



Al-Mustaqbal University
Collage of Engineering
Prosthetics and Orthotics Engineering
Second Stage

ORTHOTICS I

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ANKLE FOOT ORTHOSIS (AFO)

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INTRODUCTION

- AFO is an orthosis or brace (usually plastic) that surrounds the ankle and at least part of the foot.
- AFOs are externally applied and intended to control position and motion of the ankle, compensate for weakness or correct deformities
- There are several different ankle-foot orthoses (AFO) used to provide ankle stability for pathological gait patterns.



PLASTIC DESIGN

- Plastic designs are becoming more popular than the conventional double metal uprights with mechanical joints attached to the foot wear. The advantages of plastic over the conventional metal jointed AFO's are:
 - Orthosis weight and bulk are reduced
 - Improved cosmetics
 - Improved control of the ankle/foot complex through an initial fit
 - Inter-changeability of foot wear.



AFO IN HISTORY

- Historically, the design of AFOs has been dictated by the available material.
- When first produced metal was the only suitable material.
- Then plastic became available resulting in lighter AFOs, a great innovation.
- It has provided contact with the leg, giving much better control, which is not feasible with metal.

DROP FOOT

- Drop foot is an abnormal neuromuscular disorder characterized by a stoppage gait that affects the patient's ability to raise their foot at the ankle.
- It is further characterized by an excessive and uncontrolled plantarflexion, an inability to point the toes towards the body (dorsiflexion) or move the foot at the ankle inwards or outwards.
- The drop foot motion will lead to toe dragging during the swing phase of the gait cycle and result in pain and weakness. Moreover, numbness may accompany loss of function.





Physio Study

Drop-Foot Gait

CONT.

- Drop foot is a reduced or lack of action from the muscles that lift the foot.
- When these muscles have a lack function, they are unable to dorsiflex the ankle which causes the foot to be dragged on the ground.
- For some people the lack of function is so severe that they are not able to walk without treatment, while others have a stoppage gait.
- The recommended treatment depends on the etiology of drop foot.
- Sometimes surgery is necessary while some patients can be treated by wearing an ankle foot orthosis, a brace that stabilizes the foot and lifts it in an upright position while the foot swings.

FOOT DROP BRACES AND SPLINTS (ORTHOSES)

- Orthoses, such as a drop foot brace or splint, are often the first line treatment by providing stabilization of the ankle and the foot.
- An Ankle-Foot-Orthosis (AFO) can be used to keep the dropped foot off the ground while walking if the patient has the functional use of their muscles. This creates a more even and more normal gait.
- A brace for foot drop is used to keep the ankle at 90 degrees and prevents the foot from dropping toward the ground.
- The drop foot brace makes it easier for the patient to walk and more difficult to trip.
- The most common type of foot drop brace is made of polypropylene and is inserted into a shoe.

