



### A47 Recording Total Skeletal Completeness: Introducing a New Approach

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After attending this presentation, attendees will better understand a new standardized and objective method for recording skeletal completeness.

This presentation will impact the forensic science community by providing an improved method for recording total skeletal completeness in osteological analyses of adult individuals. This presentation will also illustrate the value, and provide an example of one possible application, of Computed Tomography (CT) volume-rendering techniques for forensic anthropological research.

Recording the preservation (condition and completeness) of human skeletal remains is the foundation of osteological analyses for forensic and archaeological skeletal material. Guidelines for the recording of skeletal preservation typically include a statement on the total skeletal completeness; that is, how much of the total skeleton is present for analysis. This component of skeletal preservation recording is essential as the quantity of the skeleton preserved determines the extent to which it is possible to develop a biological profile and provide an interpretation about skeletal trauma; however, current osteological methods for recording the total skeletal completeness are non-standardized and subjective. In order to provide practitioners with an objective and standardized means to accurately quantify the total skeletal completeness preserved in an adult skeleton, percentage values for each skeletal element have been established and can be applied to the skeletal remains of any adult individual.

Percentage values for each skeletal element were calculated by establishing the proportion of the volume of each bone relative to the total volume of a complete skeleton. The postmortem CT scan of a young adult male (undertaken with a 128-row helical CT, the SOMATOM® Definition Flash, as part of the Victorian Institute of Forensic Medicine's routine autopsy process) was used. Volume measurements for each skeletal bone and the complete skeleton were generated using Philips IntelliSpace Portal, V7, CT visualization software. The proportion of each skeletal element relative to the complete skeleton, and their subsequent conversion into percentage values, was calculated using basic descriptive statistics.

Percentage values ranged from 0.01% (select hand and foot bones) to 10.83% (cranium). A variety of mediums (visual, written, and an application designed for mobile operating system devices) are provided to ensure the user-friendly calculating of percentages.

Results of this study will provide an accurate and objective means of calculating total skeletal completeness; a component of skeletal preservation recording that is important in medicolegal contexts (to guide recovery operations and provide information about the deceased to their family) and in archaeological contexts (influence the outcomes of research).

#### **Total Skeletal Completeness, Percentages, Volume Rendering**