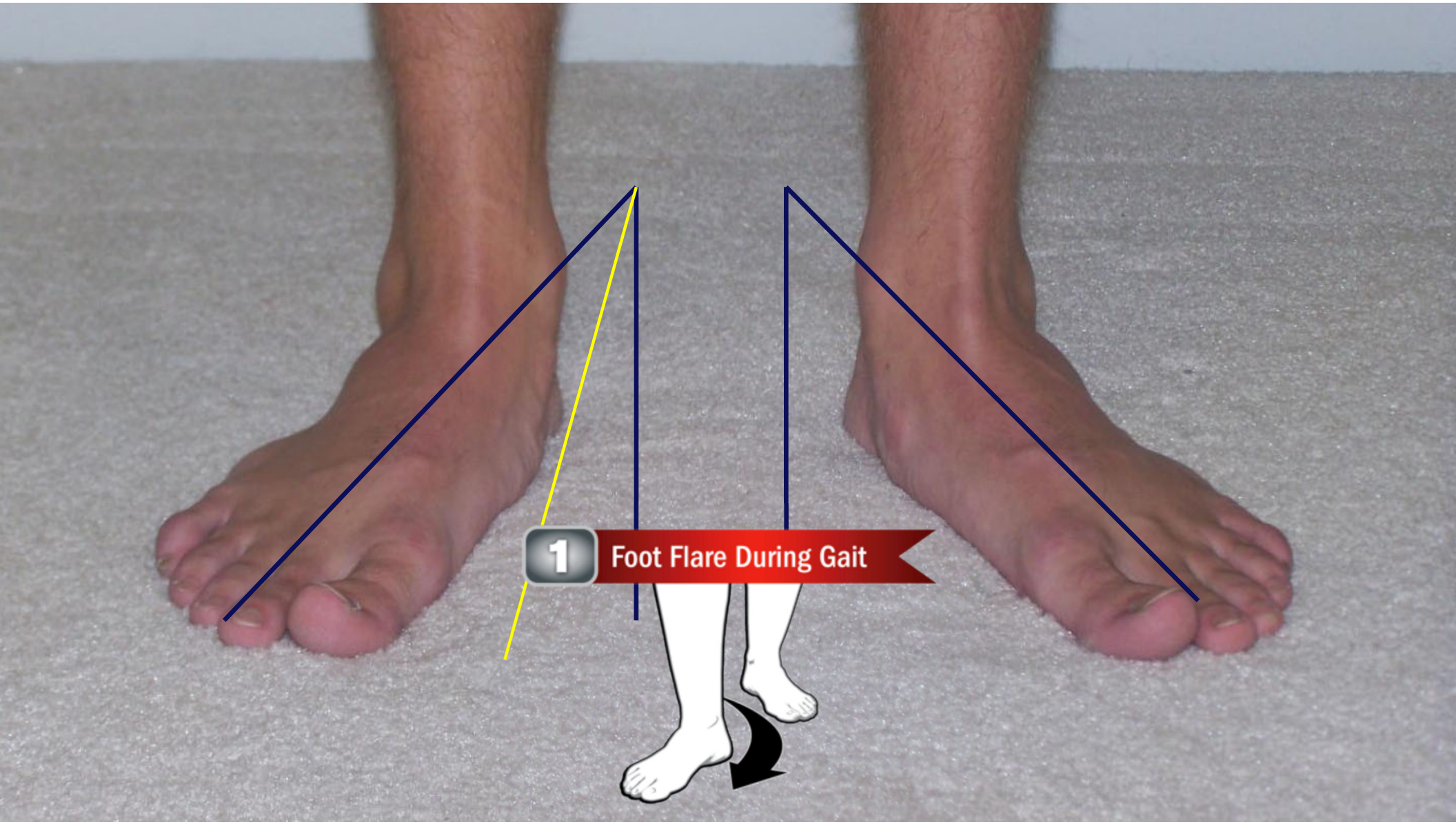


4 Flat Foot

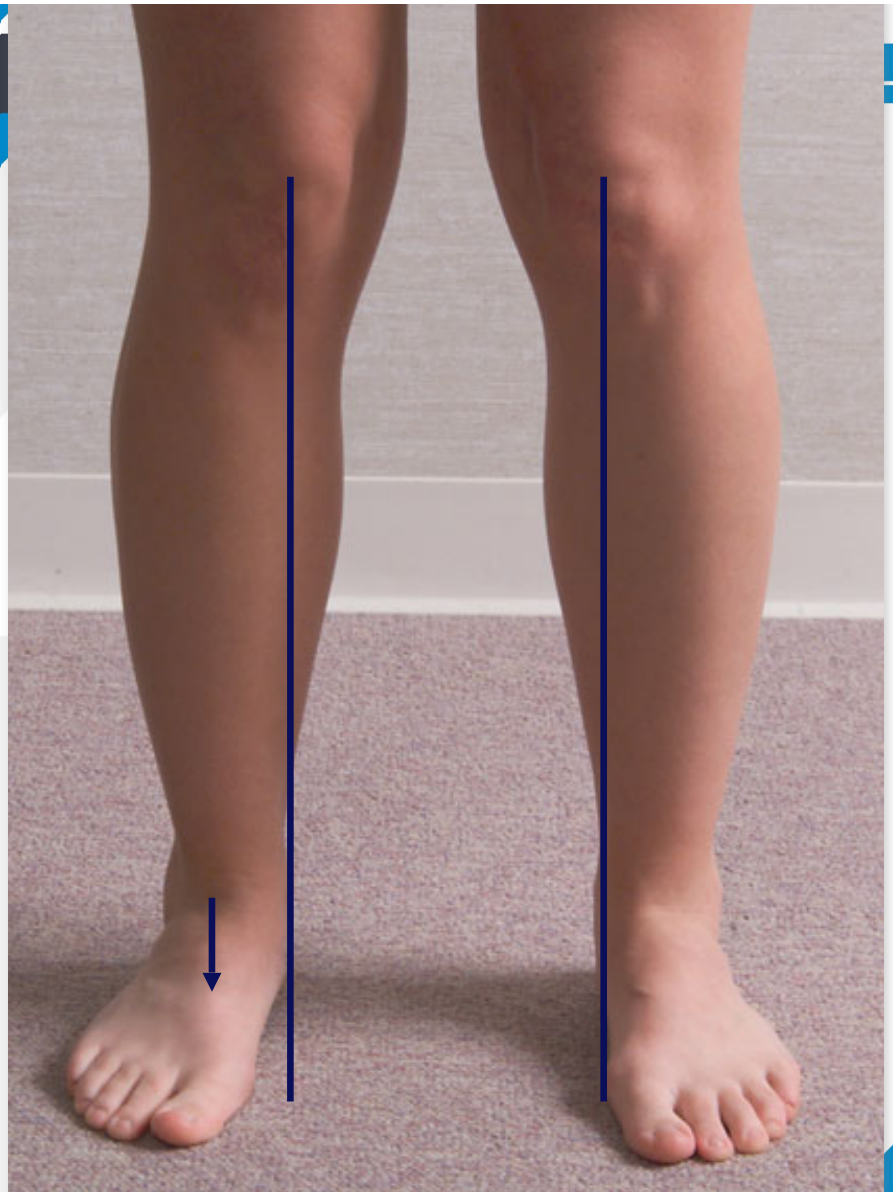


5 Uneven Shoe Wear

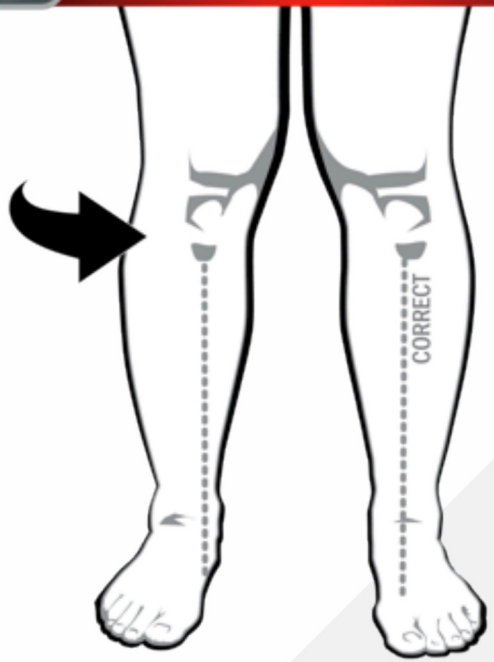


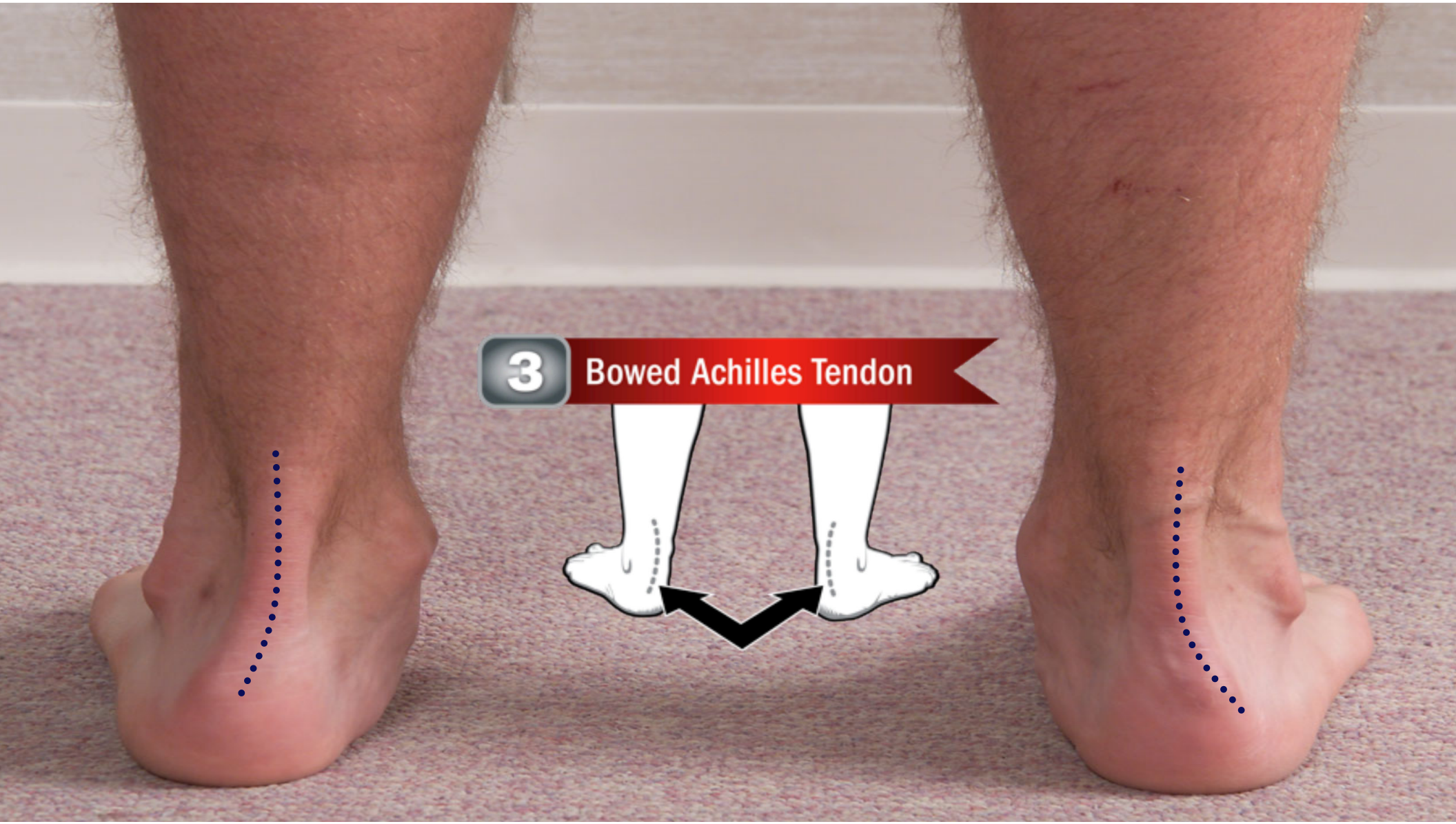

1
Foot Flare During Gait

FOOT LEVELERS



2 Internal Knee Rotation




3
Bowed Achilles Tendon

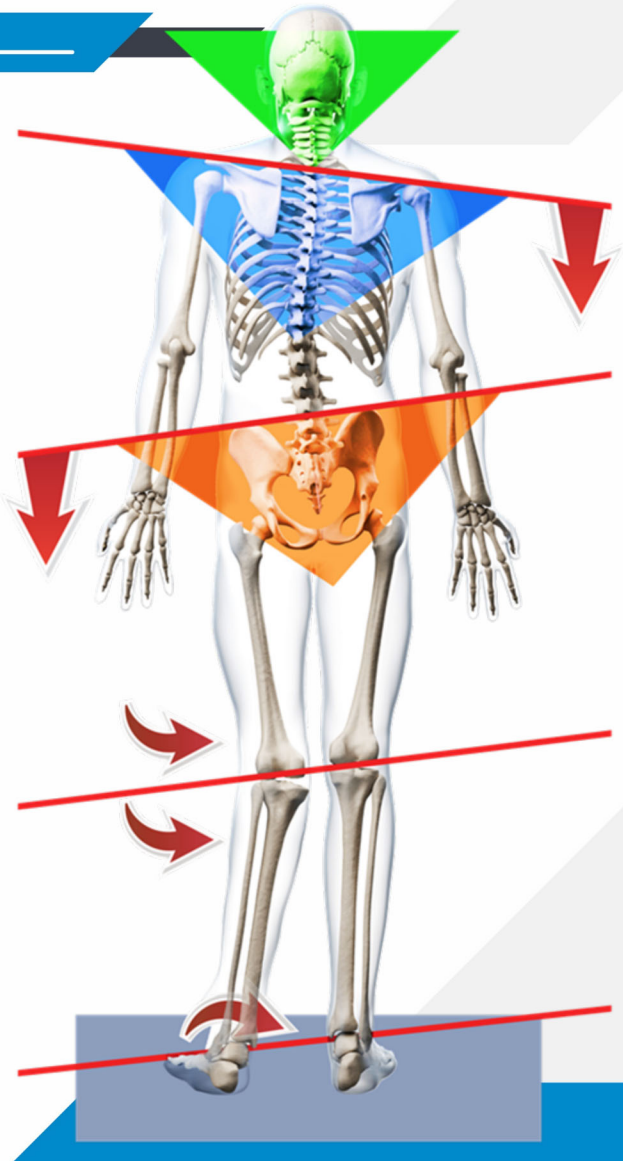
FOOT LEVELERS


5
Uneven Shoe Wear

FOOT LEVELERS

FOOT LEVELERS

Structural stress produces muscle imbalances



BEFORE
FULL BODY PAIN

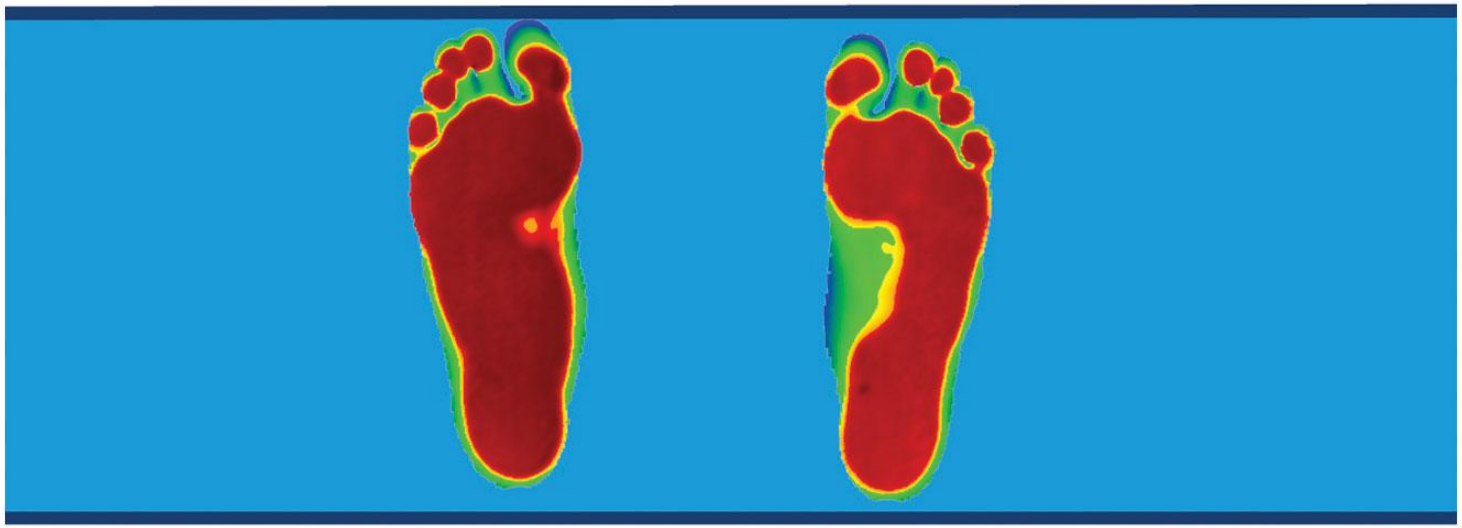
FUNCTIONAL ORTHOTICS

AFTER
FULL BODY RELIEF

Without functional orthotics flat feet aren't supported

With functional orthotics flat feet are supported

SAME PERSON
DIFFERENT FEET



Scanning the feet shows immediately
asymmetrical overpronation

Who Can Benefit from orthotics?

SCAN EVERY PATIENT!

MAKE THIS YOUR PROTOCOL

WHY?? → Various studies show **overpronation creates biomechanical dysfunction**

↘ it's an educational opportunity to show patients **the feet play an instrumental part in the care you provide**

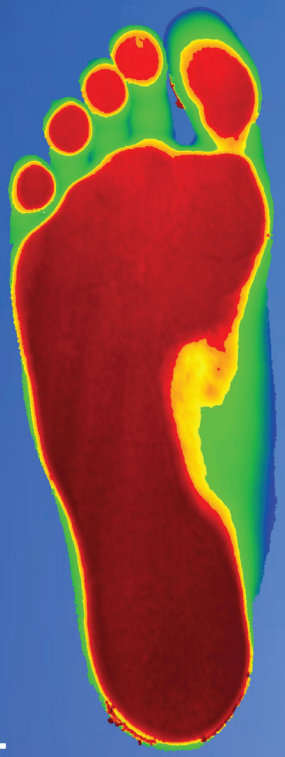
Scan Every Patient

- 77% of people suffer from moderate to severe pronation [1]
- 90% have some degree of leg length inequality [2]
- Back pain is the #2 cause of work-related disability in the U.S. [3]
- 80% of people will experience some sort of back pain in their lifetime [4]

1 – "77% of Participants Improve Body Balance with Stabilizer." John Hyland, DC, MPH DABCR, DABCO, CSCS
2- NCBI: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1232860/
3 – CDC: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5816a2.htm
4 –NCBI: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4339077/

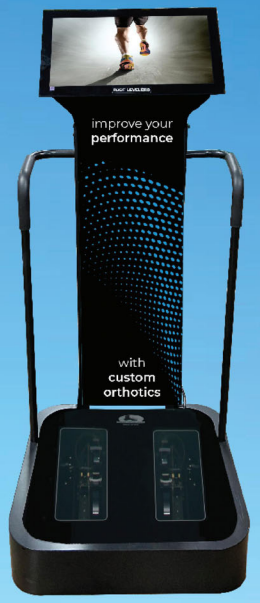
SCAN
EVERY PATIENT

- 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**



77% of patients had improved balance with Foot Levelers custom orthotics

"77% of Participants Improve Body Balance with Stabilizer."
John Hyland, DC, MPH DABCR, DABCO, CSCS



EVERYONE NEEDS CUSTOM ORTHOTICS

MAKE SCANNING YOUR PROTOCOL

FOOT LEVELERS

The Foot Levelers Kiosk

Standard Design
Dual-Foot Kiosk

Ease Your Pain Design
Dual-Foot Kiosk

Spanish Design
Dual-Foot Kiosk

Performance Design
Dual-Foot Kiosk

Foot Levelers Kiosk

PROBLEM:

"I know I need to scan all of my patients but I don't always have time."

SOLUTION:

THE FOOT LEVELERS KIOSK
Your patients scan themselves!

https://vimeo.com/299742943

RESULTS:

- Improved Outcomes
- Happier, Healthier Patients
- Practice Growth

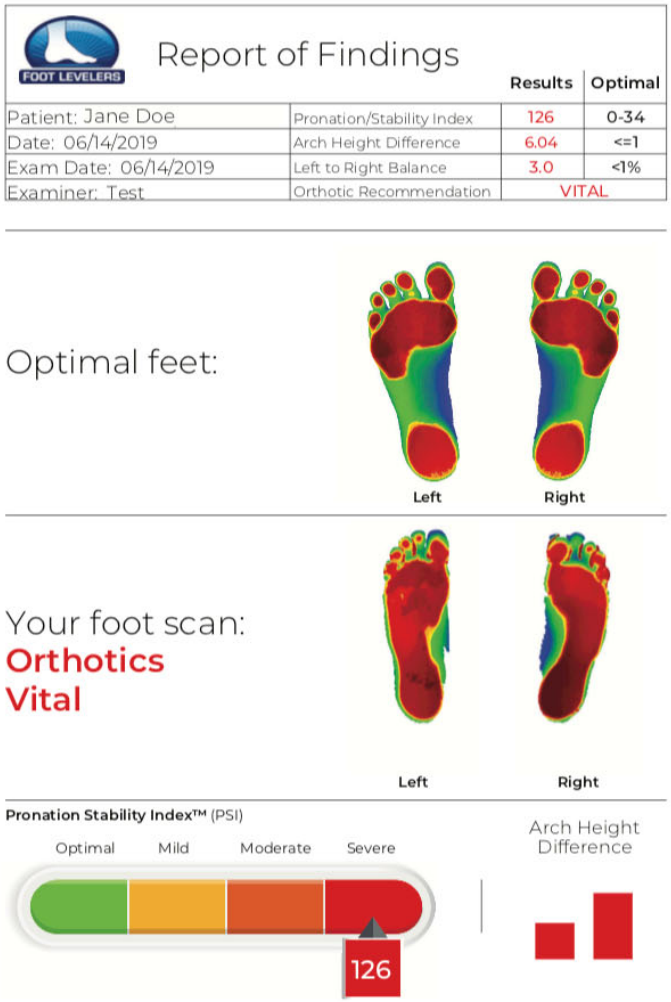
Foot Levelers Kiosk

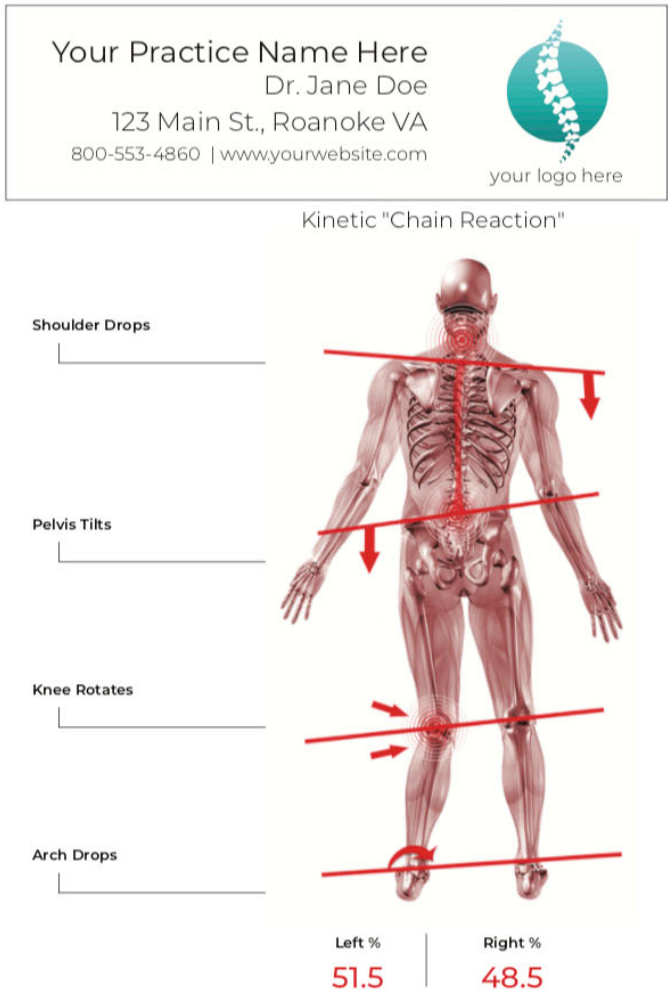
Our Best Scanning Technology

- **TIME SAVER** - Designed so patients can scan themselves
- **Referral tool**: Patients receive social media-ready scan results
- **Patient education:** Helps patients understand how problems in their feet could be the cause of their pain
- **Cloud-based**: Near-instant Report of Findings provides patient results. Streamlines the ordering process.

Report of Findings

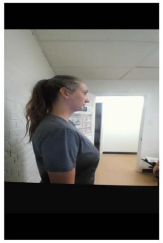
- Shows patient's scan next to Optimal feet
- Shows left-to-right balance and arch height difference
- Educates the patient on the Kinetic Chain and how custom orthotics can help
- Includes your logo and contact information

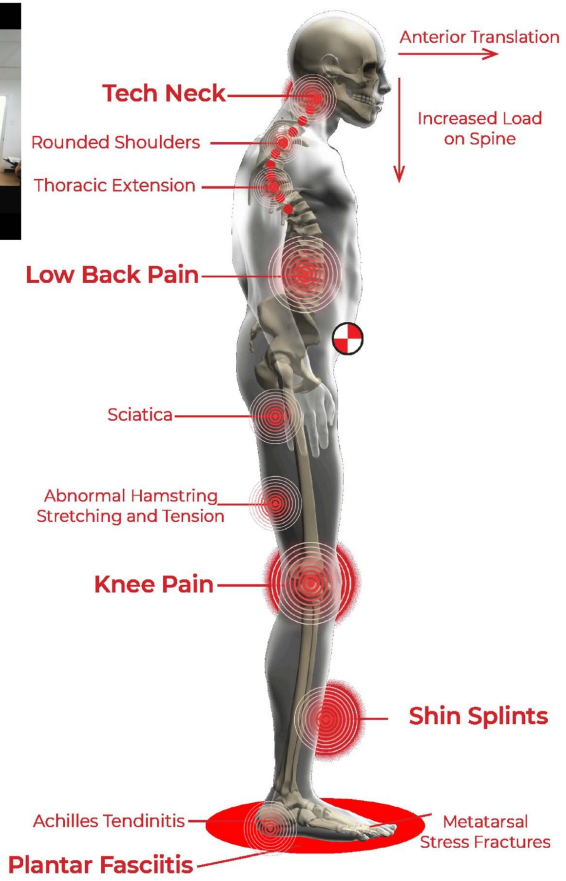




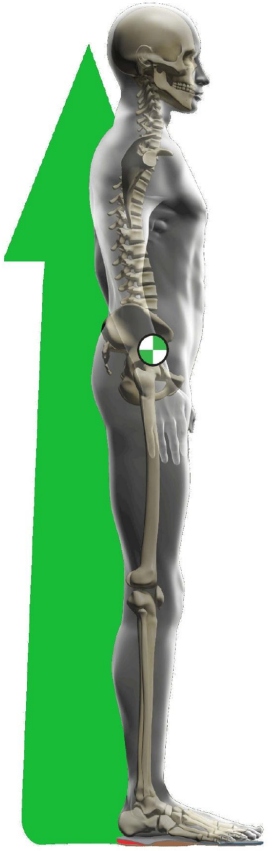
2nd Page of Report of Findings

Posture
(without orthotics)





Corrected Posture
(with orthotics)



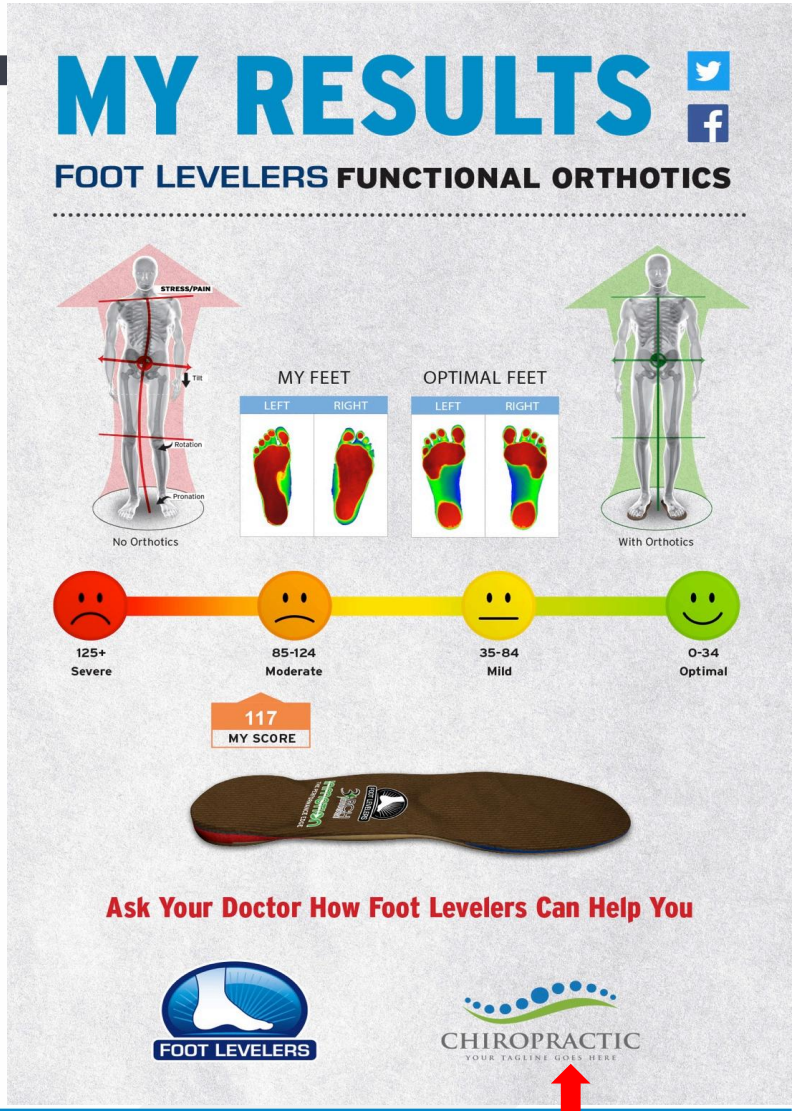
By stabilizing the feet, custom orthotics improve posture and help **reduce pain**

Based on your report, multiple pairs of custom orthotics are recommended

Shareable Patient ROF

After the scan, patients are emailed their own Report of Findings (ROF)

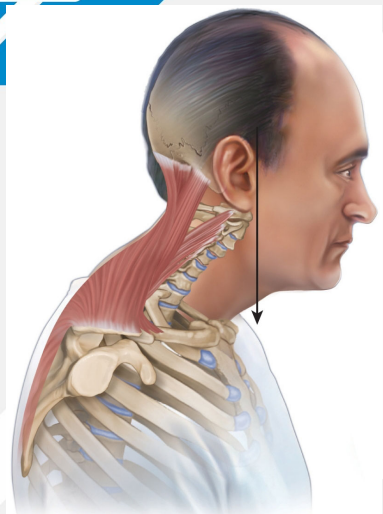
- Patient ROF is emailed before patient steps off scanner
- Shareable on social media – **REFERRALS!**
- Branded with your practice's logo and contact information
- Helps educate on the need and value of orthotics
- Shows PSI score

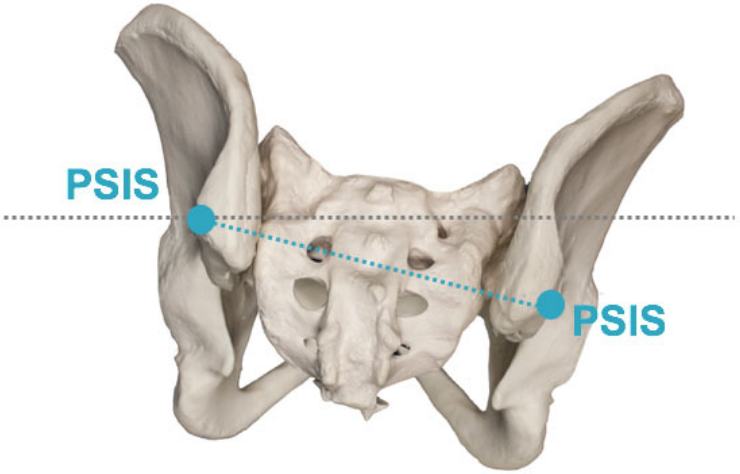


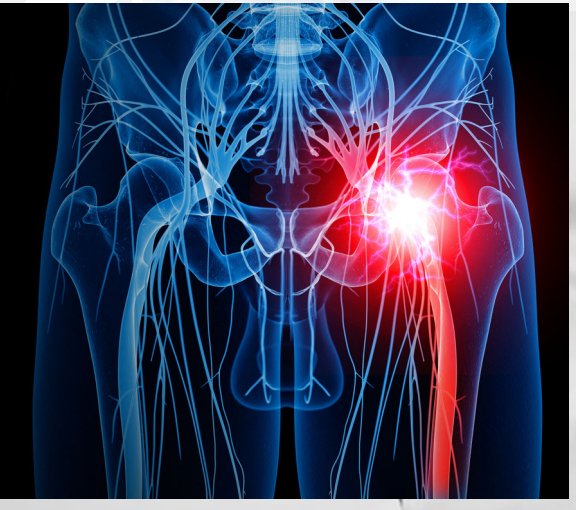
Your Logo Here

FOOT LEVELERS

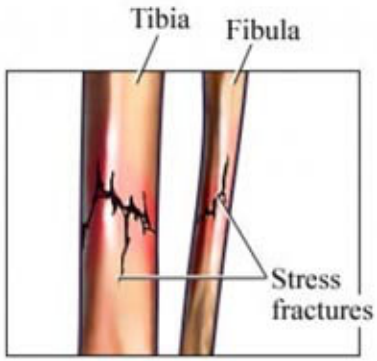
Consequences of EP

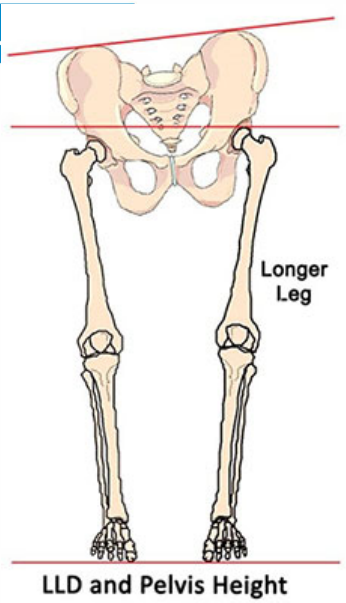




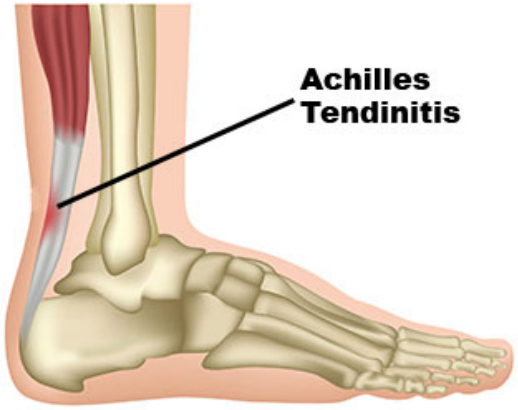


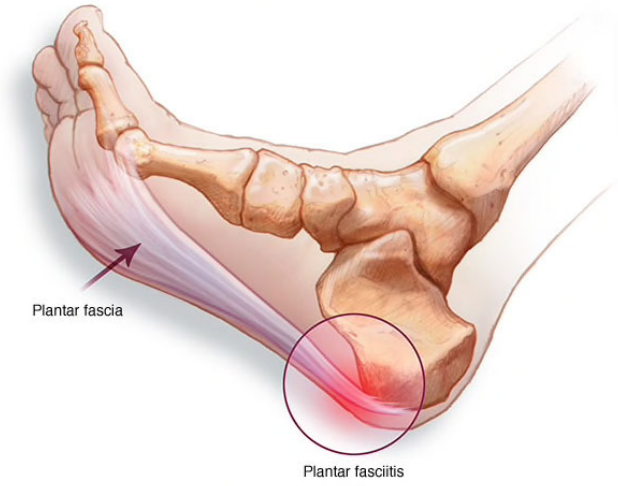
Consequences of EP



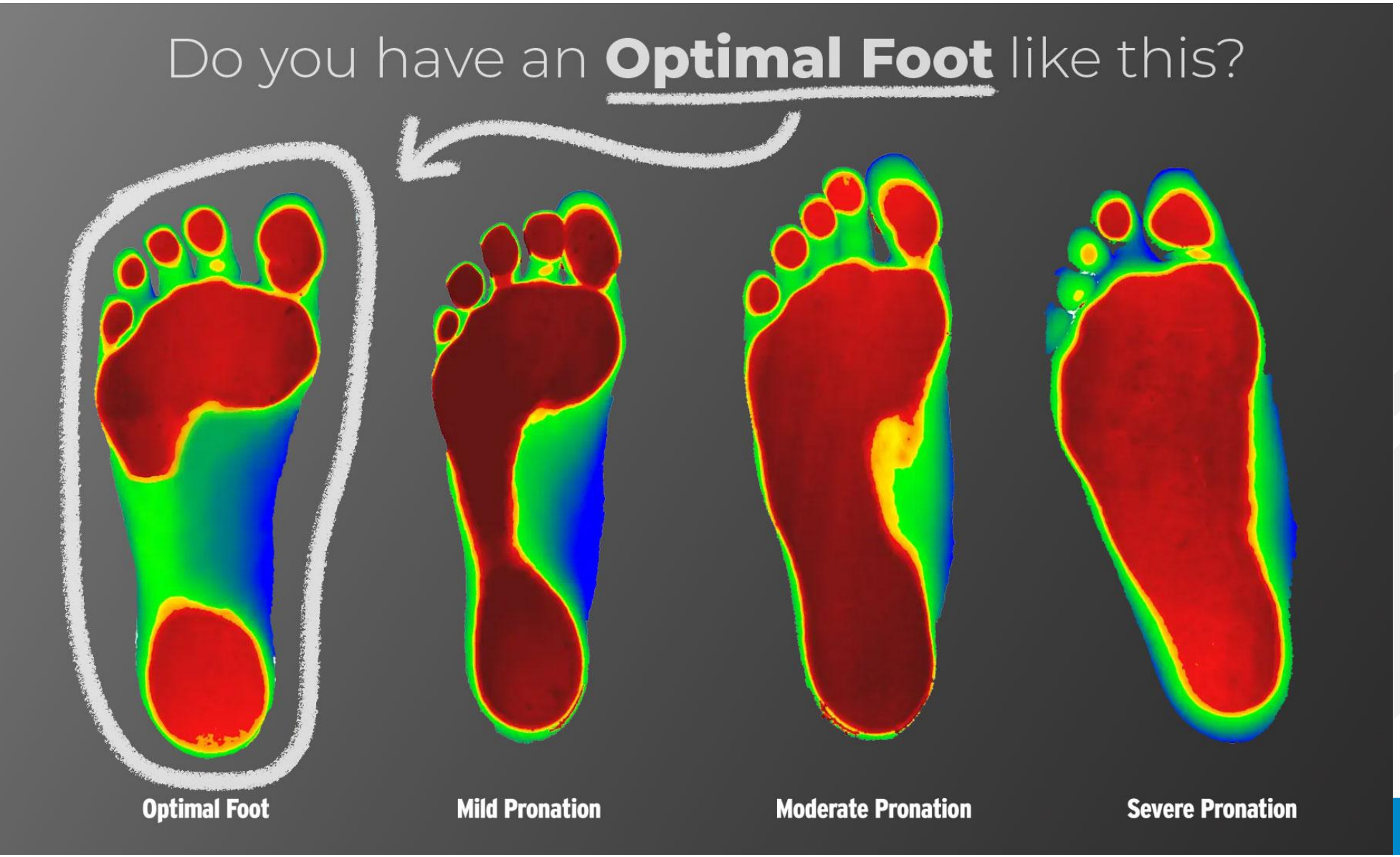


LLD and Pelvis Height





FOOT LEVELERS


Do you have an **Optimal Foot** like this?
Optimal Foot
Mild Pronation
Moderate Pronation
Severe Pronation

Prevalence of Excessive Pronation

8% **23%** **54%** **15%**

Sample Size: 445 patients

FOOT LEVELERS

Foot Imbalances Cause Serial Distortions

Medial Arch

Lateral Arch

Transverse Arch

SUPINATION

I- Excessive Pronation -I

Optimal Feet

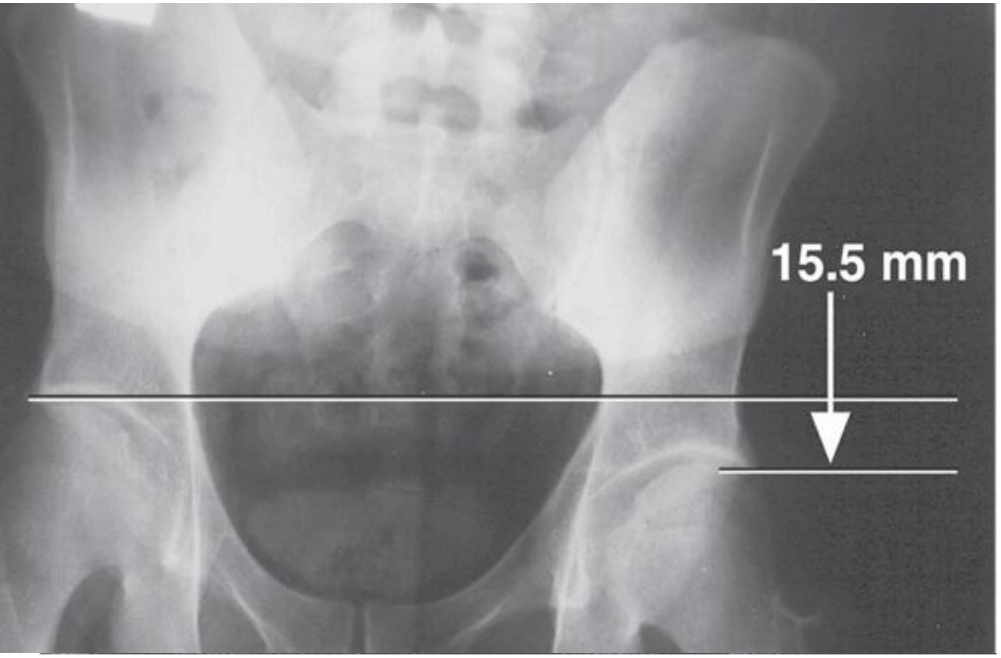
Custom orthotics help your feet perform like the Optimal Feet.

This reduces imbalances, **and helps prevent pain in other parts of the body**

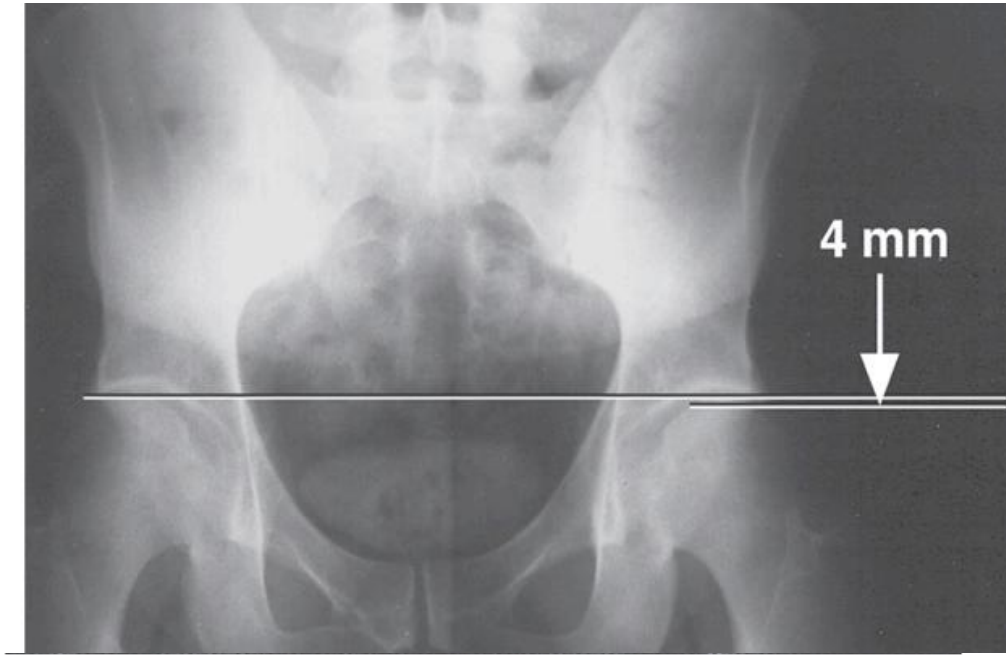
Over-pronated feet

Optimal Feet

Without Orthotics



With Foot Levelers Orthotics



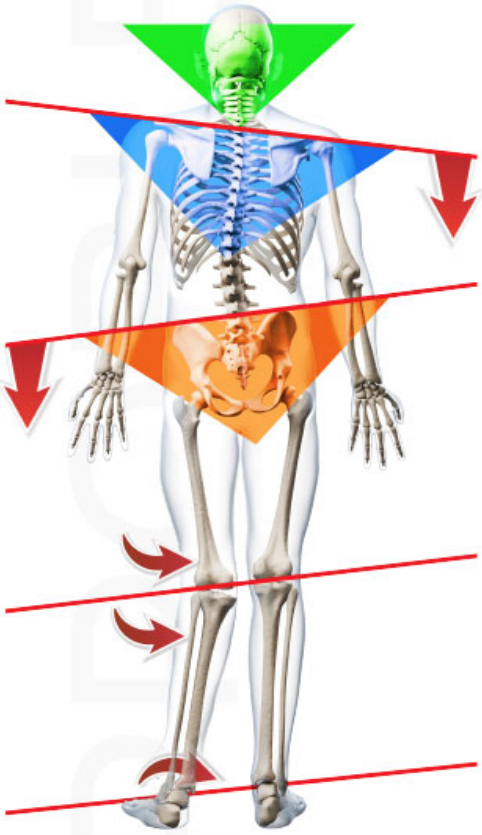
a. Pelvic torque or obliquity
b. Unlevel femoral heads

c. Postural scoliosis
d. Disc degeneration/spondylosis

FOOT LEVELERS

PROBLEM

Pronation causes dysfunction throughout the Kinetic Chain.



What is pronation?

Pronation occurs when feet roll **inwards.** People who excessively pronate may experience an inward rotation of the knee and forward tilting of the pelvis, causing pain in the feet, knees, hips, back, shoulders and neck.

99% of people have mild to severe pronation

80%
of people suffer from **Low Back Pain**

other problems caused by pronation include:

- Knee Pain
- Hip Pain
- Plantar Fasciitis
- Sciatica
- Tech Neck
- Shin Splints
- Runner's Knee

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FOOT LEVELERS

Landmark Study: Shoe Orthotics for Treatment of Chronic Low Back Pain.

Published in Archives of Physical Medicine and Rehabilitation in 2017

Conclusions:

- FLI custom orthotics alone improved Chronic LBP by **34.5 %**
- The combination of FLI orthotics and Chiropractic care led to a reduction in LBP by **40.4%**
- FLI orthotics and Chiropractic care resulted in a **32.3%** INCREASE IN FUNCTION!!

Cambron JA, Dexheimer JM, Duarte M, Freels S, Shoe Orthotics for the Treatment of Chronic Low Back Pain: A Randomized Controlled Trial, ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION (2017), doi: 10.1016/j.apmr.2017.03.028.

Journal of Chiropractic Medicine: 2005

Chiropractic Adjustments and Orthotics Reduce Symptoms for Standing Workers

Findings after 6 weeks:

- The control group did not experience much change. **No orthotics!**
- The orthotics-only group **showed improvement** in symptoms, activities of daily living, sport and recreation, and quality of life.
- The **combination of chiropractic care and orthotics showed the greatest improvement** in symptoms, ADL's, sports and recreational, and quality of life.

Zhang J. Chiropractic adjustments and orthotics reduced symptoms for standing workers. *J Chiropr Med.* 2005;4(4):177-181. doi:10.1016/S0899-3467(07)60148-7

Leg Length Inequality

ANATOMICAL

(Bone Discrepancy)

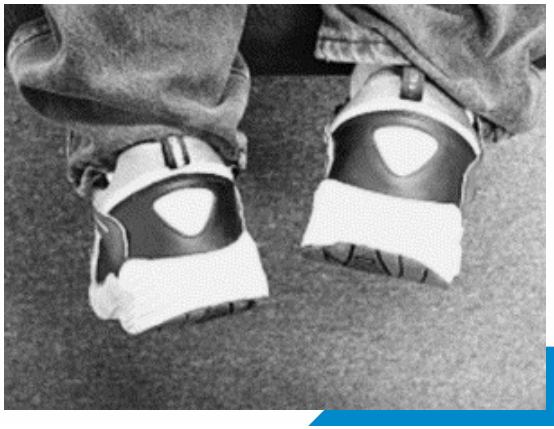
Trauma

Degeneration

Congenital

Systemic

Neoplasms



FUNCTIONAL

(Rotational Patterns)

Pelvis

Hips

Knees

Ankles

Feet

FOOT LEVELERS

Apparent leg Length Test:

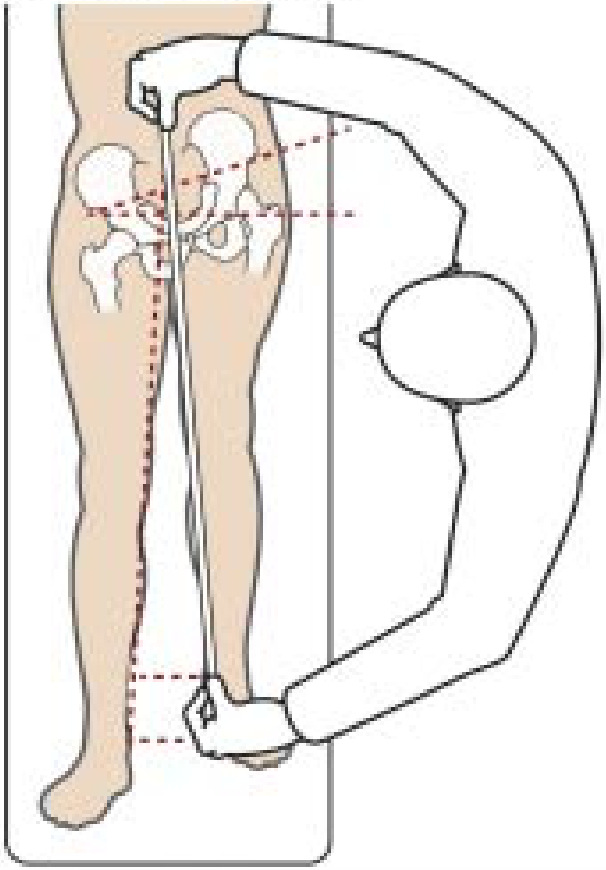
Umbilicus to medial/lateral malleolus

True (Actual) Leg Length Test:

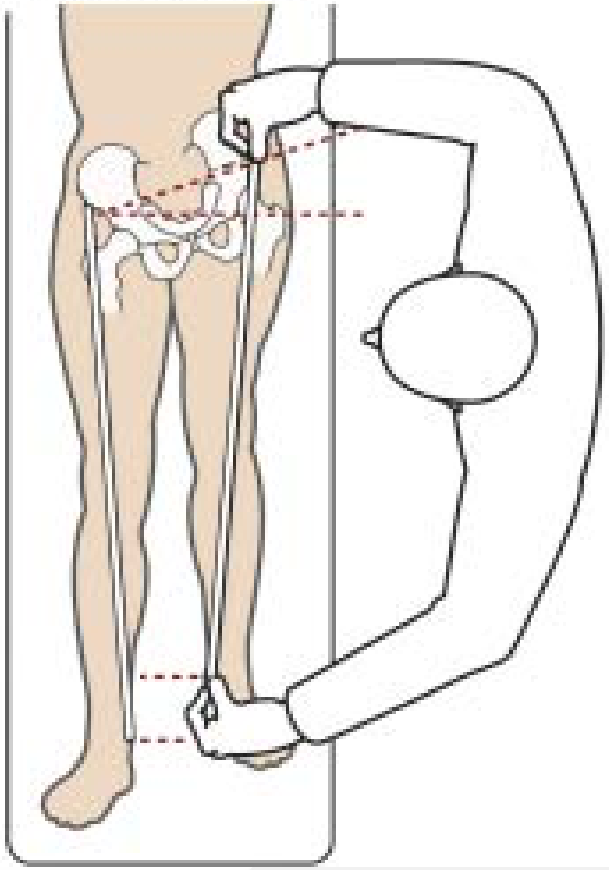
ASIS to medial/Lateral malleolus

FOOT LEVELERS

Apparent method



True method

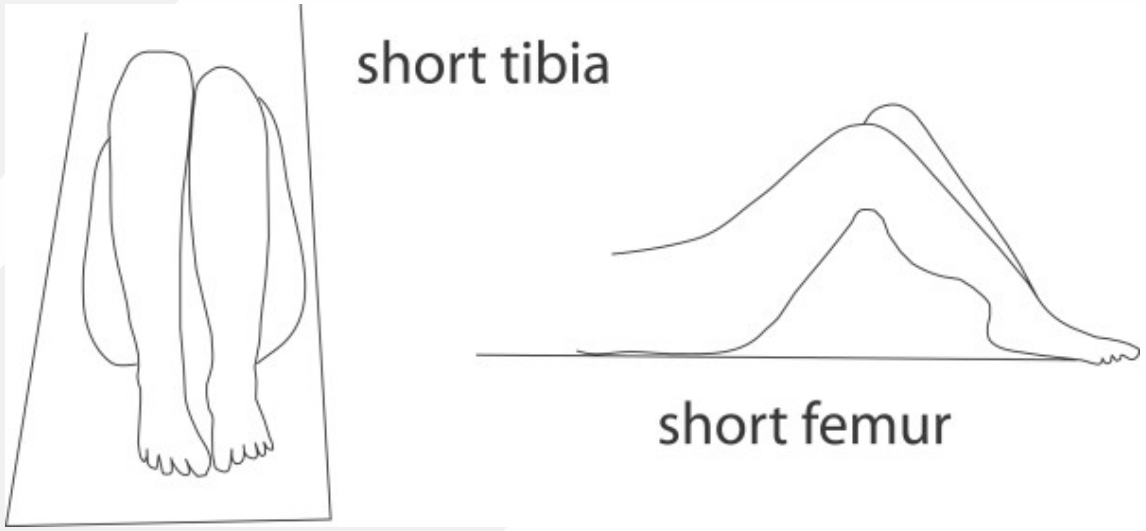


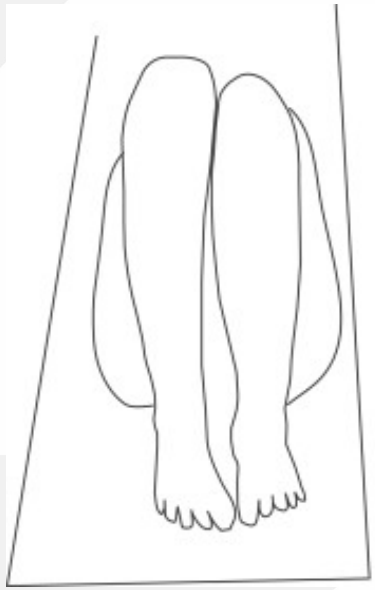
FOOT LEVELERS

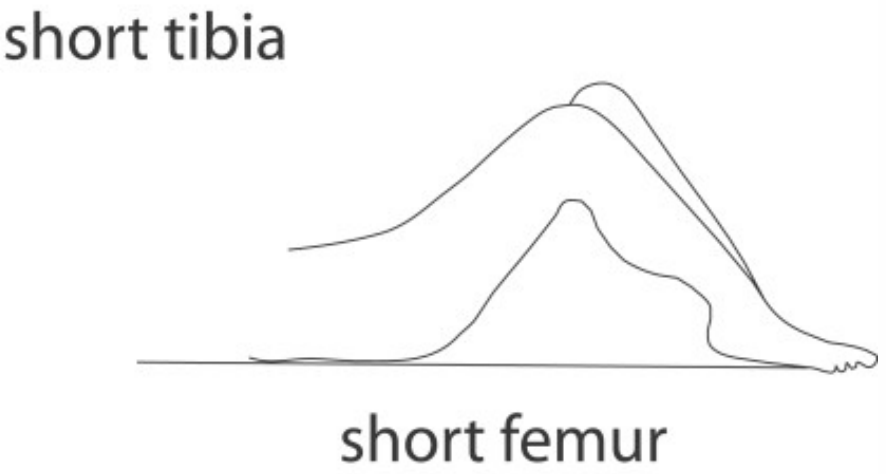
STRUCTURAL SHORT LEG

Allis Test: Supine, knees bent, feet aligned.

- Compare evenness of knees.







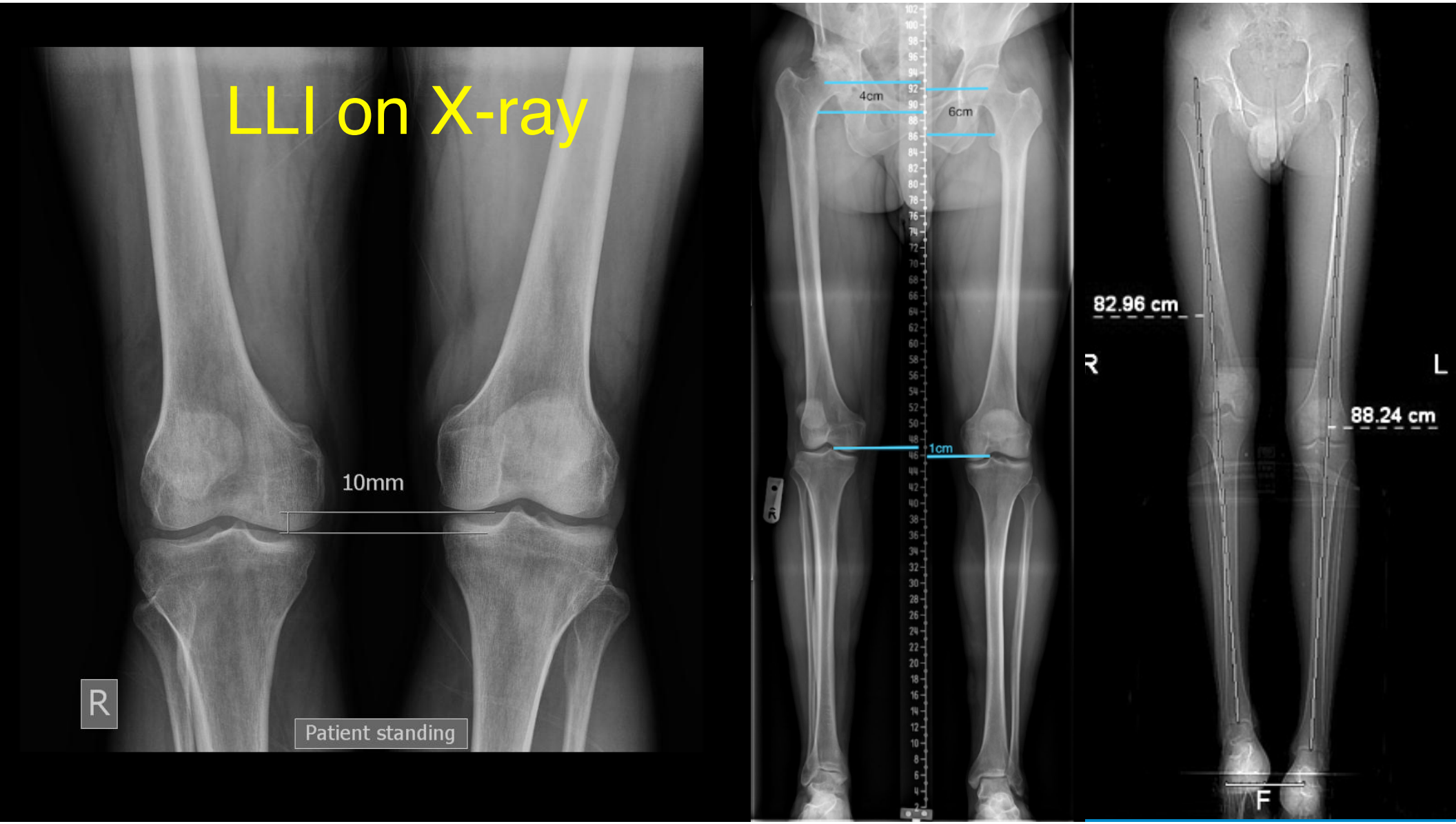
If one knee extends past the other = short femur on the short side.

If one knee is higher than the other = short tibia on the low side.

FOOT LEVELERS

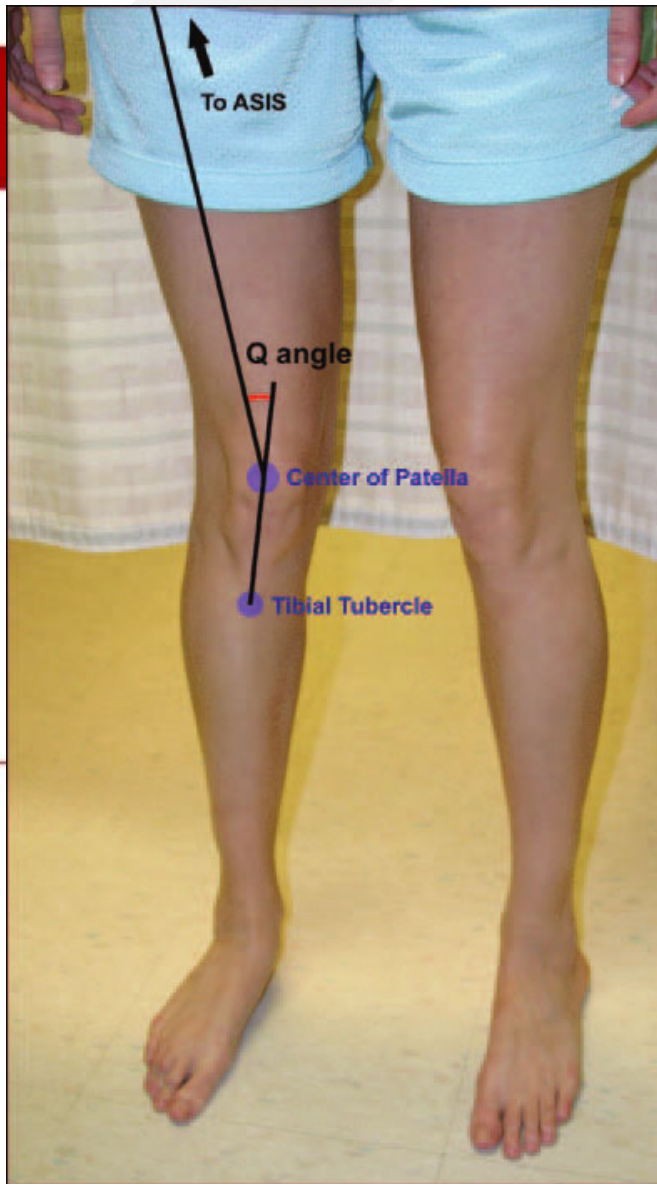
LLI on X-ray

Quantitation LLD


LLI on X-ray
10mm
R
Patient standing
4cm
6cm
1cm
82.96 cm
88.24 cm
R
L
F

Q Angle

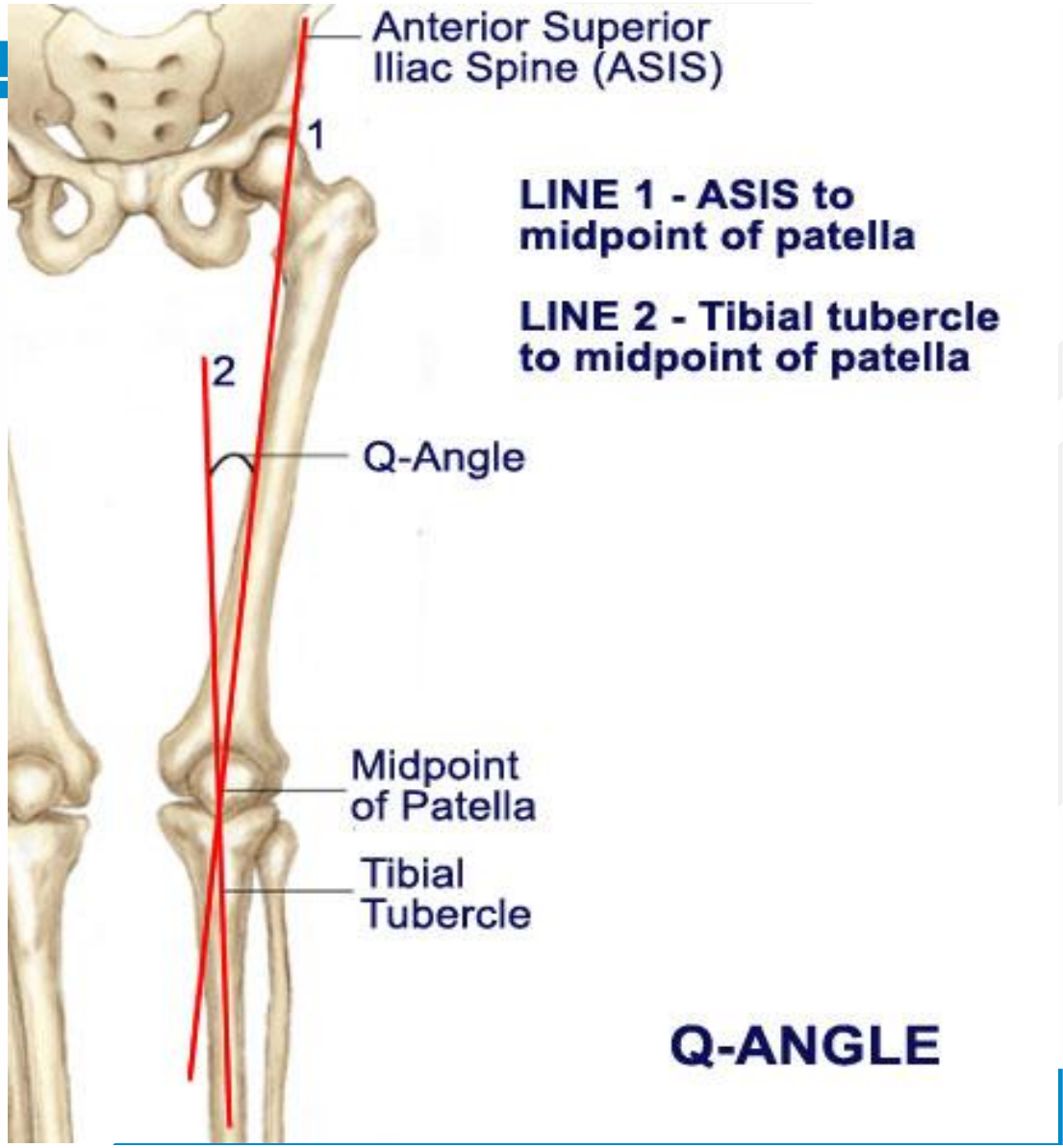
- Assessment of
  - Lower extremity alignment
  - Patella position
- Most efficient angle for quadriceps to function is ~10º
  - Males: 10-14º
  - Females: 15-17º
- Genu valgum (knock kneed)
  - > 17º = excessive
- Genu varus (bowlegged)
  - Negative
- ↑ Q angle => ↑ stress on MCL



FOOT LEVELERS

Research at Logan CC by Robert Kuhn D.C., DACBR demonstrates Foot Levelers' orthotics improve Q-angle and patellar tracking.

2002 Sept Vol. 25 #7 Q-Angle and Patellar Tracking Study

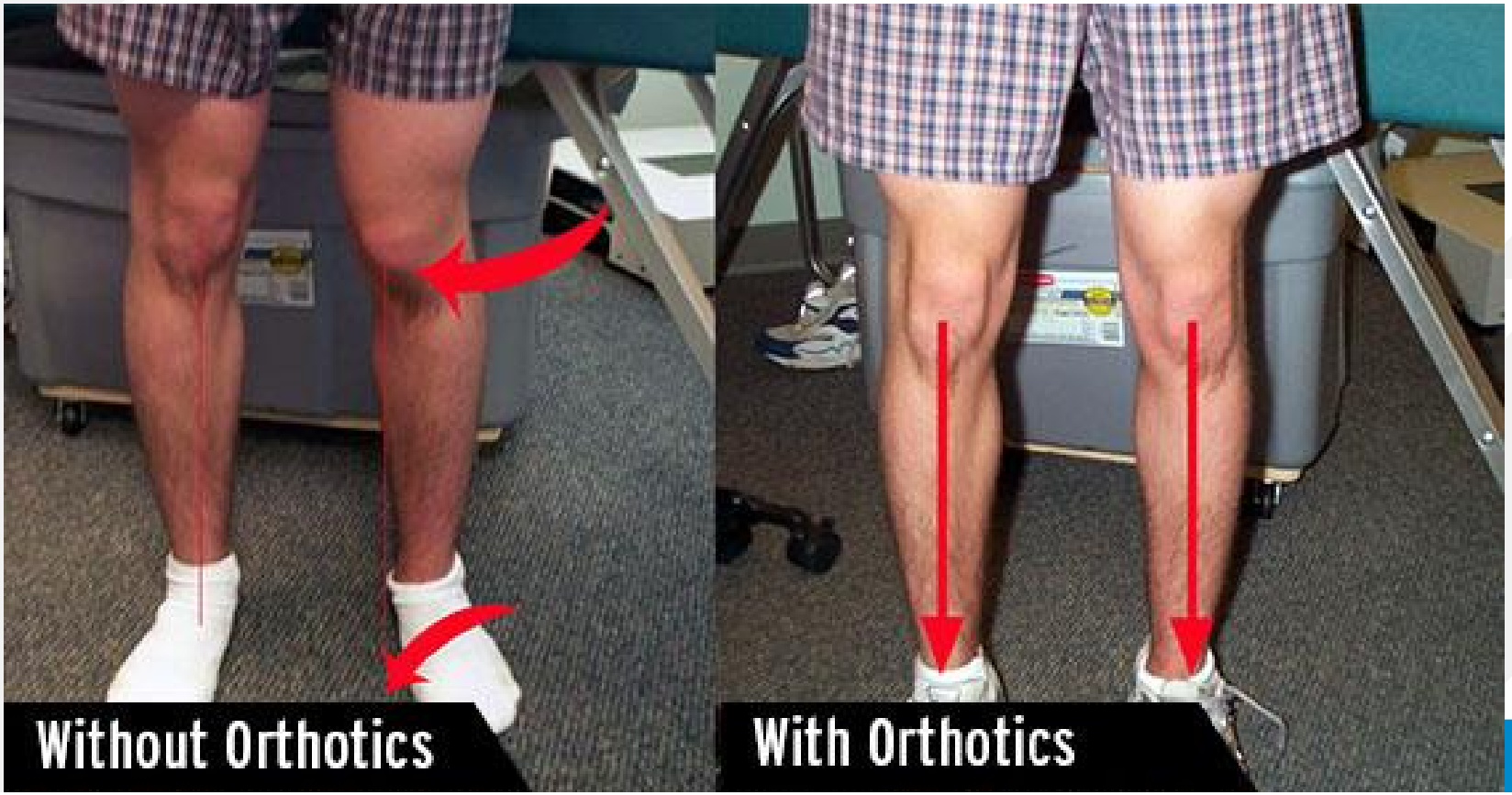


FOOT LEVELERS

Do SPS Reduce Q-Angle?

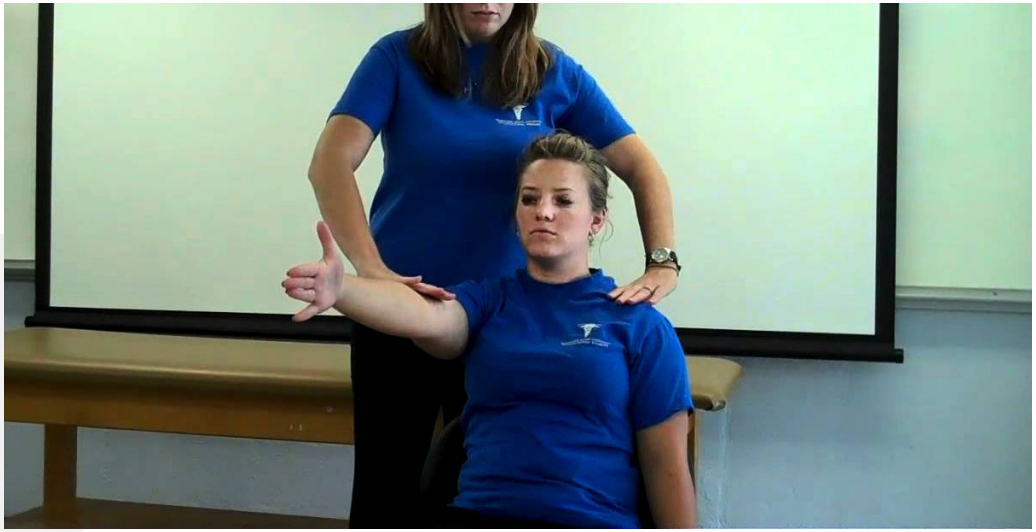
Effect on Q-Angle with insertion of an Orthotic Device

Robert Kuhn DC, Terry Yochum DC, Anton Cherry DC, Sean Rodgers DC, Dennis Nosco PhD
Accepted as a Platform Presentation, 2003 ACC – RAC VII, New Orleans, March 13-15, 2003

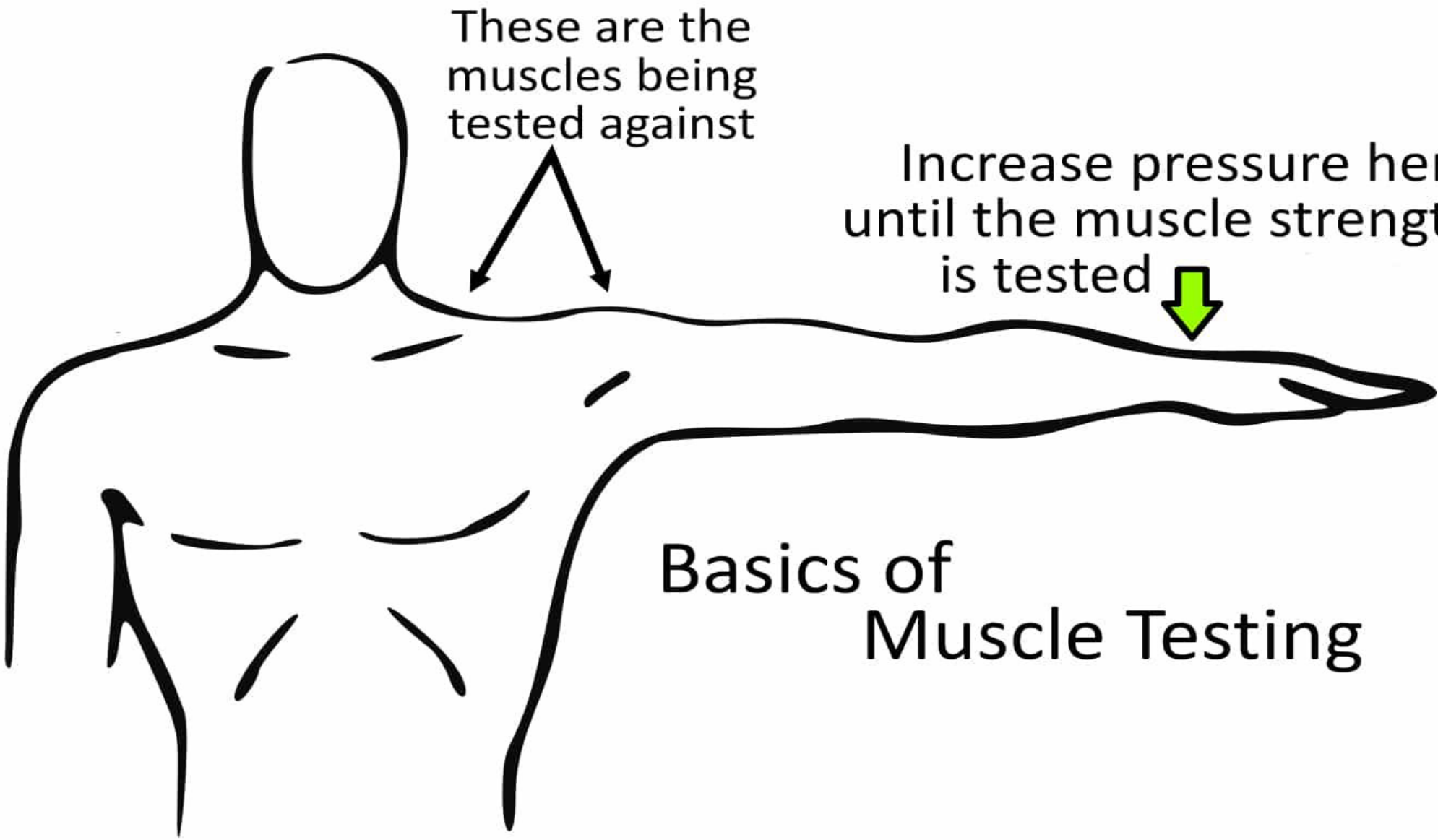


Muscle Test

A muscle test involves putting pressure on a muscle and interpreting the response of that muscle. The **testee** holds out his or her arm and the **tester** applies steady downward pressure on the arm.



If the muscle gives way and the arm moves, this an unlocking muscle, which indicates stress or the answer *no*. If the muscle holds and the arm stays still, this a locking muscle, which indicates no stress or the answer *yes*.


These are the muscles being tested against
Increase pressure here until the muscle strength is tested
Basics of Muscle Testing

FOOT LEVELERS

NEUROLOGICAL EXPLANATION

- Nociceptors send impulses to the spinal cord causing Pre-Synaptic Inhibition of the anterior horn cells.

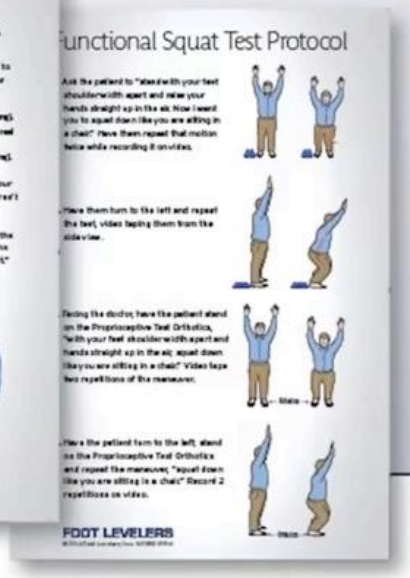
- This produces 7-10 seconds of muscle weakness.

NEUROLOGICAL EXPLANATION

- An adjustment reduces nociceptor activity.
- Pre-Synaptic Inhibition is decreased (eliminating the 7-10 seconds of muscle weakness).
- Muscle strength is increased.

FUNCTIONAL MUSCLE TESTING

Proprioceptive Test Kit



PHASE 1

Proprioceptive Testing

After finishing the side view video of the patient standing on the functional orthotics...

"Stay standing on the functional orthotics for a moment, I am going to do a muscle test to see if your nervous system communicates to your muscles in an efficient manner."

1) Hold your arm up real strong and don't let me push it down, resist.(tests strong).

2) Good, now step off the funtional orthotics and let's re-test. Hold the arm up real strong, resist. (weak test)

3) Stand back on the functional orthotics and lets check that again.(tests strong).

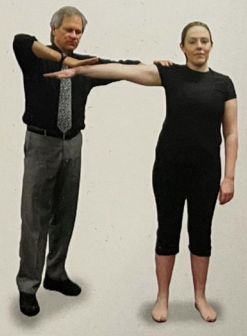
That tells me that your brain is communicating more efficiently to your muscles when you stand on the functional orthotics than when you aren't standing on them.

The fact that the arches in your feet flatten out a little like we saw on the foot scan contribute to stress in your nervous system and that weakens some of your postural muscles, we just used your arm muscle to test it."

Without Orthotics
Less Resistance

Unsupported

With Orthotics
More Resistance



Supported

PHASE 2

Functional Squat Test Protocol

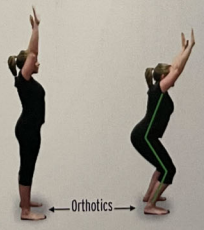
For the maximum impact, Foot Levelers recommends the use of a postural screening software.

1. Ask the patient to "stand with your feet shoulder-width apart and raise your hands straight up in the air. Now I want you to squat down like you are sitting in a chair." Have them repeat that motion twice while recording it on video.

2. Facing the doctor, have the patient stand on the Proprioceptive Test Orthotics, "with your feet shoulder-width apart and hands straight up in the air, squat down like you are sitting in a chair." Video tape two repetitions of the maneuver.

3. Have them turn to the left and repeat the test, video taping them from the side view. Note how patient's arms do not cover ear.

4. While the patient is still turned to the left, have them stand on the Proprioceptive Test Orthotics and repeat the maneuver. Note how patient's arm does cover ear.



FOOT LEVELERS

MANUAL MUSCLE TESTING

Medial Longitudinal Arch

Iliopsoas

Lateral Longitudinal Arch

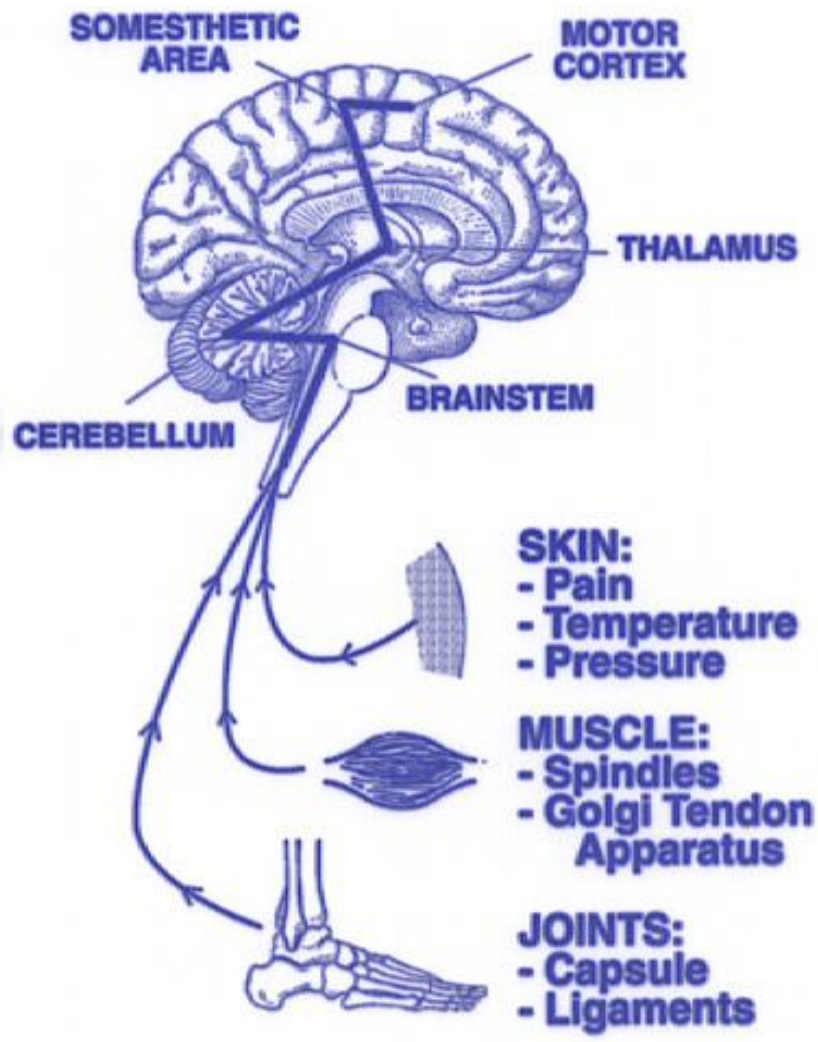
Gluteus Medius/Minimus

Anterior Transverse Arch

Quadriceps & Hamstrings

FOOT LEVELERS

Structural stress produces muscle imbalances as a result of nerve dysfunction

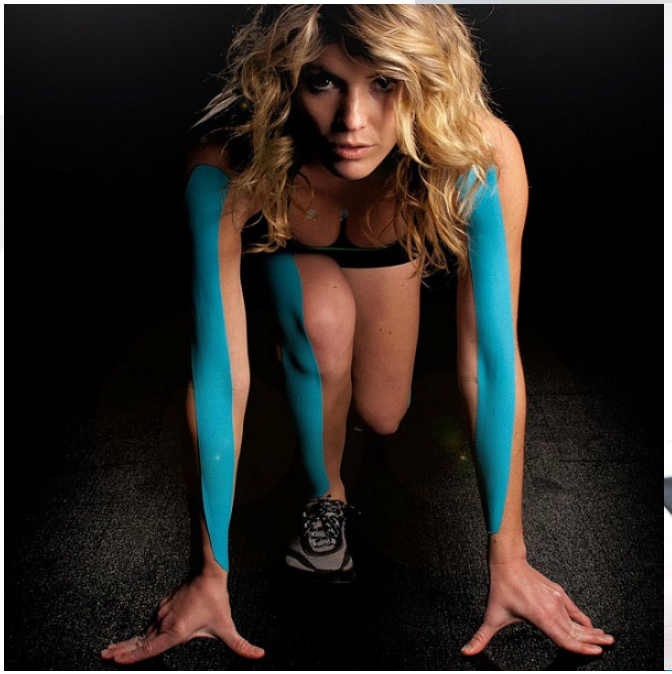


FOOT LEVELERS

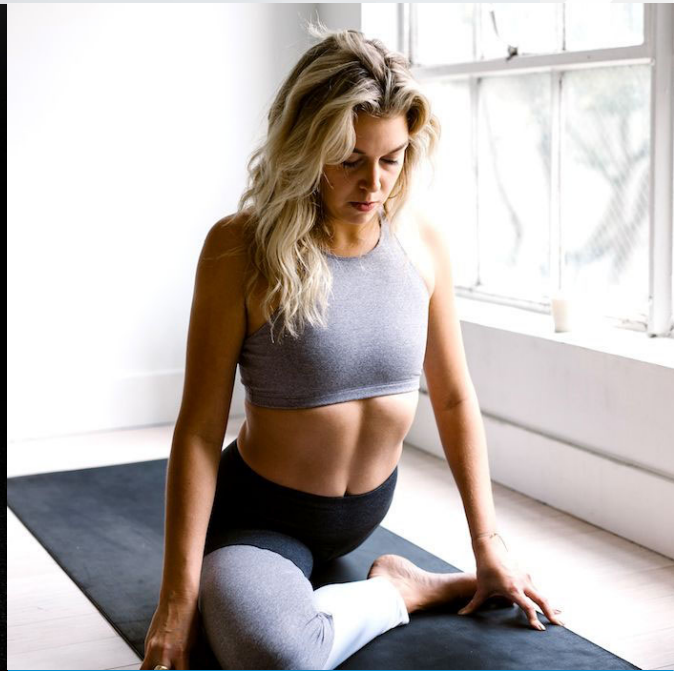
TREATMENT - ASR PRINCIPLE

1. Adjust

2. Stabilize

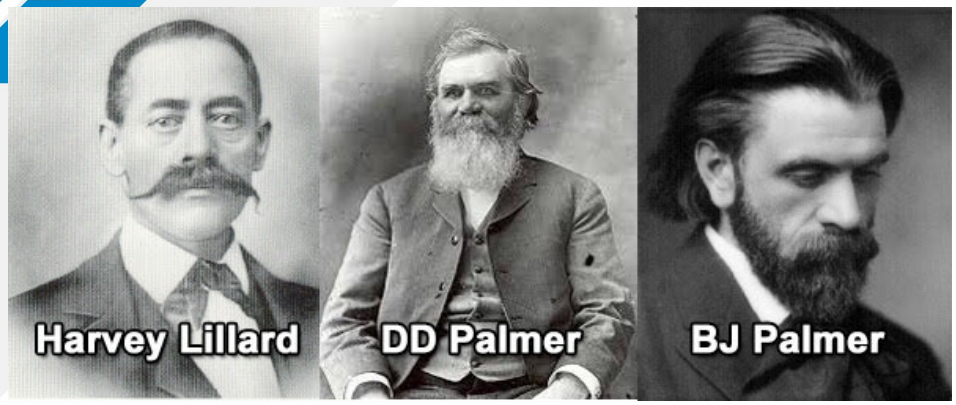


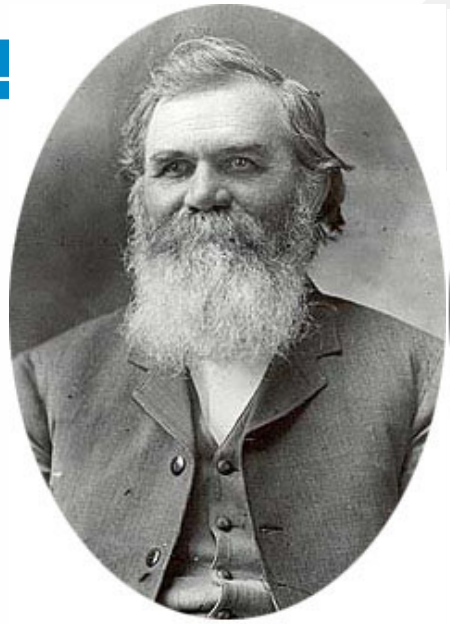
3. Rehab



FOOT LEVELERS

CHIROPRACTIC





D.D. PALMER
DISCOVERER OF CHIROPRACTIC

B.J. PALMER
DEVELOPER OF CHIROPRACTIC

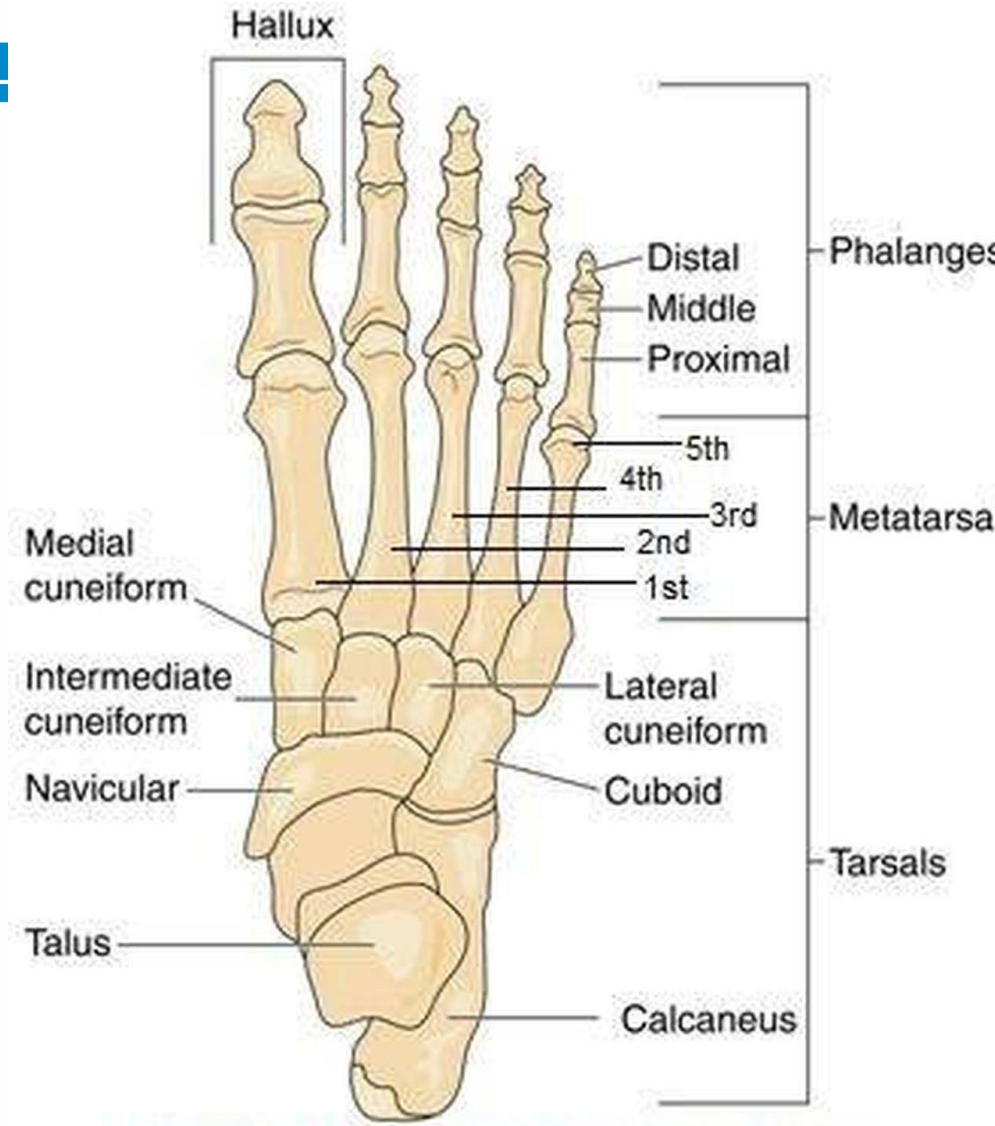
…preserves and restore health.

…removes the interference on the nervous system so that the innate can heal the body.

…restores structural balance and neurological function.

FOOT LEVELERS

How do you want to adjust the 26 bones?

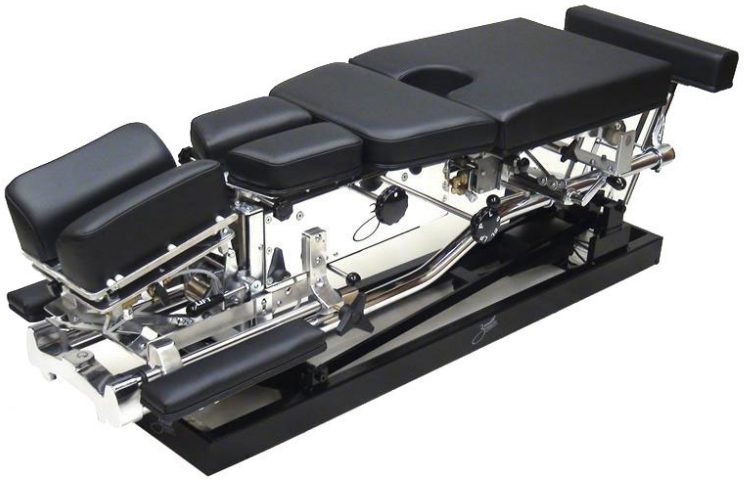


BONES OF THE FOOT (FROM ABOVE)

FOOT LEVELERS

TYPES OF ADJUSTING

- Manual/Diversified
- Drop table
- Spring Loaded Instrument



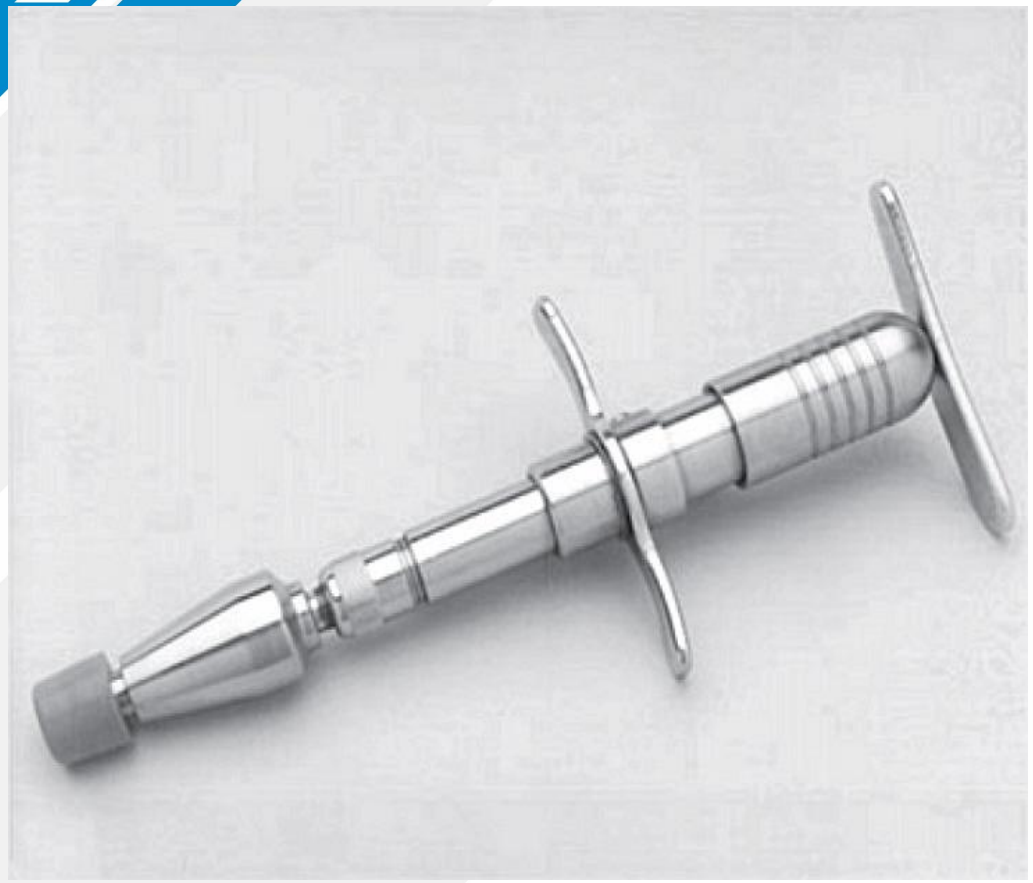
FOOT LEVELERS

DROP TABLE TIPS

- Tension
- Inhale/exhale
- Spinal contours

FOOT LEVELERS

ACTIVATOR



Computerized Adjusting in Your Hands

impulse iQ ADJUSTING INSTRUMENT

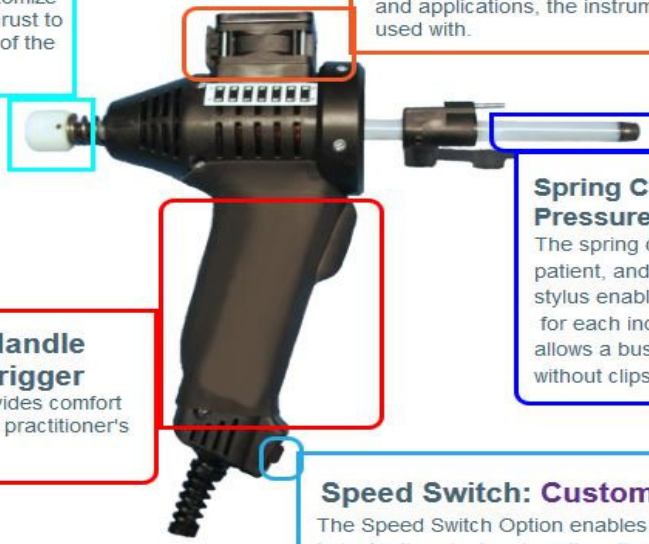
Features

- Stainless Steel Bezel For Precise Action
- LED Indicator for Preload Control
- Choose from Three Force Settings
- Audible/Visual Feedback For Doctor and Patient
- Micro-chip Computer With Auto-Sense® Technology
- Validated Accelerometer to Detect Spinal Motion
- Ten Foot Cord for Optimum Mobility
- Lightweight and Durable Lexan® Housing

The Pro-ArthroStim® Instrument

Variable Amplitude Knob
A practitioner can customize the amplitude of the thrust to best match the needs of the application.

Auto-Fan: Custom OPTION
The exclusive cooling system Auto-Fan Option increases the number of techniques, and applications, the instrument can be used with.



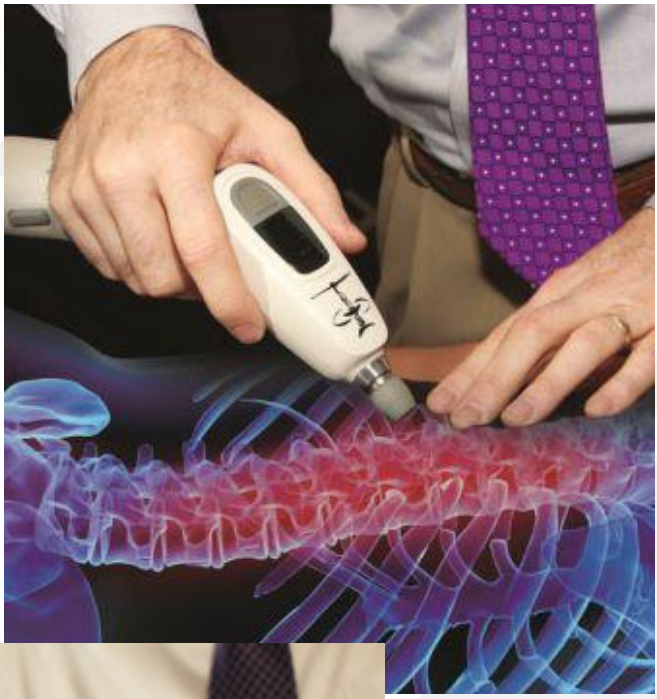
Spring Cushioned Pressure Responsive Stylus
The spring cushioned action ensures comfort for the patient, and the practitioner. The pressure sensitive stylus enables a practitioner to instantly tailor the input for each individual. The 'Fast On-Off Friction-Fit' design allows a busy practitioner to quickly exchange adaptors - without clips or locks.

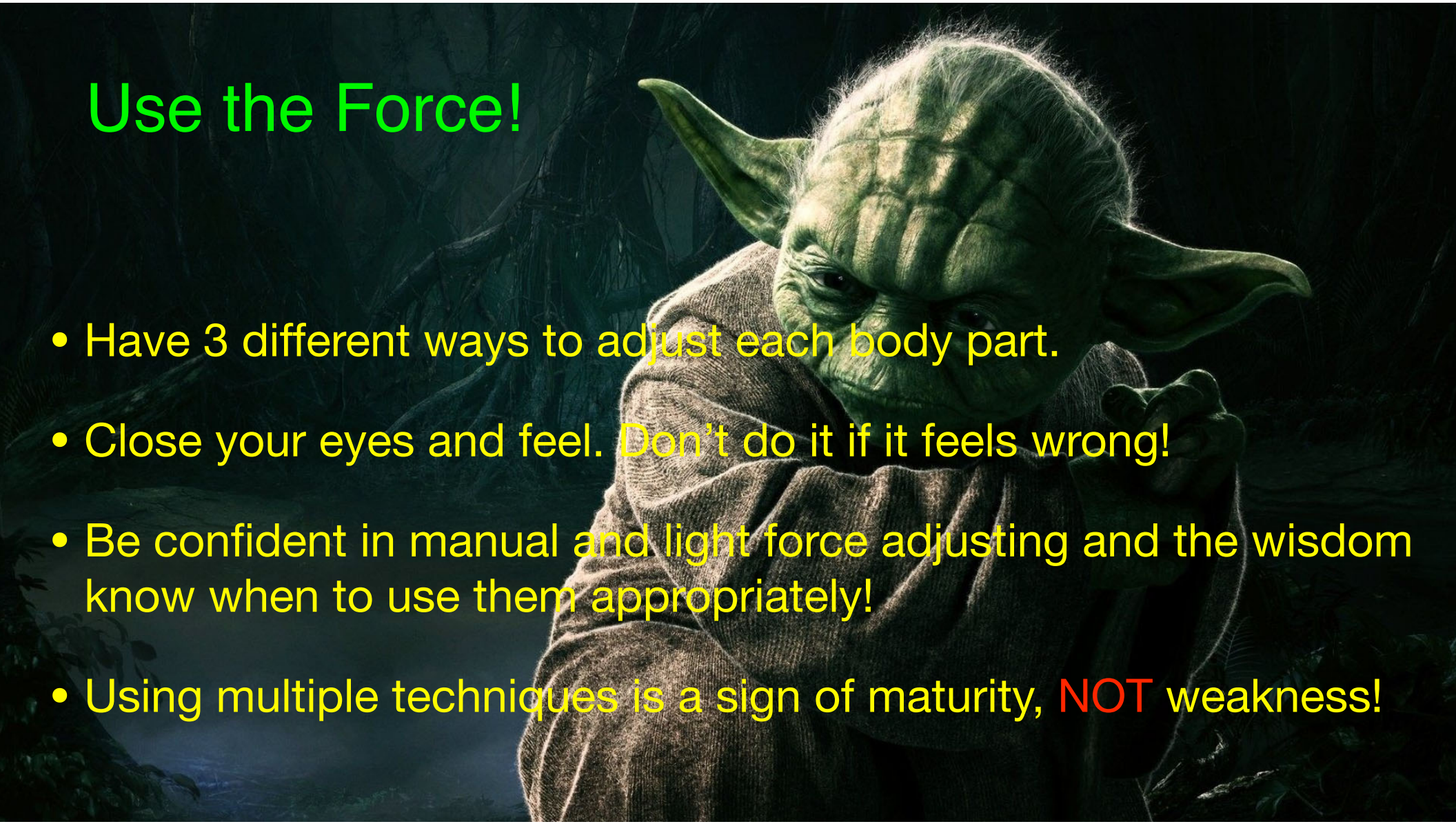
Full Cushion Handle and Comfort Trigger
This combination provides comfort and protection for the practitioner's hand.

Speed Switch: Custom OPTION
The Speed Switch Option enables a practitioner to instantly select various thrusting rates at the flip of a switch.

INSTRUMENT ADJUSTING

- Proper tension settings, rings
- Appropriate #’s of thrusts
- Patient comfort!



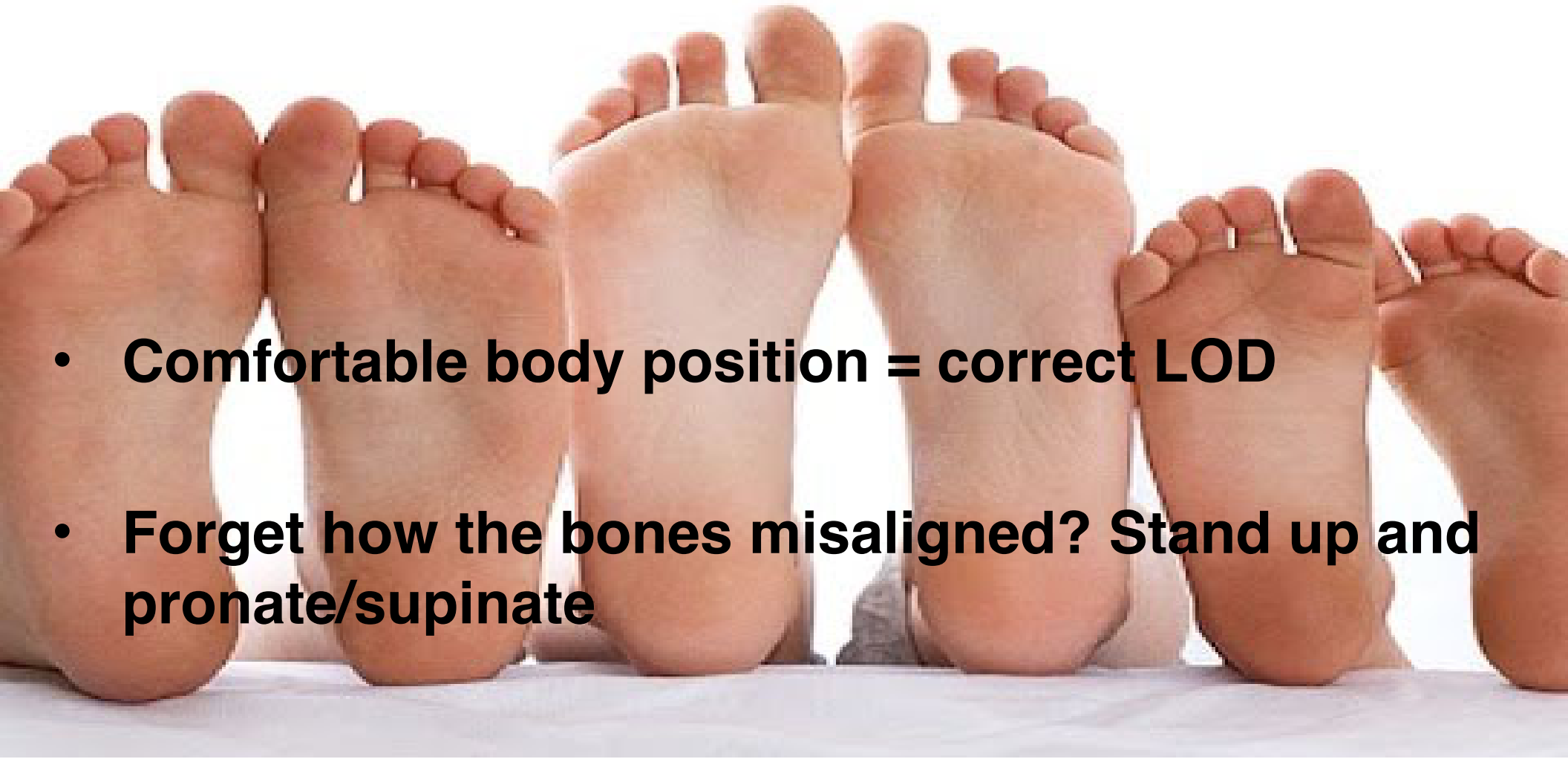


Use the Force!

- Have 3 different ways to adjust each body part.
- Close your eyes and feel. Don't do it if it feels wrong!
- Be confident in manual and light force adjusting and the wisdom know when to use them appropriately!
- Using multiple techniques is a sign of maturity, NOT weakness!


READY FOR SOME HANDS ON?

THE "WONG WAY" TO ADJUST THE FOOT



- **Comfortable body position = correct LOD**
- **Forget how the bones misaligned? Stand up and pronate/supinate**

FOOT LEVELERS

NAVICULAR BONE

Misaligns: inferior and medial

(down and in)

"Push" superior and lateral

(up and out)


Navicular
PALMER
College of Chiropractic

FOOT LEVELERS

NAVICULAR - INDEX FINGER

Navicular - Index finger

FOOT LEVELERS

Navicular - Thenar

FOOT LEVELERS

Navicular - Hypothenar/Pisiform

Navicular

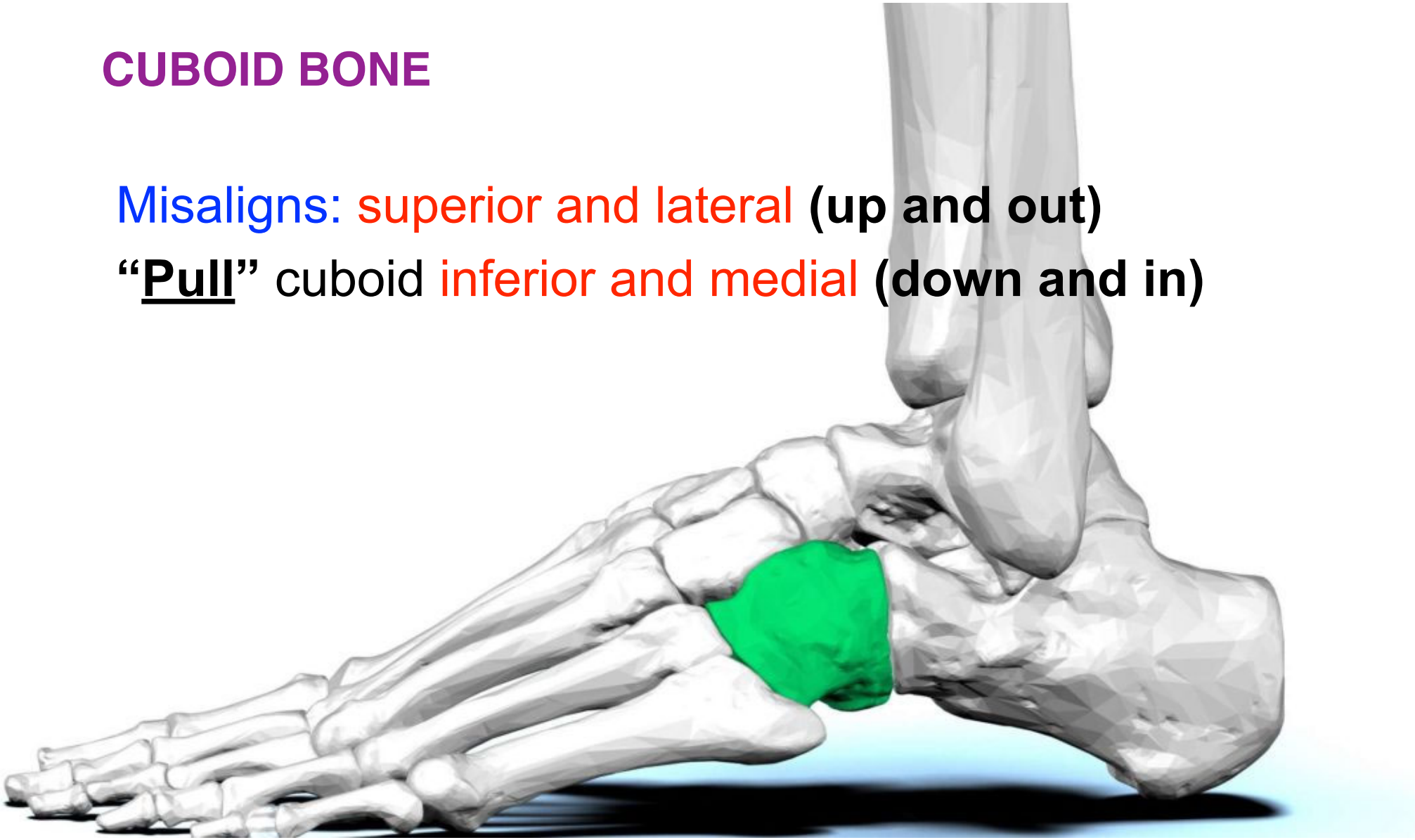
- Prone: CP - double thumb, pisiform
- Drop table: CP - pisiform, double thumb (prone)
- Adjusting instrument:


Navicular

CUBOID BONE

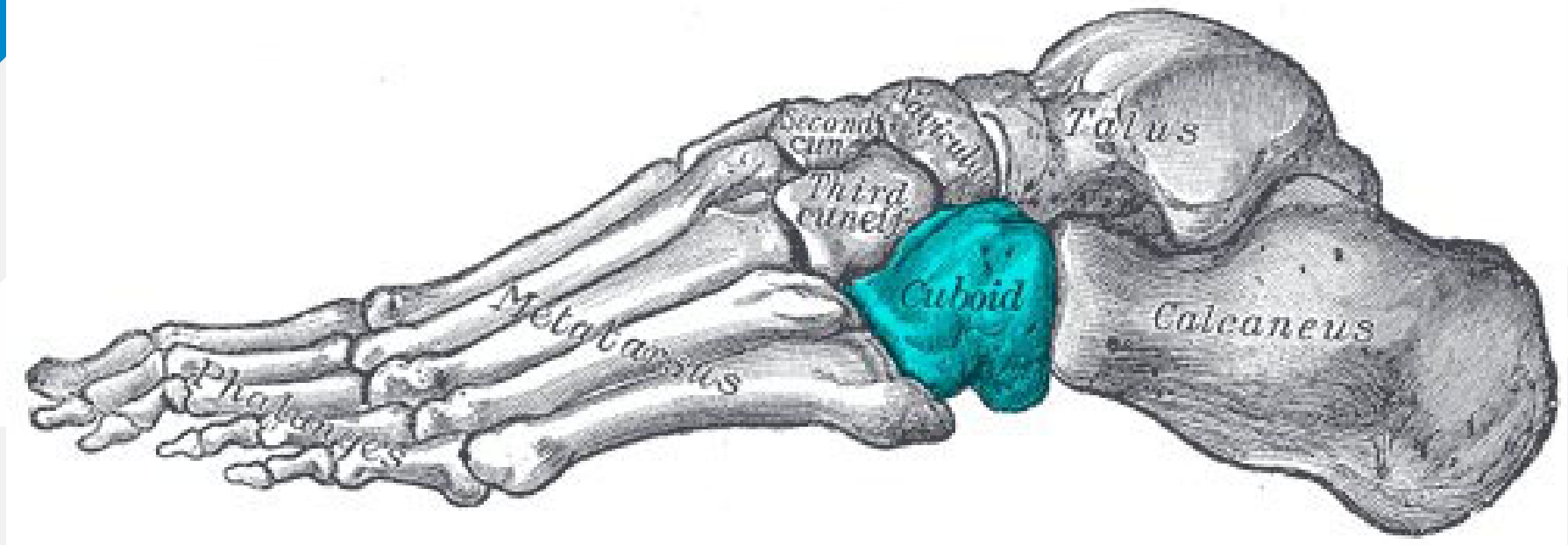
Misaligns: superior and lateral **(up and out)**

"**Pull**" cuboid inferior and medial **(down and in)**




Cuboid
PALMER
College of Chiropractic
ALUMNI

CUBOID



- Supine: CP-double thumb web, double index or middle finger
- Drop table: foot dorsal, lateral side up. CP-Pisiform, double thumb w/foot slightly dorsiflexed for tension.
- Spring loaded instrument: watch LOD

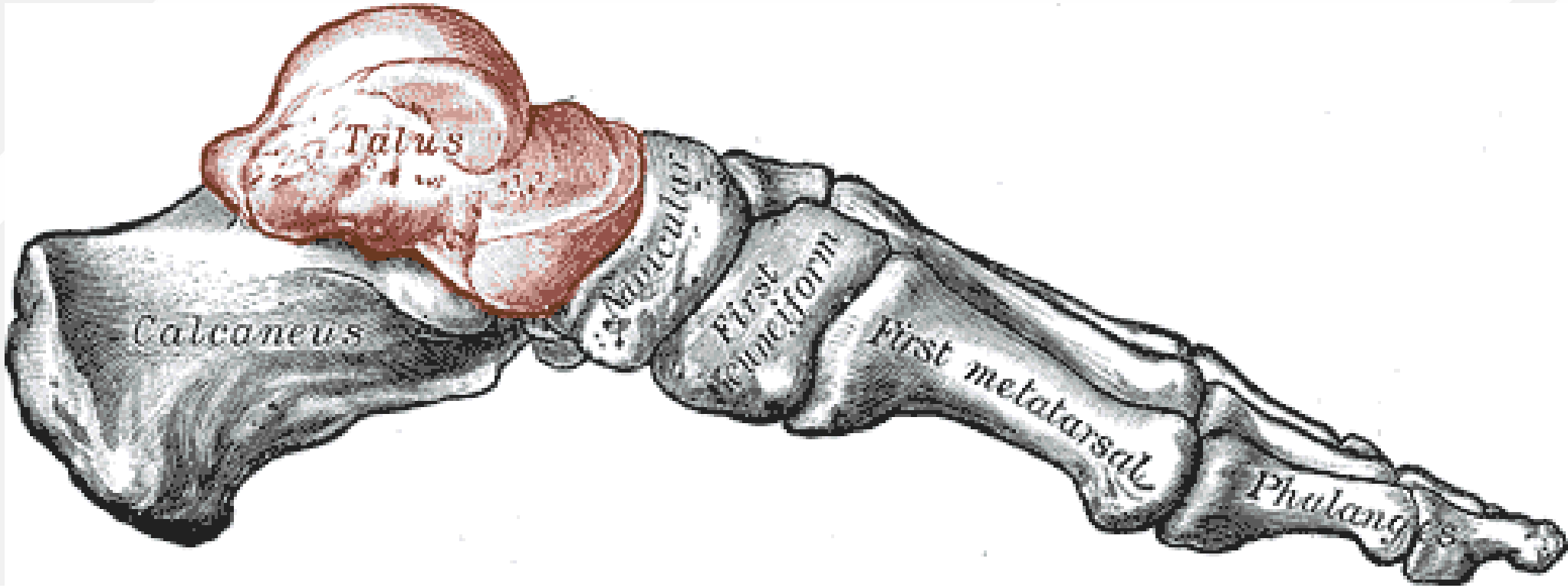
FOOT LEVELERS

Cuboid - double index

TALUS

Misaligns: **anterior and lateral**

"**Scoop**" talus **posterior and medial**




Talus
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ALUMNI

FOOT LEVELERS

Talus - Double index

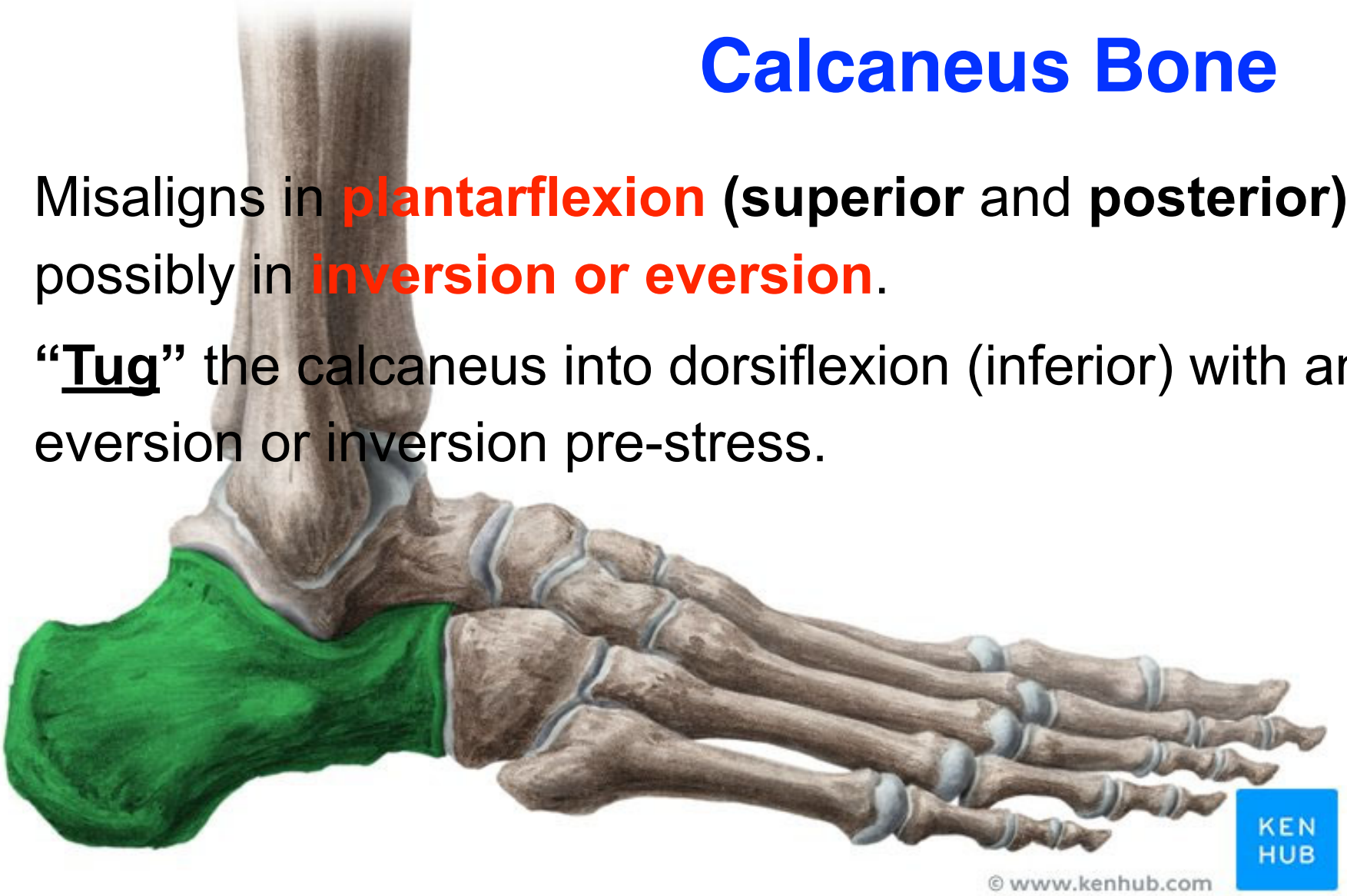
TALUS BONE

- Supine: CP - double middle or index finger
- Drop table: foot dorsal side up. CP is Pisiform or double thumb with foot slightly dorsiflexed
- Spring loaded instrument: watch LOD

Calcaneus Bone

Misaligns in **plantarflexion** **(superior** and **posterior)** and possibly in **inversion or eversion**.

"Tug" the calcaneus into dorsiflexion (inferior) with an eversion or inversion pre-stress.

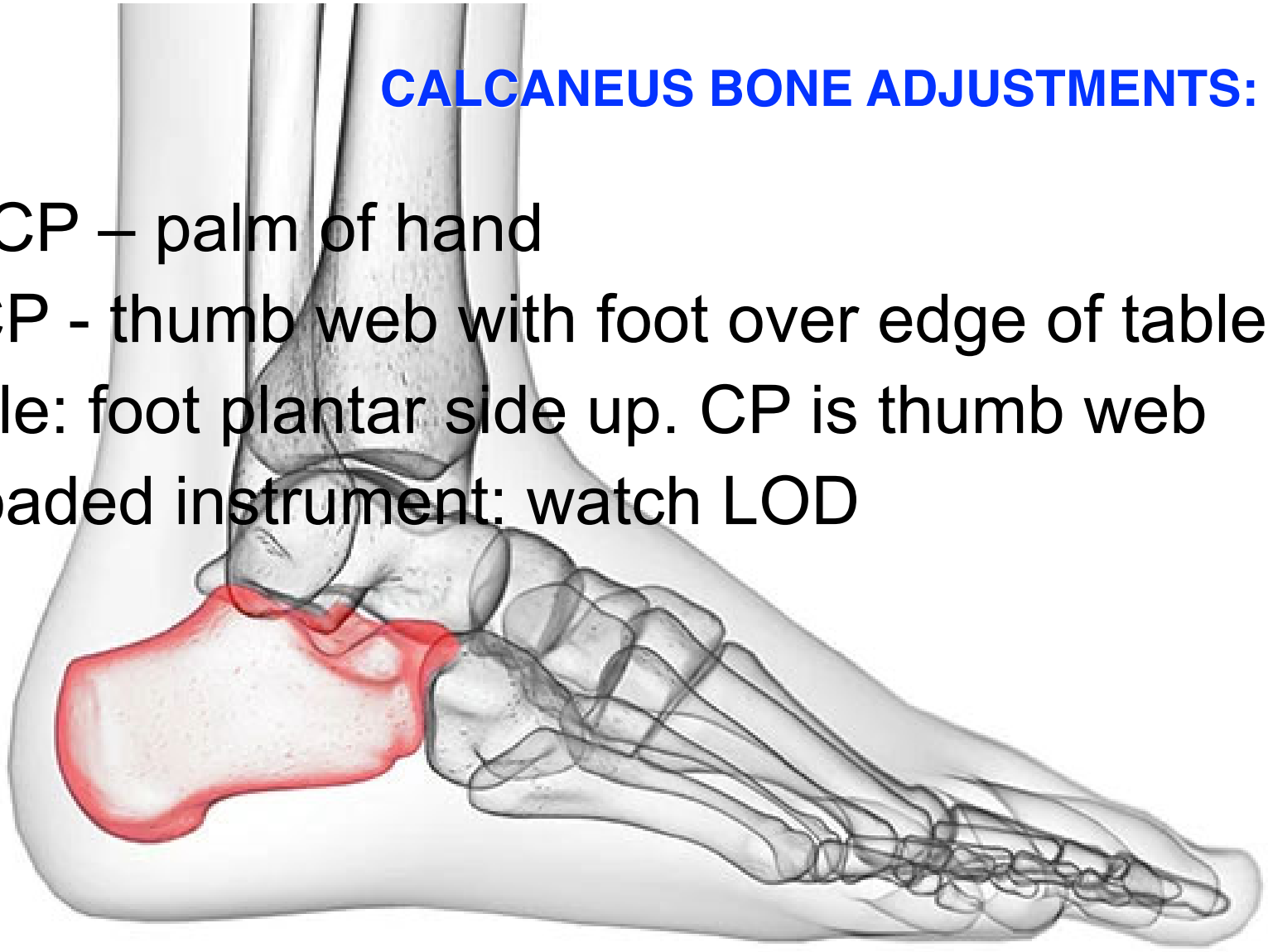



Calcaneus
PALMER
College of Chiropractic

FOOT LEVELERS

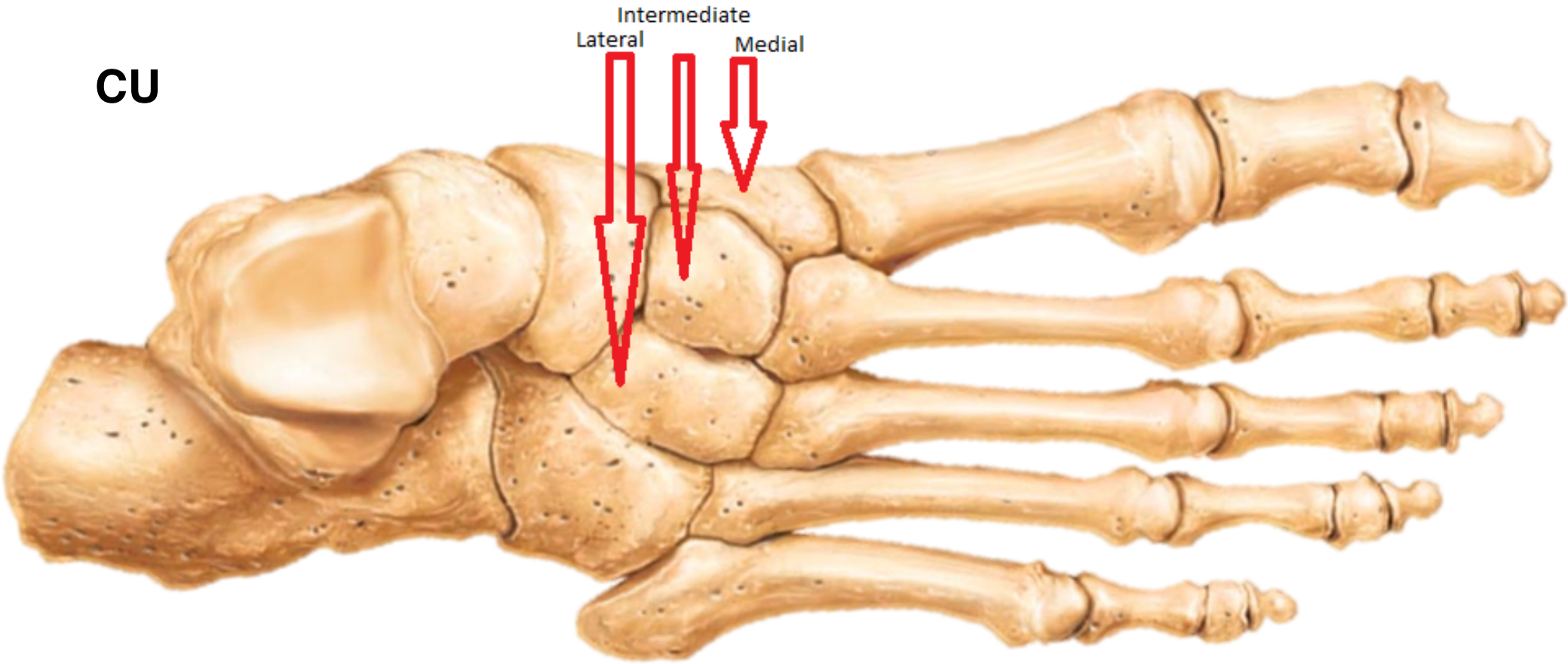
CALCANEUS BONE ADJUSTMENTS:

- Supine: CP – palm of hand
- Prone: CP - thumb web with foot over edge of table
- Drop table: foot plantar side up. CP is thumb web
- Spring loaded instrument: watch LOD




Calcaneus

CU



Cuneiforms, MT heads 2,3,4 go **inferior** **(drop to the floor)**.

"Bicycle" the foot