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## The validity of osteoarthritic markers to contribute to age-at-death estimation in forensic anthropology: Employing an Eastern American sample

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Osteoarthritis is the most common joint disease affecting the human skeleton. A growing body of literature has assessed the use of osteoarthritic markers to assist in the estimation of age-at-death in physical or forensic anthropology. Current aging methods in adults include the observation of the pubic symphysis, the auricular surface of the ilium, and sternal rib ends, which often result in broad age ranges encompassing young as well as older adult individuals, and have decreasing predictive power as age increases. The prevalence or absence of osteoarthritis in the human skeleton could assist in providing more accurate age estimations after the fourth decade of life and may have useful applications to partially recovered remains in a forensic setting. This study aimed to assess the presence of osteoarthritis in a sample of 120 skeletonised individuals with known age-at-death between 25 and 99 years from the William M Bass Donated Skeleton Collection house at the University of Tennessee's Forensic Anthropology Center (FAC). Using a modified version of a previously published osteoarthritis scoring system, evidence of osteoarthritic markers were recorded of the hip, knee and shoulder joints, totaling 1852 observations. A Bayesian network was used to produce a novel tool for estimating the age-at-death in unknown cases. Preliminary results suggest that osteoarthritic markers are strongly correlated with age, with a presence in the >40 year old and therefore may serve, once again, as a useful complimentary method to assist in the estimation of age-at-death in a forensic context.

### Biography

Giles S is a Crime Scene Investigator for Thames Valley Police, the largest non-metropolitan police force in the UK and a part-time Forensic Anthropology PhD student at Cranfield University, Defence Academy of the United Kingdom. She has been an operational Crime Scene Investigator since February 2014 and has so far examined approximately 600 crime scenes. She holds a distinction MSc in Forensic Anthropology and Archaeology and a First Class BSc in Medical Sciences from the University of Leeds. During her MSc, she secured a research scholarship at the Anthropology Research Facility ("The Body Farm"), Knoxville, University of Tennessee. Here she developed a new method to estimate the time since death from decomposition states and conducted research utilising the William Bass Skeletal Collection. Following her Master's, she was awarded the "Forensic Science Society Prize", "Head of School Prize", "Inforce Prize", "Top Student on the Forensic Programme Award" and the "Cranfield Forensic Institute Distinction Prize". She holds Associate Membership of the Chartered Society of Forensic Sciences.

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