



# THE FOOT'S CONNECTED TOO...

Evaluation Procedures for  
Orthotic Therapy Prescription  
©2005



 **BIOMECHANICAL**  
S E R V I C E S

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# BIOMECHANICAL SERVICES RX CARD:

Account No.: \_\_\_\_\_

P.O. No.: \_\_\_\_\_

PRACTITIONER'S NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

PATIENT NAME: 

LAST NAME		FIRST NAME
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SEX: M/F AGE: \_\_\_\_\_ WEIGHT: \_\_\_\_\_ HEIGHT: \_\_\_\_\_ PREVIOUS ORTHOTIC THERAPY: Y/N DEVICE No.: \_\_\_\_\_

SHOE SIZE: \_\_\_\_\_ SHOE STYLE: \_\_\_\_\_ SHOES ENCLOSED: Y/N

OCCUPATION/ACTIVITY LEVEL: \_\_\_\_\_

SPECIAL PROBLEMS (NEUROMOTOR, STRUCTURAL, SURGICAL) \_\_\_\_\_

CHIEF COMPLAINT: \_\_\_\_\_

OTHER COMPLAINTS:(KNEE/HIP/BACK) \_\_\_\_\_

**RANGE OF MOTION:**

- ★ Subtalar:
- LEFT  Average  <15°  
 <5° Eversion from Neutral  
 Axis \_\_\_\_\_
- RIGHT  Average  <15°  
 <5° Eversion from Neutral  
 Axis \_\_\_\_\_

- Midtarsal (Global):
- LEFT  Within Normal Limits  Loose  
 Restricted
- RIGHT  Within Normal Limits  Loose  
 Restricted

- Midtarsal (Integrity):
- LEFT  Stable  Unstable
- RIGHT  Stable  Unstable

- First Ray:
- LEFT  Flexible  Semi-rigid  
 Rigid
- RIGHT  Flexible  Semi-rigid  
 Rigid

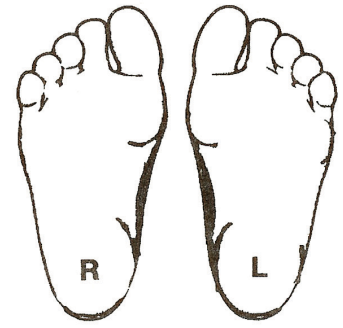
- FIRST METATARSAL RAY POSITION:
- LEFT  Normal  Plantarflexed  
 Dorsiflexed
- RIGHT  Normal  Plantarflexed  
 Dorsiflexed

- Hallux Dorsiflexion (open chain):
- LEFT  >65°  >45°  <25°
- RIGHT  >65°  >45°  <25°

- Ankle Dorsiflexion:
- LEFT  ≥10°  >3°  
 > 6°  ≈ 0°
- RIGHT  ≥10°  >3°  
 > 6°  ≈ 0°

- TOE POSITIONS:  
(Non-weight Bearing)
- LEFT  Contracted  Straight  
 HAV  Morton's
- RIGHT  Contracted  Straight  
 HAV  Morton's

○ LOCATION OF CORNS/CALLUSES:



- FOOT APPEARANCE:
- + Semi-weight Bearing Arch
- LEFT  High  Med  Low
- RIGHT  High  Med  Low
- + Weight Bearing Arch
- LEFT  High  Med  Low
- RIGHT  High  Med  Low

- ◆ Hallux Dorsiflexion (closed chain):
- LEFT  > 9°  > 4°  None
- RIGHT  > 9°  > 4°  None

◆ TIBIAL VARUM:  
Degrees Left \_\_\_\_\_ Right \_\_\_\_\_

- ◆ KNEE POSITIONS:
- LEFT  Genu Varum  Straight  
 Genu Valgum
- RIGHT  Genu Varum  Straight  
 Genu Valgum

- CALCANEAL STANCE POSITION:
- ◆ Neutral Subtalar
- LEFT  Inverted  Rectus  Everted
- RIGHT  Inverted  Rectus  Everted

- ◆ Resting/Relaxed
- LEFT  Inverted  Rectus  Everted
- RIGHT  Inverted  Rectus  Everted

- ◆ Half Squat
- LEFT  Rectus  Everted  More Everted
- RIGHT  Rectus  Everted  More Everted

SHORT LEG(IF ANY):  
LEFT/RIGHT \_\_\_\_\_ MM/INCHES

DIAGNOSIS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

PATIENT NAME: | | | | | | | | | | | | | | | | | | | | | |

SEX: M / F AGE: \_\_\_\_\_ WEIGHT: \_\_\_\_\_ HEIGHT: \_\_\_\_\_ PREVIOUS ORTHTOIC THERAPY: Y / N

SHOE SIZE: \_\_\_\_\_ SHOE STYLE: \_\_\_\_\_ SHOES ENCLOSED: Y / N

OCCUPATION/ACTIVITY LEVEL: \_\_\_\_\_

SPECIAL PROBLEMS (NEUROMOTOR, STRUCTURAL, SURGICAL):  
\_\_\_\_\_  
\_\_\_\_\_

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CHIEF COMPLAINT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OTHER COMPLAINTS (KNEE, HIP, BACK): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DIAGNOSIS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### KEY

- ★ = PRONE
- = SUPINE/LONG SITTING
- ⊕ = SIT TO STAND
- ◆ = STANDING



## RANGE OF MOTION:

### ★ SUBTALAR:

- LEFT
- Average
  - <math>< 15^\circ</math>
  - <math>< 5^\circ</math> Eversion from Neutral
  - Axis \_\_\_\_\_

- RIGHT
- Average
  - <math>< 15^\circ</math>
  - <math>< 5^\circ</math> Eversion from Neutral
  - Axis \_\_\_\_\_

From neutral position of the subtalar joint, there should be  $20^\circ$  of calcaneal inversion with passive open chain supination.

From neutral position of the subtalar joint, there should be  $10^\circ$  of passive open chain calcaneal eversion with pronation.

The subtalar joint is *Within Normal Limits* if there is  $30^\circ$  total range of motion, fully inverted to fully everted. It is *Loose* if it has greater than  $30^\circ$  total range of motion or greater than  $10^\circ$  eversion. It is *Restricted* if it has less than  $5^\circ$  eversion with pronation or less than  $15^\circ$  total range of motion (passive end range pronation to end range supination).



○ MIDTARSAL (GLOBAL):

LEFT  Restricted  
 Loose  
 Within Normal Limits

RIGHT  Restricted  
 Loose  
 Within Normal Limits

Grasp the calcaneus along the medial side in one hand and pronate the subtalar joint to end range of motion.

Grasp across the mid-foot with your contralateral hand. Range the OMJA and LMJA separately to assess available motion qualitatively around both axes.

Assess for ligamentous feel at the end range of motion, determine if it is spongy vs. solid. Also, assess total range of motion, as compared to your overall clinical population, contrasting experiential evaluations of mid-foot motions presented by other patients.



## ○ MIDTARSAL (INTEGRITY):

LEFT  Stable  
 Unstable

RIGHT  Stable  
 Unstable

Grasp the calcaneus along the medial side in one hand and supinate the subtalar joint to end range of motion. Grasp the cuboid between your index finger and thumb of your contralateral hand. Range the OMJA at the cuboid to assess available motion.

Grasp the calcaneus along the lateral side in one hand and supinate the subtalar joint to end range of motion. Grasp the navicular between your index finger and thumb of your contralateral hand, resting your other fingers and ulnar immanence along the 1st metatarsal. Range the LMJA at the navicular to assess available motion.

If detection of a change in range of motion is difficult, pronate the subtalar joint and retest to differentiate midtarsal locking and unlocking.

When the subtalar joint is maximally supinated, motion at the OMJA should be completely suppressed and motion at the LMJA should be significantly suppressed, which is a positive finding for midtarsal stability.



## ○ FIRST RAY:

- LEFT  Flexible  
 Semi-Rigid  
 Rigid

- RIGHT  Flexible  
 Semi-Rigid  
 Rigid

There should be 1/4" dorsiflexory excursion of the 1st metatarsal head with dorsiflexion/inversion ROM of the 1st Ray. Additionally, there should be 1/4" plantarflexory excursion of the 1st metatarsal head with plantarflexion/eversion ROM of the 1st Ray. If the range of motion is restricted in either direction, note semi-rigid. If the range is restricted in both directions, note rigid.



## ○ FIRST METATARSAL RAY POSITION:

- LEFT  Normal  
 Plantarflexed  
 Dorsiflexed

- RIGHT  Normal  
 Plantarflexed  
 Dorsiflexed

Establish a plane for the 2nd through 5th metatarsal heads between your index finger and thumb in one hand. Place your index finger and thumb of your contralateral hand onto the 1st metatarsal head. If the fingernail of the index finger holding the 1st met head is pressed into the pad of the index finger of the hand holding 2nd through 5th met heads, the 1st Ray is plantarflexed. If your thumbnail on the 1st presses into the pad of your thumb holding the 2nd through 5th met heads, the 1st Ray is dorsiflexed.



## ○ HALLUX DORSIFLEXION (OPEN CHAIN):

LEFT  >65°  
 >45°  
 >25°

RIGHT  >65°  
 >45°  
 >25°

Open chain - the hallux is measured relative to the 1st metatarsal shaft.

## ○ ANKLE DORSIFLEXION:

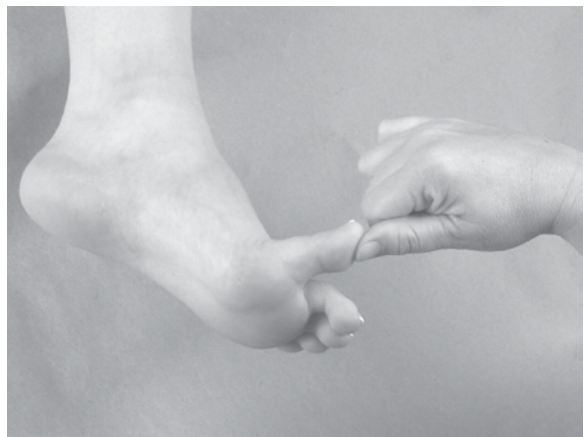
LEFT  ≥10°  
 >6°  
 >3°  
 ≤0°

RIGHT  ≥10°  
 >6°  
 >3°  
 ≤0°

With the inside palm of your hand against the ball of the foot, palpate STJ neutral with your outside hand. Raise and lower the fibula into a horizontal position using an angle finder to establish zero.

Dorsiflex the foot at the ankle until the lateral column reaches 90°. This is the starting point for measurement. Relocate the angle finder along the lateral margin of the calcaneus, against the plantar surface, in the sagittal plane. Continue passive dorsiflexion to end range of motion while maintaining neutral.

Observe how far past 90° the ankle angle measures into maximum dorsiflexion. Determine the difference between zero and end range dorsiflexion in degrees, report which threshold is achieved.



## ○ TOE POSITIONS:

(NON-WEIGHT BEARING)

LEFT  Contracted  
 Straight  
 HAV  
 Morton's

RIGHT  Contracted  
 Straight  
 HAV  
 Morton's

Plantarflex the toes to where the met heads blanch the skin on the dorsum of the foot. Locate the distal end of the first metatarsal head and the proximal aspect of the second metatarsal head. If the distal end of the first met head is shorter than the proximal aspect of the second met head (along the long axis of the foot), a Morton's Toe is present. Check corresponding box for positive finding.



## ○ LOCATION OF CORNS/CALLUSES:

Shade area where callusing is apparent on the bottom of the left and/or right foot, light shading for light callouses and dark shading for heavy callouses.



## FOOT APPEARANCE:

### + SEMI-WEIGHT BEARING ARCH

LEFT  High  
 Med  
 Low

RIGHT  High  
 Med  
 Low

### + WEIGHT BEARING ARCH

LEFT  High  
 Med  
 Low

RIGHT  High  
 Med  
 Low

Is there a perceptible change in arch shape between semi-weight bearing and weight bearing? Actual differentiation between what constitutes a high, medium or low arch is not clinically significant. Does the arch shape change from what you determine to be high to medium or medium to low? It is important to note any perceptible change in arch shape.

If it falls somewhere in-between classifications, use arrows to indicate:

HIGH -> MED or MED <- LOW



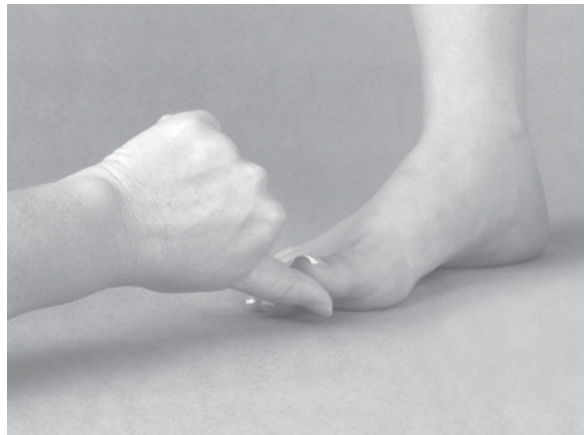
### ◆ HALLUX DORSIFLEXION (CLOSED CHAIN):

LEFT  >9°  
 >4°  
 None

RIGHT  >9°  
 >4°  
 None

Closed chain - the hallux is measured off the supporting surface (horizontal plane).

Be careful to measure the proximal phalanx, as the distal phalanx can dorsiflex further at the distal phalangophalangeal joint.



### ◆ TIBIAL VARUM (IF ANY):

DEGREES:

LEFT \_\_\_\_\_°

RIGHT \_\_\_\_\_°

With the subtalar joint in neutral position, place one edge of an inclinometer along the apex of the tibial crest, at the lower third of the bone.

If the tibia is vertical or up to 4° inverted, the alignment of the bone is within acceptable limits. If it is greater than 4° inverted, the subtalar joint will pronate excessively to achieve ground contact with the medial calcaneal condyle. If the tibia is inverted greater than 7° the amount of subtalar joint motion required to achieve calcaneal contact is pathologic.



## ◆KNEE POSITIONS:

LEFT  Genu Varum  
 Straight  
 Genu Valgum

RIGHT  Genu Varum  
 Straight  
 Genu Valgum

Ask your patient to march in place, then have them bring their feet together until either their knees touch or their malleoli touch.

The knee angle is straight if the malleoli are touching together and there is a two finger space (or less) between the knees. Or if the knees are touching, there should be a finger space (or less) between the malleoli.



## CALCANEAL STANCE POSITION:

### ◆ NEUTRAL SUBTALAR

LEFT  Inverted  
 Rectus  
 Everted

RIGHT  Inverted  
 Rectus  
 Everted

### ◆ RESTING/RELAXED

LEFT  Inverted  
 Rectus  
 Everted

RIGHT  Inverted  
 Rectus  
 Everted

### ◆ HALF SQUAT

LEFT  Inverted  
 Rectus  
 Everted

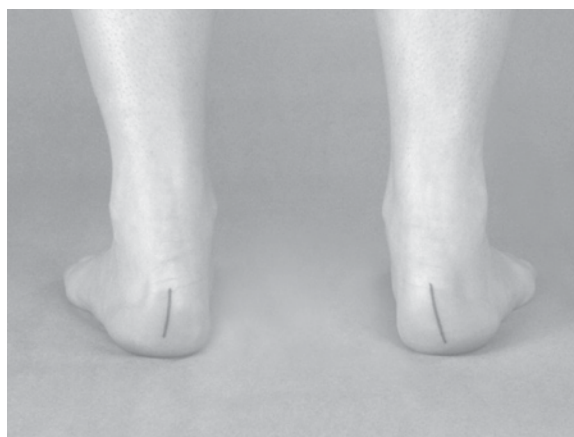
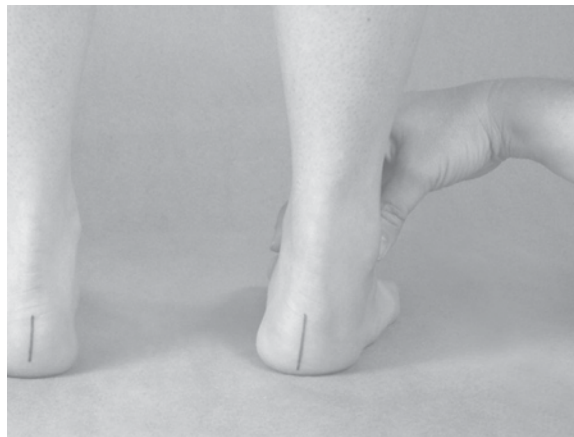
RIGHT  Inverted  
 Rectus  
 Everted

*Rectus* is not vertical. It is within 2° of vertical, either inverted or everted.

Does the calcaneus move from inverted to rectus, or rectus to everted? Does it move from everted to more everted in the half squat? If it does not change more than 2° in any direction, mark the starting position and ending position as the same.

## SHORT LEG (IF ANY):

LEFT/RIGHT \_\_\_\_\_MM/Inches



# NOTES

