



# THE EVOLVING APPLICATION OF HUMAN ANATOMY PEDAGOGY AND RESEARCH

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## INTRODUCTION

The ethical underpinning of human anatomy pedagogy and research has played a pivotal role in shaping the discipline's development and growth. Throughout history, the study of human anatomy has undergone profound transformations in both teaching methodologies and research practices with ethics being at the core (Comer, 2022; Iwanaga et al., 2022). As technology continues to advance, so do the ethical challenges in handling anatomical specimens and human cadavers (Comer, 2022; Roberto & Juan, 2012). Since bioethics serves as the

moral compass that guides educators, researchers and students in their journey through the intricacies of human anatomy, it is paramount to understand its growth and evolution over time and the dilemmas being faced (Jones, 2017). This editorial thus wishes to apprise health sciences professionals and students to the evolving role of ethics in human anatomy pedagogy and research and the ethical responsibilities of anatomists in their interactions with human bodies.

## HUMAN BODIES VS ONLINE VIDEOS, MODELS, ATLASES

Human anatomy pedagogy has evolved significantly from the use of only traditional dissection of the human body to the integration of innovative technologies such as digital atlases, dissection videos, virtual dissection tools, 3D models and e-learning modules which have supplemented the anatomical teaching landscape (Winkelmann, 2016). The emergence of these tools has enhanced the learning experience and accessibility of anatomical studies (Roberto & Juan, 2012; Winkelmann, 2016). However, this shift towards technology presents ethical considerations

such as obtaining informed consent for using anatomical images in digital learning environments. Similarly, the landscape of human anatomy research has also experienced noteworthy transformation with researchers now having access to sophisticated imaging techniques. These tools have accelerated dissemination of information in online journals. Nevertheless, researchers face ethical dilemmas concerning the use of human data, the use of human body images in publications and informed consent for these images (Jones, 2017).

## DONOR CONSENT

Securing informed consent from individuals for the use of their bodies for teaching and research remains a critical concern among anatomists (Winkelmann, 2016). Informed consent for body donation is highly

recommended by the International Federation of Associations of Anatomists (IFAA) for good practice in body donation. This has seen the birth of body donation programs that play a vital role in anatomy

education and research in terms of collaborating with educational institutions to establish comprehensive protocols for handling donated bodies with dignity and sensitivity. The sourcing of bodies requires ethical scrutiny to ensure the provenance and legality of anatomical specimens (Cornwall et al., 2016; Ghosh, 2020).

However, the sourcing of bodies for teaching purposes faces many challenges, including religious constraints, mistrust and unwillingness to donate from the general population. This is an ongoing challenge that is yet to be fully addressed (Keet & Kramer, 2022).

### **IMAGING OF HUMAN BODIES**

The advent of imaging (digital photographs, videography, CT scans and MRI's) of body donors over the years has come with an associated concern for whether specific informed consent, ideally obtained directly from the donor, during life, or from their family or next of kin has been obtained (Cornwall et al., 2016; Keet & Kramer, 2022). The IFAA have recently published recommendations for human tissue acquisition and use which will act as a strong guide for anatomists in their use of digital images (IFAA, 2012). These recommendations span from consent to dissipation and use of imaging. They state that consent should explicitly cover the purpose of imaging, including its educational use. Photography and videography should be staged respectfully, with a focus on specific educational objectives, while avoiding any potential identifying characteristics of the donor, such as face or tattoos. All digital materials, including photographs and videos of donors, should be stored securely with

restricted access. Employing passwords and firewalls can safeguard these materials from unauthorized use or distribution. To respect donors' privacy a policy for the deletion of digital material that is no longer being used for educational purposes, should be considered to erase the image and the digital "footprint" (Cornwall et al., 2016). Posting pictures of donors being dissected on websites, social media, or promotional materials without a specific educational intent should be discouraged. Educational institutions should strictly adhere to ethical guidelines, ensuring that any visual materials are intended to promote knowledge, understanding, and appreciation for the human body and its complexities. Anatomists should be aware of the provenance of the images of bodies acquired from external sources (eg internet sources) which they used, to ensure ethical use of digital images in teaching and research (Lottering et al., 2022).

### **QUALITY OF AND REPORTING OF RESEARCH**

The use of cadaveric material and anatomical images in anatomical science research remains essential for advancing knowledge to improve health care. Although many regulations for ethical use of such material exist, their application is not universal. Disparities exist in reporting anatomical findings, with regard to ethics, clarity, accuracy, comprehensiveness and quality of the data and information. There is definite need for anatomists to improve in these

aspects, in order to realize high standards, by implementing the following recommendations. First, the Anatomical Quality Assurance (AQUA) checklist/guidelines (Tomaszewski et al., 2017), and secondly the standardized statement for the use of human cadaveric tissues in anatomy research papers (Iwanaga et al., 2022). The goal of these recommendations is to ensure quality of anatomical papers, and to standardize the writing approach by which

the ethical use of cadaveric donors is acknowledged in anatomical studies.

### **DATA PROTECTION AND PRIVACY IN ANATOMICAL RESEARCH**

Most countries have recently enacted various data protection and privacy frameworks which regulate the collection, use, storage and dissemination of individual personal data. The frameworks are based on principles of purpose limitation, data minimization, storage limitation, integrity and confidentiality, accuracy, and accountability. The details of the application and implications of these frameworks on

health research have been analyzed by various authors (Chico, 2018; Mee et al., 2021; Staunton et al., 2020) and continue to be subject of continual discussion and review. In the meantime, it is important that during the use of cadavers, human parts and tissues, images, videos, models and atlases in research, due care is taken to protect the privacy of the individual data subject.

### **CONCLUSION**

In conclusion, the evolution of ethics in Human Anatomy pedagogy and research has been intertwined with the discipline's progress. As technologies continue to advance, the ethical implications in handling human bodies and anatomical specimens become more complex. Upholding ethical values is imperative to preserve the integrity and credibility of anatomy education and research. Body donation programs must prioritize explicit informed consent, and

digital images of human bodies should be approached with the utmost sensitivity and discretion. Safeguarding digital material and the responsible use of visual materials further reinforce the ethical foundation of anatomy education and research. By adhering to these ethical principles, the academic community can honor the generosity of body donors, continue to foster an ethical culture and advancing the field of human anatomy with integrity.

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