

## **Assessing the reliability of kerf floor shapes in predicting saw types for use in forensic dismemberment cases**

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Forensic anthropologists commonly assess the floor shapes (kerf) of the bony cuts left by saws in cases of human dismemberment. Kerf shape is thought to reflect characteristics specific to the class of saw utilized to make the cuts. In this study, a set of 12 kerf shape categories was created based on previous studies and observations. These categories were used to test interobserver agreement of kerf floor assignments and in the evaluation of the kerf shape/saw characteristic relationship. This research utilized a 90-specimen subsample of incomplete saw cuts on fully macerated human long bones made available by Mercyhurst University and originally collected as part of a National Institute of Justice grant project (2005-IJ-CX-K016). The 19 saws used to make these cuts were semi-randomly selected to ensure approximately equal representation of each saw. Stereomicroscopic photos of the kerf profiles from these 90 specimens were scored by three observers. Agreement between the two inexperienced observers and the experienced observer was 60.0% and 75.6% for the 12-shape scoring system. Collapsing the kerfs with flat or slightly rounded floors increased agreement to 90.0% and 88.8%. Other than being made by rip saws, no patterns were discerned between the flat/rounded kerf floors and saw characteristics. Kerfs with a “W” or truncated-“W” shape had 100% agreement across all observers. All but one of the W-shaped kerfs were created by hand saws with alternating crosscut teeth. This preliminary research highlights the utility of kerf floor shape analysis and illustrates the need for further kerf floor shape assessment.