ASSESSING THE FEET

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LEARNING OBJECTIVES OF ASSESSMENTS MODULE

- Understand ideal posture and factors affecting posture and the correct environment for postural assessments. Comprehend how to document and interpret postural findings. Review ideal posture and postural factors impacting a client's health and contributing to pain or dysfunction. Identify anatomical relationships and learn tools to assess posture.

Common Deviations Associated With the Foot and Ankle

There are two main deviations that cause pain and injury in the foot and ankle area. They are:

1. Overpronation
2. Lack of dorsal flexion.

Pronation is a normal function in the body that occurs when the foot collapses inward toward the midline of the body. This movement causes the heel to roll inward and the medial longitudinal arch of the foot to elongate and flatten. **Overpronation**, however, occurs when the foot collapses too far inward for normal function and disrupts proper functioning of the entire body.

Dorsal flexion involves bringing the foot toward the shin or visa versa. This can happen when the foot is in contact with the ground, such as when squatting and the shin moves forward over the foot, or when swinging the leg forward and lifting the foot up to clear the ground as when walking. Dorsal flexion is a natural and necessary function of the foot and ankle. When people lose their ability to dorsiflex through a full range of motion, it impairs other movements of the body as well.

FEET/ANKLE ASSESSMENT: ASK CLIENTS ABOUT

Arthritis

Activities (sports, gardening, etc.)

Occupation

Pain? Coincide with other pain or certain activities?

Pain or limitations that stop them from engaging in activities?

What makes pain go away or less intense?

Talk about WHY these things are important!

ANTERIOR VIEW

Begin the assessment by looking carefully at the feet and ankles. Look closely for any swelling, calluses, or irregularities between the feet, ankles and toes.

FEET/ANKLE ASSESSMENT: CONT'D

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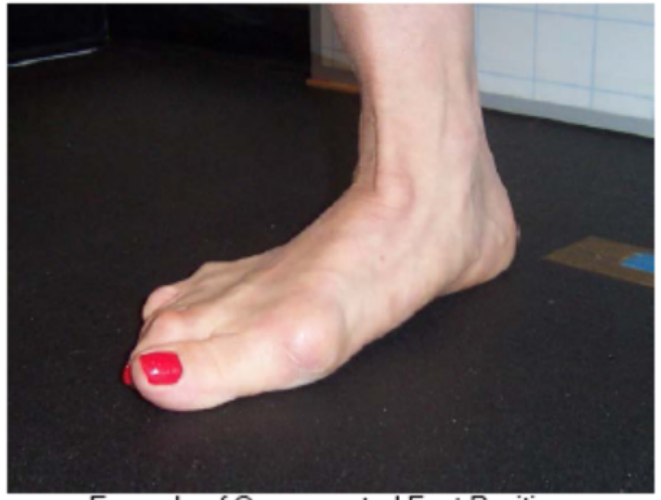


Example of Overpronated Foot Position

Pronation

In order to visually determine the extent and type of pronation in a client's feet, ask the client to stand on both feet facing you. The client's foot may be overpronated if the arch is dropped or absent and/or a bulge of flesh sticks out on the inside of the foot.

FEET/ANKLE ASSESSMENT: CONT'D

Supination

To visually assess the extent and type of supination in a client's feet, look at the top of their feet. If it appears that all their body weight is on the outside of their foot then this may be an indication that the client's feet are oversupinated.

Example of Oversupinated Foot Position

FEET/ANKLE ASSESSMENT: CONT'D

Note: Oversupination is much more rare than overpronation and is much more complex. Because of this, we wont' focus as much on oversupination, but we do want to have a resource for it.

When we get to into fascial release, we'll cover some material that will benefit both overpronation and oversupination. In the meantime, here is a good link for ovesupination:

http://indigokinetics.com/over-supination-exercises/

FEET/ANKLE ASSESSMENT: CONT'D

- An overpronated client may abduct his foot because overpronation causes the knee to move toward the midline of the body. Therefore, the client may turn his foot outward in order to align the knee to face forward. (see pic on next slide)

FEET/ANKLE ASSESSMENT: CONT'D

Example of Abducted Foot Position

FEET/ANKLE ASSESSMENT: CONT'D

Exception: The case just stated is the norm (foot turned away from body to compensate for overpronation to try to point the knee forward). However, if a client is bow-legged (Genu Varum), his knee will naturally point toward the outside of the body. In this case, client may turn the foot inward to try to line up the knee.

Summary: A client with overpronation WITHOUT Genu Varum will usually turn foot outward (abduct).

Client with **overpronation AND bow-legged** condition will usually turn foot inward (adduct).

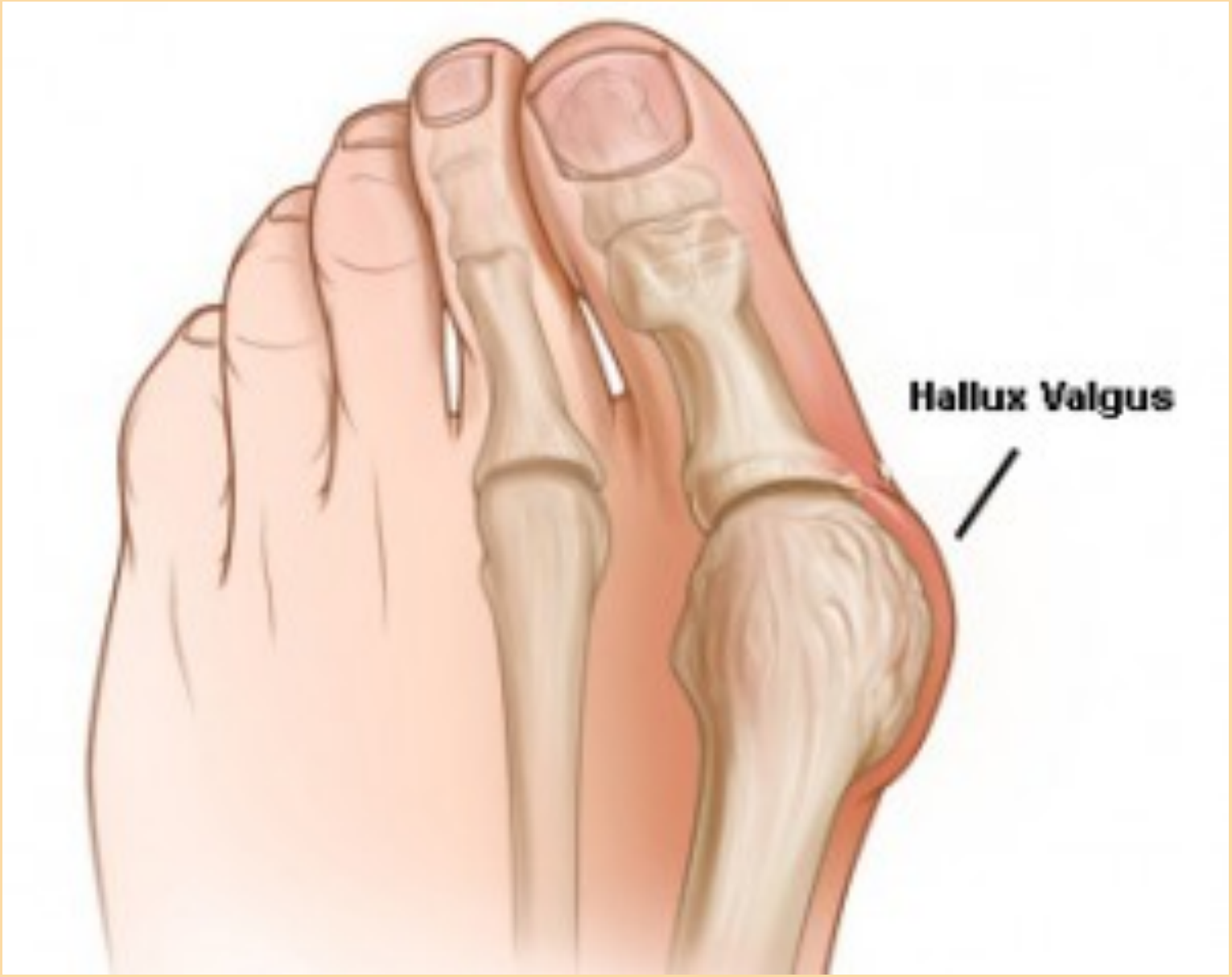
FEET/ANKLE ASSESSMENT: CONT'D

Bunion: Painful swelling on the first joint of the big toe.

Hallux Valgus: This joint is gradually subluxed (lateral deviation of the joint) resulting in an abduction of the first metatarsal while the phalanges adduct(often called one disorder – actually 2 things, but usually are together – bump and abduction). See next slide

Overpronation causes **foot** to **collapse** which transfers weight to center line of body. This **transfer of weight** across the foot **before it can pass over the end of the big toe** can cause inflammation on the inside of the first joint of the big toe **(Bunion).**

Why does overpronation sometimes cause these issues and sometimes not? Possibly genetics. Clients who have bunions may have a short first metatarsal bone and/or hypermobility of the first metatarsal bone or Morton's toe – where the 2nd toe is longer than the big toe.


Hallux Valgus

FEET/ANKLE ASSESSMENT: CONT'D

Lesser Toe Abnormalities:

Hammer Toe: Bends **down toward the floor at the middle toe joint**. This causes the middle toe joint to rise up. It usually affects the second toe. (usually overpronation, improper footware)

Mallet Toe: Bends **down at the joint closest to the tip of the toe**. It often affects the second toe, but it may happen in the other toes too. (usually muscle imbalances, genetics, arthritis, improper footware)

FEET/ANKLE ASSESSMENT: CONT'D

- Lesser Toe Abnormalities:

Claw Toe: Often affects the four smaller toes at the same time. The toes **bend up at the joint where the toes and the foot meet**. They **bend down at the other joints.** This causes the toes to curl down toward the floor. (usually improper footware, muscle imbalance)

FEET/ANKLE ASSESSMENT: CONT'D

FEET/ANKLE ASSESSMENT: CONT'D

Talus Bone Assessment

It is important to assess the position of the talus bone as it sits in the ankle because this will help confirm if the client is overpronated. The talus bone lies in the ankle and helps dissipate some of the side-to-side stress of the foot and ankle during weight bearing activities.

FEET/ANKLE ASSESSMENT: CONT'D

1. To assess the position of this bone, place your thumb and index finger on either side of the ankle just below the ankle bones. You will feel a dimple or indentation on both sides. On the inside of the ankle, the dimple is just below the large tendon of the muscle that pulls the big toe toward the shin (i.e., extensor hallucis). On the outside of the ankle, the dimple lies just below the tendon that lifts the lesser toes toward the shin (i.e., extensor digitorum).

2. Position your thumb and forefinger and press firmly in the center of the dimples on the inside and outside of the ankle. Then ask the client to raise or lower the arch of their foot (pronate or supinate). As they collapse the arch you will feel pressure under your thumb on the inside of the ankle. This is the talus bone pushing into your thumb. As they raise their arch you will feel pressure under your forefinger. This is the talus bone moving the other way. Coach your client to pronate and supinate until the pressure under your thumb and forefinger feels even.

FEET/ANKLE ASSESSMENT: CONT'D

FEET/ANKLE ASSESSMENT: CONT'D

Assessing the Position of the Talus Bone

FEET/ANKLE ASSESSMENT: CONT'D

Instruct	When you feel even pressure on thumb and forefinger, instruct client to hold this neutral position. Let them know neutral positon may feel strange to them if they are used to overpronating, as many of us are.
Have	If available to the client, have him use his hands to feel this – either bending down or on your ankle.
Help	Help him be able to find neutral on his own.

FEET/ANKLE ASSESSMENT: CONT'D

Overpronation causes the foot collapse and the heel to roll inward, pulling on Achilles tendon, gastrocnemius and soleus.

Calf muscles become sore and lose ability to function properly

If calf can't stretch fully, foot and ankle won't be able to dorsiflex. This is why overpronation and lack of dorsiflexion are often seen together (see next slide).

hen the foot overpronates, it causes the tibia and femur to internally rotate a
e heel bone (calcaneus) to fall inward toward the midline of the body (evert) t
uch. Since the Achilles tendon attaches the posterior calf muscles to t
lcaneus, the calf muscles can be pulled out of alignment via the heel when t
ot overpronates. When the calf muscles get pulled and twisted, the tiss
ecomes damaged and begins to lack flexibility. A lack of flexibility in the poster
lf directly impacts the ability of the foot and ankle to dorsiflex. Hen
erpronation is usually accompanied by a lack of dorsal flexion.

FEET/ANKLE ASSESSMENT: CONT'D

Cont'd on next slide

FEET/ANKLE ASSESSMENT: CONT'D

The internal movement of the tibia and femur also result in a medial (inward) displacement at the knee. As the knee moves medially, it can cause stress to the knee joint and may result in tracking problems of the knee where the kneecap (patella) does not glide smoothly as it should. Furthermore, the inward rotation of the upper and lower leg can also cause the top of the femur to be displaced within the hip socket (acetabulum) which affects the movement of the hip, pelvis, and lower back.

FEET/ANKLE ASSESSMENT: CONT'D

Are calf muscles atrophied?

Calf nodules, scar tissue, sore spots?

One calf larger than the other? (Johnson page 61 – could indicate overuse on one side)

Calf Midline (Johnson, page 62)

Achilles tendon positioned over calcaneous? (Johnson, page 63)

Malleoli (Johnson, page 64, 65)

FEET/ANKLE ASSESSMENT: CONT'D

The Plantar Fascia

The plantar fascia is a broad, dense, fairly rigid tissue that runs the length of the underside of the foot and helps give the arches of the feet their shape and structure. Forces from the body above and reaction forces from the ground below put stress on the plantar surface of the foot when a person is weight-bearing, walking, or running. Overpronation places enormous pressure on the plantar fascia and, over time, leads to the tissue becoming overstressed, dysfunctional, and painful.

FEET/ANKLE ASSESSMENT: CONT'D

To assess Plantar Fascia: Press thumb and fingers into the arch and sole of the foot from heel to toe.

Make note of pain/tenderness. May indicate areas of fascia that could benefit from release.

FEET/ANKLE ASSESSMENT: CONT'D

Assessing the Plantar Fascia

FEET/ANKLE ASSESSMENT: CONT'D

Assessment Checklist

Before you move on to assess the knees, you need to have answered the following questions about the feet and ankles:

- ☑ Do you fully understand what type of pain the client is experiencing in their feet and ankles and what affect this has on the function of their feet and ankles?
- ☑ Are the client's feet overpronated?
- ☑ Are the client's feet abducted or adducted?
- ☑ What is the condition of the client's big and lesser toes?
- ☑ What is the condition of the client's calf muscles and plantar fascia?
- ☑ Does the client know how to achieve a neutral foot and ankle position when standing?
- ☑ Do you know how the client's feet and ankles relate to their knees (and can you explain it to your client)?

FEET/ANKLE ASSESSMENT: CONT'D: **SAMPLE CHECK LIST FOR FEET/ANKLES**

CHECKLIST	Y	DETAILS
Feet and Ankles:		
Pain?	Y	lateral R ankle
Arthritis?	N	none reported
Function?	Y	limited dorsiflexion
Aggravating Factors?	Y	running
Causal Links?	Y	medial knee R leg
Visual Irregularities?	Y	slight swelling on inside of R ankle
Pronated?	Y	R foot O/pronated
Ab/Adducted?	Y	R foot abducted
Condition of Toes?	Y	big toe normal, lesser flexed on R foot
Plantar Fascia?	Y	very painful R side
Condition of calves?	Y	tight both sides
Client Knows Neutral?	Y	can attain