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# Reproducibility assessment of the Lauge-Hansen, Danis-Weber and AO classifications of ankle fractures

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## ABSTRACT

**Introduction**: Although there are some studies on the reproducibility of various classifications of ankle fractures, they are controversial and lack consensus on which classification is the most appropriate. Thus, the objective of this study is to identify which of the 3 main ankle fracture classifications has the highest intra- and interobserver reproducibility and to assess whether the medical training stage of the participants affects the evaluation.

**Methods**: Radiographs of 30 patients with ankle fracture in anteroposterior (AP), profile and true AP views were selected. All images were evaluated by 11 participants at different stages of their medical training (5 residents and 6 orthopedic surgeons) and at 2 different times. Intra- and interobserver agreement was analyzed using the weighted Cohen's kappa coefficient. Paired Student's t-tests were performed to assess whether the degree of interobserver agreement significantly differed between classification methods.

**Results**: The results showed significant agreement in all classifications when analyzing intraobserver agreement alone. The Danis-Weber classification showed a highly significant ($p<0.0001$) moderate-to-excellent interobserver agreement. The Danis-Weber classification had, on average, a significantly higher degree of agreement than the other classification methods ($p<0.0001$).

**Conclusion**: The Danis-Weber classification had the highest reproducibility among the classification methods evaluated in this study.

**Keywords**: Ankle fractures; Classification; Reproducibility of results.