



### **A8 A Qualitative Assessment of Bilateral Pubic Symphyseal Face Asymmetry Using the Suchey-Brooks Method for Adult Age-at-Death Estimation**

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After attending this presentation, attendees will gain an understanding of how bilateral asymmetries influence age-at-death estimations using the Suchey-Brooks Method.

This presentation will impact the forensic science community by serving as a follow-up to Overbury et al., further exploring how intra-observer error contributes to differing age-at-death estimates between right and left pubic symphyseal faces using the Suchey-Brooks Method.<sup>1,2</sup>

Accurate and precise age-at-death estimation is critical to the construction of a biological profile in both forensic and archaeological contexts. Most methods for adult age estimation have been developed using North American skeletal collections from the early to mid-20th century and are based on progressive developmental and degenerative changes in bone tissues. Recent research indicates that these morphological skeletal changes may progress asymmetrically, complicating age-at-death assessments when there is a discrepancy between right and left pair elements or when age indicators are unilaterally represented.<sup>1</sup>

The pubic symphysis is often considered the best indicator of skeletal age.<sup>3,4</sup> Given its widespread use, the Suchey-Brooks method for adult age-at-death estimation was selected to qualitatively examine asymmetry of the os pubis.<sup>2</sup> For direct comparison with previous research, the method of recordation and the definitions of asymmetry followed Overbury et al.<sup>1</sup> The study sample was comprised of 142 White males from the J.C.B. Grant Collection, curated at the University of Toronto. This includes all of the male skeletons in the collection with well-preserved right and left pubic symphyseal faces. The documented age range of the sample is 23-90 years, with a mean age of 60.9 ( $\pm$  15.1 SD) years. This study tests the accuracy of the Suchey-Brooks Method on a known age sample and evaluates whether pubic symphyseal face antimeres produce differing age estimates. This study explores whether bilateral asymmetry is a source of error in the Suchey-Brooks phase system.

Contrary to Overbury et al., asymmetries did not appear to affect adult age-at-death estimations using the Suchey-Brooks Method.<sup>1</sup> Individuals were placed into the “correct” Suchey-Brooks phase 64% of the time, irrespective of side. (Phase scorings were considered “correct” when specimens were assigned to the phase with the mean age closest to the verified age). Phase scores, as well as inaccuracy and bias scores, for the right and left pubic symphyseal faces are not statistically different. Asymmetry and intra-observer error was found to be correlated, suggesting that user experience may influence the prevalence of disparate age estimates between right and left pair elements. While this study does not preclude the existence of bilateral asymmetries at the pubic symphysis, quantitative work on pelvic asymmetry suggests that bilateral differences are likely to be inconsequential in an asymptomatic population and rather manifest as measurement artifacts.<sup>5</sup> This would indicate that the differences between the left and right sides are more likely to be due to observer error (or random chance) rather than an actual effect of pelvic asymmetry itself.

In order to provide the most reliable age-at-death estimations, antimeres should be analyzed together whenever possible. If this is not possible, the use of either the right or left pubic symphyseal face seems justified.

Future research directions include expanding the study sample to incorporate additional younger adults, females, and multiple ethnicities. It would also be interesting to couple qualitative with metric assessments of asymmetry, as well as to examine the correlations between pelvic asymmetry and asymmetries of the lower limb.



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## References:

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## Pubic Symphysis, Pelvic Asymmetry, Skeletal Aging Methods