

as osteoarthritis on articulation are unknown. These pathologies often exclude the use of traditional methods, warranting the development of new techniques to reassociate affected commingled remains.

The goal of the study was to evaluate the expression of osteoarthritis as a possible tool for sorting commingled remains. Medical literature indicates that the expression of osteoarthritis is consistent within an individual across joint surfaces in autopsy and surgical patients; however, bioarchaeological literature shows the variation in expression of the pathology is dependent on the method used to identify it.<sup>1</sup> To insure consistency in scoring osteoarthritis, the authors used the criteria published by Buikstra and Ubelaker to determine presence of osteoarthritis and the criteria established by Jurmain to determine the severity of the joint disorder.<sup>2,3</sup>

For this study, 258 discrete individuals from the Phoebe A. Hearst Museum of Anthropology were examined. The individuals included in the study were aged 30 years or older and had 50 percent of two or more surfaces from the same joint. The degree of lipping, eburnation, and porosity was examined in each synovial joint of the skeleton and a severity score was assigned that described the joint degeneration.

Overall, the majority of the osteoarthritis was expressed as marginal lipping and porosity; therefore, many of the joint surfaces were scored with a severity score of one. Chi-square tests were used to analyze the frequency of osteoarthritis in the hip, knee, elbow, and shoulder. The results showed that presence of osteoarthritis was consistent across surfaces of a joint. For example, the radial head was not marked with osteoarthritic changes if the capitulum of the humerus was not. Similarly, the medial condyle of the tibia was likely scored as one if the medial condyle of the femur was scored as one.

The study showed that osteoarthritis is a useful tool to reassociate commingled skeletal remains; although, it is most useful when used in conjunction with other techniques. While pathology of the joint surface may preclude the use of other methods such as the measurement of joint surfaces, joint pathology is a valid criterion to reassociate discrete individuals. This study only examined osteoarthritis; future studies should evaluate other pathological conditions.

Despite a great deal of past research, there is a need to develop additional tools to facilitate reassociation of discrete individuals. Future studies should investigate joint surface pathologies from modern and archaeological collections to increase our understanding of these pathologies and their value for reassociating commingled remains.

#### References:

1. Lagier R. Bone eburnation in rheumatic diseases: a guiding trace in today's radiological diagnosis and paleopathology. *Clin Rheumatol* 2005;25:127-31.
2. Buikstra JE, Ubelaker, DH. Standards for data collection from human skeletal remains. Proceedings of a Seminar at the Field Museum of Natural History. Fayetteville (AR): Archaeological Survey Press, 1994.
3. Jurmain R. Paleoepidemiology of a central California prehistoric population from CA-ALA-329: II: degenerative disease. *Am J Phys Anthropol* 1990;83:83-94.

#### Commingling, Mass Burials, Joint Pathology

## H21 The Power of Contextual Effects: A Study of Biasability in Visual Interpretations of Trauma Analysis on Skeletal Remains

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After attending this presentation, attendees will understand how contextual information can bias assessment of trauma images.

This presentation will impact the forensic science community by demonstrating how bias can impact forensic anthropology and how

contextual information can affect objective assessments by scientists with a range of experience and ability.

The potential for contextual information to bias assessments in the forensic sciences has been demonstrated, focusing on the DNA, ballistics, and friction ridge analysis disciplines. This has been discussed in the National Academy of Sciences Report, *Strengthening Forensic Science in the United States: A Path Forward*. However, in many forensic disciplines, such as anthropology, the presence of bias, its impact on objectivity, and how to mitigate its effects is still not fully assessed or appreciated. Effects that may impact the judgment and decision-making of forensic anthropologists need to be measured. No studies have been performed within the discipline assessing possible biasing effects within visual analysis.

Biasability potential within forensic anthropology was examined by constructing an experiment that analyzed the effects of external manipulations on judgment and decision-making in visual trauma assessment. Three separate websites were created containing 14 identical images of skeletal remains presenting a range of trauma. Each website presented participants with different contextual information. The three separate contexts described human rights mass grave excavations, a 19<sup>th</sup>-century archaeological excavation setting, and a control scenario with no specific contextual information provided. Ninety-nine participants were equally distributed and randomly assigned to one of the three scenarios. Participants completed a survey noting qualifications and experience, and were asked to assess the presence of trauma in the images and to describe their confidence in their interpretation by scoring for level of certainty. The interpretation of presence of trauma was assessed to determine if it would differ for the same images across the different scenarios.

The results indicated a bias correlation between the three scenarios, indicating a higher likelihood of identifying trauma within the mass grave excavation context. A significant biasing effect was associated with four of the images, notable for their ambiguous and distinct nature. Participants with less experience were more likely to interpret the presence of trauma. This research demonstrates that bias can be detected in the field of forensic anthropology, highlighting the importance of recognizing issues that may influence interpretation during investigation and analysis, as well as the need for further research on how to mitigate these effects.

#### Anthropology, Bias, Trauma Assessment

## H22 Did I Teach Them That? Setting and Assessing Goals for Student Learning for an Introductory Forensic Anthropology Course

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After attending this presentation, attendees will be able to describe an appropriate goal for an introductory forensic anthropology course as well as the format of the assessment tool used in this presentation.

This presentation will impact the forensic science community by disseminating information regarding a technique for determining the effectiveness of forensic anthropology (or other science) courses.

In this presentation, a technique used for several years for assessing student learning in an introductory forensic anthropology course is described. This technique begins with a statement of the goals of the course, followed by design and implementation of a tool for determining if particular goals have been met. After viewing this presentation, observers should be able to describe an appropriate goal for an introductory forensic anthropology course and describe the format of the assessment tool used in this presentation. This presentation will have an impact on educators in the forensic science community by disseminating a technique for determining the effectiveness of forensic anthropology (or other science) courses.