

## CLINICAL COMMENTARY

## MIDFOOT AND FOREFOOT INVOLVEMENT IN LATERAL ANKLE SPRAINS AND CHRONIC ANKLE INSTABILITY. PART 1: ANATOMY AND BIOMECHANICS

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## ABSTRACT

The modern human foot is the culmination of more than five million years of evolution. The ankle-foot complex absorbs forces during loading, accommodates uneven surfaces, and acts as a lever for efficient propulsion. The ankle-foot complex has six independent functional segments that should be understood for proper assessment and treatment of foot and ankle injuries: the shank, rearfoot, midfoot, lateral forefoot, and the medial forefoot. The compliance of the individual segments of the foot is dependent on velocity, task, and active and passive coupling mechanisms within each of the foot segments. It is also important to understand the passive, active, and neural subsystems that are functionally intertwined to provide structure and control to the multisegmented foot. The purpose of the first part of this clinical commentary and current concepts review was to examine foot and ankle anatomy, detail the roles of the intrinsic and extrinsic foot and ankle musculature from a multisegmented foot perspective, and discuss the biomechanics of the ankle-foot complex during function. The interplay of segmental joint mobility, afferent and efferent sensorimotor function, and movement and stabilization provided by the extrinsic and intrinsic musculature is required to coordinate and execute the complex kinematic movements in the ankle-foot complex during propulsion.

**Key Words:** intrinsic foot muscles, gait, joint mobility, kinematics, ambulation

**Level of Evidence:** 5

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