

Dental radiographic matching – A comparison of practitioner performance using a forced decision model, ABFO, DVISYS and Interpol Identification Scales

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ABSTRACT

The aim of this study was to assess the accuracy of antemortem / postmortem radiographic matching by dentists and forensic odontologists using a web-based interface as part of a project to assess the reliability of odontology. The study utilised 50 pairs of AM and PM radiographs from real casework, verified by DNA, at varying degrees of difficulty. Participants were shown both radiographs as a pair, and asked to decide if they represented the same individual. Participants were asked to assess their level of confidence in their decision, and to assign one of the ABFO, INTERPOL or DVISYS identification scale points. The mean false-positive rate using the yes/no scale was 12%. Overall accuracy was 89% using this model. However, 13% of participants scored below 80%. Only 25% of participants accurately answered yes or no more than 90% of the time. No individual made the correct yes/no decision for all 50 pairs of radiographs. Use of the graded ABFO, DVISYS and INTERPOL scales resulted in general improvements in performance, with the false-positive and false-negative rates falling to around 2% overall. Yet inter-examiner agreement in assigning scale degrees was moderate, and varied with the apparent difficulty of the match task. There was little correlation between confidence and both accuracy or agreement among practitioners. These results suggest that use of a non-binary scale is supported over a match / non-match call as it reduces the frequency of false positives and negatives. Use of the term “possible” and “insufficient information” in the same scale is proven redundant in this study, and appears to create confusion, reducing inter-examiner agreement. This study represents an important step in validating odontology opinions for identification, yet confidence does not correlate well with accuracy and should not be a factor considered by the reconciliation board when attempting to establish identification.