E10   Forensic Podiatry—An Overlooked Science in the Analysis of Feet, Footprints, Gait, and Tracks

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Learning Overview: After attending this presentation, attendees will have learned the scientific principles of the important and emerging forensic science subdiscipline of forensic podiatry, which pertains to the examination, interpretation, and evaluation of pedal evidence (in particular, footprints, footwear, gait, and tracks) often encountered at crime scenes.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing forensic scientists insight into and a greater understanding of additional methodologies and tools available to them—either directly or through consultation with a forensic podiatrist—to assist in the analysis of footprints, footwear, tracks, and human remains, and importantly, an understanding of how these principles may be applied to a wide—and growing—number of other scientific and forensic specialties.

Forensic podiatry is a comparatively new scientific subdiscipline of forensic science that emerged in the 1970s through anecdotal observations. Now, 50 years later, its principles are grounded in substantial, researched science. Forensic podiatry has been defined as the application of sound and researched podiatric knowledge and experience in forensic investigations, to show the association of an individual with a scene of crime, or to answer any other legal question concerned with the foot or footwear that requires knowledge of the functioning foot.[1]

This presentation will present the utility of an overlooked forensic science and advance to forensic scientists an additional, powerful tool for their armamentarium, which can be directly utilized for analysis of pedal evidence associated with crimes or as an adjunctive application, supplementing a growing number of other scientific and forensic specialties.

Forensic podiatry principles are used to establish identification and biologic profiles in crime scene investigations when foot-related and gait evidence is recovered from the crime scene, such as individual footprints, tracks of footprints, an item of footwear, or when surveillance video captures the perpetrator's gait (i.e., the way they walk). The need to establish the identity of dismembered remains may also arise, not only in the criminal context but in mass disasters or mass fatality incidents. In this regard, forensic podiatry methods can assist in identification from the decedent's foot and its parts. Beyond the criminal context, forensic podiatry principles have utility in other scientific areas, including medicine, biomechanics, engineering, biology, and anthropology.

The scientific methodologies developed within forensic podiatry can be utilized to analyze footprints and tracks—gait patterns—recovered at crime scenes or associated with crimes. Using such forensic podiatry tools will allow the examiner to determine activities that were carried out by persons during the crime and also allow the linking (or unlinking) of individual footprints to suspects.

Forensic podiatry procedures of footprint analysis frequently entail a systematic identification of features, such as corns, pits, ridges, humps, creases, hammertoe deformity, an extra toe, missing toe in the foot impression, and flat footedness; as well as morphologic and anthropomorphic characteristics, such as linear measurement methodologies, to provide estimates of stature, sex, body weight, and other biologic profile attributes. Tracks found at crime scenes can be analyzed through forensic podiatry's gait analysis principles, which include evaluating such measures as step and stride length and base of gait.

Reference(s):
1. Vernon, Dennis W., and John A. DiMaggio. *Forensic Podiatry—Principles and Methods*. Boca Raton: CRC Press, Taylor and Francis Group, 2017.

Forensic Podiatry, Crime Scene Investigation, Identification

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