

The value and availability of forensic anthropological consultation in medicolegal death investigations

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Accepted: 9 June 2015 / Published online: 1 July 2015
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Forensic anthropological analysis is a valuable component of medicolegal death investigations. Like many other forensic sciences, forensic anthropology has become increasingly sophisticated in recent years, requiring qualified practitioners to complete intensive and long-term post-graduate study. In addition, forensic anthropology has experienced a recent increase in interest (facilitated in part by increased media attention), with the result that many are now much more aware of the nature and value of forensic anthropological services. While the number of qualified and certified forensic anthropologists is increasing, a

misconception by a few in the medicolegal community that the numbers of forensic anthropologists cannot properly meet the consultation needs of medical examiner and coroner offices appears to exist, and moreover that anthropological services are often cost-prohibitive. Here we present an overview of the current state of forensic anthropology, including the typically available services, education and training requirements, as well as some information and suggestions for ways in which forensic pathologists and coroners can seek forensic anthropological consultation. Forensic pathology and forensic anthropology are both highly specialized fields with extensive education and training requirements, and a collaborative approach results in the most reliable and scientifically accurate forensic results. This collaboration is eminently achievable.

Forensic anthropology is the science of applying anthropological method and theory to matters of medicolegal concern. Many are familiar with the traditional uses of forensic anthropology including estimation of the biological profile (age, sex, ancestry, stature) from unknown skeletal remains and the assessment of skeletal trauma. The science of forensic anthropology, however, has experienced a significant increase in sophistication and breadth in recent years. Depending on the training and interests of the individual anthropologist, as well as the resources of the institution by which they are employed, anthropological examinations may include search and recovery of human remains, the determination of skeletal versus non-skeletal origin, the determination of human versus non-human origin, the assessment of forensic significance of human remains, estimation of various biological parameters (including sex, age, ancestry, stature, as well as skeletal anomalies, pathologies and other conditions), trauma analysis, and personal identification (typically by radiographic comparison).

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While many traditional laboratory analyses involve visual examinations and calculations based on bone dimensions, the role of the forensic anthropologist today has expanded and frequently involves a suite of sophisticated technologies and instrumentation including total station and GPS for field data collection, GIS mapping and spatial analysis, metric analysis software, digitizers, laser scanners, alternate light sources, specialized photography (including infrared and ultraviolet), X-ray fluorescence spectrometry, microscopy, histology, radiology, stable isotope analysis, and radiocarbon dating. Education and training programs are therefore often intense and diverse, with many American anthropology departments taking a holistic approach to teaching anthropology requiring students to study not only forensic applications of anthropology, but also physical, archaeological, and cultural anthropology. The Scientific Working Group for Forensic Anthropology (SWGANTH) has published a rather extensive list of required and recommended university coursework and training for aspiring practitioners [1]. In the medicolegal setting, the use of trained forensic anthropologists protects against inadequate or inappropriate analyses. Forensic anthropologists bring a diverse skill set to medicolegal investigation that is applicable to all stages of the investigation, with increasingly specialized education and technology.

Forensic anthropology is certainly not alone in its increasing sophistication. As with other areas in forensic science, use of specialized knowledge and technological advancement is coupled with the responsibility to obtain proficiency and maintain competency. With changes in the political and legal landscapes such as rulings like *Daubert* [2] and the 2009 National Academy of Sciences report [3], it is no longer realistic for a crime laboratory or investigative office to employ a handful of individuals with wide-ranging expertise in numerous forensic science disciplines. The NAS report in particular emphasized the need for specialty experts in the various fields, and called for the certification of practitioners and accreditation of the laboratories in which they perform their analyses. The current level of sophistication of many forensic sciences (and the amount of education and training necessary to master them) requires that individuals specialize and become experts in a particular field, often working in collaboration with other forensic experts to best exploit the available forensic evidence for the most scientifically accurate results. Even for very closely related fields (such as pathology and anthropology, and to some extent entomology and odontology), advanced specialized education is necessary to acquire the appropriate level of expertise and to meet minimum standards for certification. In fact, legal experts have recommended that a PhD in a particular field be considered a minimum qualification for forensic scientists [4].

Because of the closely-related nature of their two fields, forensic pathologists and forensic anthropologists are involved in many of the same cases, with forensic pathologists typically performing the soft tissue examinations (when applicable), and forensic anthropologists providing analyses of the skeletal tissue. This approach works particularly well in medical examiner and coroner offices with the resources to employ a forensic anthropologist on their staff.

It has recently been argued that the pool of qualified forensic anthropologists available for consultation to medical examiners and coroners is too small to properly serve the medicolegal community [5]. In lieu of consulting with forensic anthropologists, it is suggested that the knowledge required to practice forensic anthropology can be obtained through 1 year of additional study received during the post-graduate training [5]. This viewpoint vastly underestimates the complexity and breadth of forensic anthropology and its full application to medicolegal investigation. Although potentially useful in increasing pathologists' overall knowledge of the value of forensic anthropology, such programs cannot begin to cover the information necessary to properly perform forensic anthropological examinations beyond the most basic skeletal assessments. A directed, mentored, long-term, specialized education is required, and would be far too burdensome in addition to the already extensive training and education required for forensic pathologists. Moreover, even if the appropriate level of expertise in anthropology were achieved, the equipment, supplies, and instrumentation required to perform most thorough forensic anthropological analyses can be rather extensive, and would likely impose a significantly greater financial burden on forensic pathologists than the cost of periodically contracting the services of a qualified anthropology consultant.

Although a number of short courses and certificate programs are offered in forensic anthropology and provide important opportunities for continued professional development, none are meant to provide sufficient training or education in forensic anthropology to qualify participants to conduct forensic anthropological examinations. While budget constraints often force a problematic "do more with less" philosophy, there already currently exists (in the United States, at least) a shortage of forensic pathologists [6]. Cross-training forensic pathologists in forensic anthropology could further contribute to this shortage through additional training requirements (and more time and money) which would slow the education/training process.

The American Board of Forensic Anthropology (ABFA) is currently the only accredited organization for the certification of qualified forensic anthropologists. Certification by the ABFA requires that the applicant hold a Ph.D. in

anthropology (or closely related field, such as human biology with a focus on skeletal biology), demonstrate experience and contributions to the field of forensic anthropology, pass a rigorous written and practical examination, recertify every 3 years, and demonstrate continued practice, professional development, and contributions to the field. The ABFA maintains a list of currently certified and practicing forensic anthropologists on its website [7], making it easy for anyone to locate and contact an ABFA-certified forensic anthropologist for consultation. As of the time of this writing, the list includes 77 active board-certified Diplomates. In addition, there are a number of highly experienced non-board-certified forensic anthropologists, with at least a master's degree in anthropology, providing forensic anthropological consultation services to their local law enforcement and medicolegal communities. As with forensic pathology, however, board certification in forensic anthropology demonstrates the achievement of a high level of experience and skill which can be especially important if a case goes to trial, and the use of board certified experts is strongly encouraged (if not required in some cases). Forensic pathologists, even those certified in Forensic Pathology by the American Board of Pathology, would not be qualified to achieve board certification by the ABFA unless they held a Ph.D. in anthropology or a closely related field. This educational requirement cannot be achieved in 1 year of additional training following a forensic pathology fellowship.

Throughout much of Europe, forensic anthropology is currently performed mostly by individuals trained in other professions such as pathology, anatomy, archaeology, and biology, with training and experience typically being more important than academic history in defining who is qualified to practice [8]. The Forensic Anthropology Society of Europe (FASE), however, recently developed a system of certification in forensic anthropology requiring applicants to hold a Ph.D. or Master's Degree and demonstrate training and experience in forensic anthropology prior to taking a written and practical examination [9]. This system, like the ABFA, will help to standardize the education, training, and experience of forensic anthropologist practicing in Europe, facilitating the recognition and availability of qualified consultants.

It has further been argued [5] that forensic anthropological consultation is cost-prohibitive since forensic anthropologists typically charge a fee for their services. Expert analyses certainly can come at a cost, and specialists (including not only forensic anthropologists, but also toxicologists, histologists, and other specialists in the medicolegal community), should be compensated for their time and expertise. The cost of forensic anthropological consultation services, however, can actually be relatively low and here we offer several suggestions for utilizing

forensic anthropological consultation in a cost effective manner. These are not intended to suggest or encourage that anthropologists (or any other specialist) work for free, or to discourage the hiring of anthropologists within medicolegal offices where this is an option. We recognize and recommend that the best practice is the employment of a staff forensic anthropologist or the retention of a regular consultant. The following are suggested alternatives for those medicolegal offices that do not have sufficient resources or casework to support these preferred arrangements.

One option, especially for medical examiner and coroner offices that have frequent forensic anthropology consultation needs but may not have the caseload to support full-time forensic anthropological casework, is to exploit the various other skills of many holistically-trained anthropologists. Forensic anthropologists employed by medical examiner offices can serve the office in ways far beyond traditional anthropology casework. Many anthropologists working in medical examiner offices serve several roles such as medicolegal death investigator, mass fatality incident planner, identification director, tissue procurement coordinator, or accreditation manager. By meeting several needs of the office, employment of an anthropologist can ensure thorough utilization of the specialized skill set in death investigation while reducing the overall cost.

Forensic anthropologists serving in other public service roles represent another consultation resource potentially available to medicolegal offices. These individuals might include state archaeologists (such as in the state of Iowa) or museum curators who may be permitted to engage in case-work consultation as part of their regular duties. Similarly, some organizations have a mission to serve the broader law enforcement and medicolegal community. The Federal Bureau of Investigation (FBI) Laboratory, for example, provides forensic examinations including forensic anthropology to local, state, federal, and international law enforcement and medical examiners offices. This is also the case for the Central Identification Laboratory of the Defense POW/MIA Accounting Agency (DPAA, Formerly JPAC). Because these laboratories are federally funded (and services are effectively pre-paid by US taxpayers), there is no fee charged for their forensic anthropological examinations. Additionally, many anthropologists employed at universities offer services at a reduced cost, viewing the consultation as a community service or an opportunity to provide training to graduate students.

Some cases, such as with determination of human versus non-human remains, may be addressed in a preliminary (or sometimes even conclusive) manner with a "telemedicine" approach. Obtaining high quality photographs of questioned material with rapid transmission to the consulting

anthropologist may direct the investigation and allow for release of a scene if the material is determined to be definitively non-human in origin and not pertinent to the investigation. Because of the rapid and essentially no-cost nature of these examinations, many forensic anthropologists offer such photographic analyses free of charge. If photographic results are inconclusive or if additional information is desired, the materials can then be delivered to the consultant for direct examination. Complex cases with the potential for prosecution (such as a homicide) may require that the consulting anthropologist directly examines the evidence or be physically present at the scene, but this rapid, preliminary, low-cost option may provide important investigative direction initially.

In conclusion, despite the apparent misconception that forensic anthropological consultation is difficult to obtain due to availability or cost, there exists a more than sufficient pool of qualified forensic anthropologists to meet the needs of the medicolegal community, and a variety of mechanisms for acquiring forensic anthropological services. Moreover, given the extensive education and training required to achieve qualification in this increasingly sophisticated field, consultations are best provided by qualified forensic anthropologists. By achieving and maintaining their individual expertise and working together, forensic specialists in pathology and anthropology (as

well as other disciplines) can achieve the most scientifically reliable results in medicolegal investigations.

Acknowledgments We would like to thank João Pinheiro, Eugenia Cunha, Christopher Rainwater, Reza Gerretsen, and numerous other colleagues who provided valuable feedback on this manuscript.

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