Ability of Lower-Extremity Injury Severity Scores to Predict Functional Outcome After Limb Salvage

**Reference:**

**Scientific Literature Review**

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**Podiatric Relevance:**  
Lower extremity injury scoring systems are commonly used to help guide a podiatric surgeon’s decision on whether to amputate or salvage a severely injured extremity. However, recent studies show these scoring systems to be poor predictors of limb amputation or salvage. This article investigates whether these scoring systems can predict the functional outcome of a successfully salvaged limb. They hypothesized that a higher injury severity score would be associated with poorer functional outcome.

**Methods:**  
To investigate the hypothesis, 407 patients with successful limb salvages were selected from a larger multicenter prospective cohort study called Lower Extremity Assessment Project (LEAP). The inclusion criteria were based on the degree of injury including selected injuries of the distal tibia and the foot. Exclusion criteria were based on time elapsed from injury to treatment, previous amputations, etcetera. Severity of injury was assessed using 5 common scale systems (Mangled Extremity Severity Score [MESS], Limb Salvage Index [LSI], Predictive Salvage Index [PSI], Nerve Injury Ischemia Soft-Tissue Injury Shock and Age of Patient Score [NISSSA], and Hannover Fracture Scale-98 [HFS-98]). Functional outcome was assessed at 6 and 24 months using the Sickness Impact Profile (SIP), a validated self-reported system measuring physical and psychosocial health.

**Results:**  
Age-adjusted associations between injury severity scales and SIP scores were weak. There were no significant correlations between injury scales and psychosocial SIP scores, although the MESS scale had a significant age-adjusted correlation with physical SIP scores. Additionally, the limited trends between injury scales and SIP scores were non-coherent. There was no difference in SIP outcomes between patients who were recommended amputation versus those recommended limb salvage.

**Conclusions:**  
This study finds that lower extremity injury severity scales are not predictive of functional recovery for patients who have undergone successful limb salvage reconstruction. However, these findings should be interpreted with caution as this study was conducted at level-1 Trauma centers where access to high level of interdisciplinary care and technology is more feasible. Factors from this study may differ from that of an average podiatric surgeon, such as the surgeon’s expertise in limb salvage reconstruction, available technologies and the degree of interdisciplinary relations at the surgeon’s institution.