

Science Education Collection

Foot Exam

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Overview

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The foot is a complex structure composed of numerous bones and articulations. It provides flexibility, is the essential contact point needed for ambulation, and is uniquely suited to absorb shock. Because the foot must support the weight of the entire body, it is prone to injury and pain. When examining the foot, it is important to remove shoes and socks on both sides, so that the entire foot can be inspected and compared. It is important to closely compare the injured or painful foot to the uninvolved side. The essential parts of the evaluation of the foot include inspection, palpation (which should include vascular assessment), testing of the range of motion (ROM) and strength, and the neurological evaluation.

Procedure

1. Inspection

1. Inspect and compare both fully exposed feet from the front, the side, and from behind.
2. Note any asymmetry, swelling, ecchymosis, and arch deformities.
3. Inspect the skin and nails for evidence of infection, calluses, and corns.
4. Inspect the shoes for abnormal wear patterns.

2. Palpation

With the patient seated, palpate for tenderness, swelling, or deformity in the foot using the tips of the index and middle fingers.

1. Dorsal foot
 1. Palpate the top of the foot, looking for tender spots along the tarsal bones (navicular, cuboid, and three cuneiform bones), metatarsal bones, phalanges, metatarsophalangeal (MTP) joints, and extensor tendons of the toes. Tenderness and numbness between the third and fourth metatarsal heads is seen with a Morton's neuroma.
 2. Palpate the dorsalis pedis pulse in the midline of the mid-foot.
2. Palpate the medial foot along the navicular bone, first metatarsal, and plantar fascia. Bunions may be seen at the first MTP joint from rubbing of shoes.
3. Palpate the lateral foot along the fifth metatarsal bone and toes. A bunionette (prominence at the fifth MTP joint) can be seen from excessive rubbing in this area.
4. Palpate the plantar surface of the foot from the heel pad and calcaneus, moving distally along the plantar fascia, metatarsal heads, and phalanges. Tenderness at the proximal plantar fascia is seen with plantar fasciitis.

3. Range of Motion (ROM)

MTP joints and toes should be assessed first actively and then passively, comparing both feet and checking for limited motion and/or pain.

1. Forefoot abduction (normal ROM: 5°): Grasp the calcaneus with one hand to hold it steady and then using the other hand, push the forefoot laterally.
2. Forefoot adduction (normal ROM: 5°): Grasp the calcaneus with one hand to hold it steady while using the other hand to push the forefoot medially.
3. Great toe extension (normal ROM: 70°) and flexion (normal ROM: 45°): Test actively first by asking the patient to flex and extend the toe and then by grasping the toe and passively extending (dorsiflexing) and flexing (plantarflexing) it.
4. Lesser toes extension and flexion - test active motion by asking the patient to flex and extend all their toes at the same time, while comparing sides, and the passive motion by pushing each toe up and down with your fingers, comparing between the sides.

4. Strength Testing

Strength testing is performed as resisted isometric movements. Check for muscle weakness and/or pain.

1. Resisted great toe extension is tested by pushing down on the toe against resistance to check the extensor hallucis longus, which is innervated by the peroneal nerve.
2. Resisted great toe flexion is tested by asking the patient to flex their big toe while you try pull it into extension. This tests the flexor hallucis longus, which is innervated by the tibial nerve.
3. Resisted lesser toe flexion and extension are generally done testing all toes at once in a similar fashion as above.

5. Sensation

Assess the sensation in the foot by lightly touching it with your fingertips in the following areas and comparing one side to the other for deficits.

1. Lateral border of the foot (innervated by the sural nerve).
2. Web space between the first and second toe (innervated by the deep peroneal nerve).
3. Dorsum of the foot (innervated by the superficial peroneal nerve).
4. Plantar aspect of the heel and foot (innervated by the posterior tibial nerve).

Summary

Examination of the foot is best done with the patient first in a standing and then sitting position. The exam should follow a stepwise approach, and it is important that shoes and socks be removed from both of the patient's feet to allow easy inspection and comparison. The exam should begin with inspection, looking for asymmetry between the involved and uninvolved foot. Palpation of key structures is done next, looking for tenderness, swelling, or deformity. This is followed with assessing ROM in the forefoot and toes, first actively and then passively. Next, the same motions are tested against resistance to assess the strength and look for pain or weakness. Finally, the sensation across the dorsal and plantar surfaces of the foot is assessed by lightly touching in these areas.