H14 Sex and Stature Estimation Based on the Calcaneus, Talus, and Metatarsal Length

Dawn M. Strohmeyer, MS, 12 Bridge Street, Hitchin, Hertfordshire SG5 2DE, United Kingdom; and Tal L. Simmons, PhD, Department of Forensic and Investigative Science, University of Central Lancashire, Preston, Lancashire PR1 2HE, United Kingdom*

After attending this presentation, attendees will understand an alternative method to sex determination and stature estimation based on the bones of the feet.

This presentation will impact the forensic community and/or humanity by demonstrating a means to aid in identification when remains are in a poorly preserved state allowing the investigator to determine sex and estimate stature based on the resilient bones of the feet.

It has long been known that a relationship exists between lower long limb bone lengths and stature; this is often used to estimate stature. However, on occasion an individual is only represented by fragments of the long bones, or the smaller, more compact bones of the feet. Although a relationship exists between the maximum length of these bones and an individual's height, very little research documents the utility of estimating stature from foot bones.

The purpose of this study was to provide investigators with stature regression formulae for use on the bones of the feet. Using the maximum length measurement of the right and left calcaneus, talus, and all ten metatarsals of 200 individuals (50 each of White females, White males, Black females, and Black males) from the Terry Collection, discriminate analyses were performed to confirm significant differences existed between the groups used in this study. Regression analyses followed which produced formulae to estimate stature based on race and sex for use when intact lower limb bones are not present.

Results from this study indicate that the foot bones are poor in their predictability of sex, race, and stature. However, when other methods of sex and stature estimation are unavailable, the bones of the feet provide a possible alternative method. In this study, more accurate sex determination was achieved based on the measurements for blacks than whites. Stature regression formulae from the foot bones of black females were found to be at least as accurate as those for metacarpals and fragmentary limb bones; foot bones from the other groups were not as accurate.

Ultimately, the aim of this study was to aid in the identification of servicemen from the Vietnam and Korean Wars who are recovered from archaeological contexts with poor skeletal representation or preservation. The robust and compact nature of the foot bones used in this study allows them to be recovered, especially in a burial or internment context. Therefore, this investigation was completed on these bones in order to offer investigators an alternative method of stature estimation when the use of other methods is not possible.

Stature, Metatarsals, Calcaneus

 ** Presenting Author*