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The Development of Recommendations for Legacy Anatomical Collections: A Tale of Two Approaches

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Abstract Legacy anatomical collections are literally "skeletons in the closet" in many anatomy, anthropology, and other institutions where human tissues may be found. There are not only bones in these collections but fetuses, histological slides, and other human tissues that were obtained decades ago in a very different ethical landscape. The provenance of these tissues is often unknown, with documentation missing and no other means of identifying their origin or history. After recent scandals regarding the abuse of tissues of the deceased increased public attention, several American professional organizations developed new recommendations for the use, storage, and disposition of these human tissues. This manuscript discusses the formation, operations, and conclusions of guidelines from two associations: The American Association for Anatomy Recommendations for the Management of Legacy Anatomical Collections (Cornwall et al. 2024a) and the American Anthropological Association Commission for the Ethical Treatment of Human Remains Final Report (Agarwal et al. 2024). These recommendations inform the memberships of their respective organizations on the proper treatment of human remains and they also lay the foundation and framework for the proper ethical oversight of legacy human tissues in many other domains.

Keywords Deceased humans · Human tissues · Ethics · Anatomy · Anthropology · Guidelines · Legacy Collections

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Introduction

The definition of legacy anatomical collections can be summarized in the term "skeletons in the closet" (Alex 2023; Barron et al., 2025; Coman et al., 2022; Cornwall et al. 2022). These are human tissues (bones, organs, fetuses, histological materials) that were collected from deceased individuals prior to the development of informed consent in a very different ethical environment. They were often taken without permission from marginalized populations in society (Robbins Schug et al. 2025; Cornwall et al. 2025). Often these individuals' remains have little to no documentation and it can be very difficult to determine their history and provenance.

These collections are found throughout academia (anatomy departments, anthropology departments, biology departments, medical schools), in museums as well as in private collections. In the United States, these collections exist in a legal grey area (Champney et al. 2019). They can be bought and sold like

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property with very little regulatory oversight unless they are Native Americans due to the U.S. Native American Graves Protection and Repatriation Act (NAGPRA) (Bader et al. 2023).

Anatomical collections can include a variety of tissues and their derivatives, ranging from human bones to embryos, fetuses, brains, other organs, hair, tissues in histology slides, and the digital representations of these tissues (3D printing, photography, and other forms of imaging (MRI, CT, radiography)), which may give rise to differing levels of ethical consideration (Cornwall et al. 2024a, 2024b). For example, if the presence of DNA were required, digital representations along with grave goods often found with these collections might not fall under ethical guidelines. However, depending on the societal context, images and grave goods can have the same ethical weight as the tissues themselves and require protection from abuse.

The oversight, use, and storage of such collections has received recent heightened attention due to several well-documented public controversies and scandals. There are numerous examples of these, but three from Philadelphia provide a good example of the type of collections and the ethical concerns surrounding them. First, there are hundreds of human skulls at the University of Pennsylvania collected by Samuel Morton (Renschler and Monge 2008; Geller 2024) that were stolen from graves or taken by other unethical means. Second, there is a public medical museum in Philadelphia (Mütter Museum) that has many human remains on display (pathological materials collected by physicians many years ago) (Lau and Scolforo 2025). Recently, the museum has altered their policies on the display of these human remains (Lau and Scolforo 2025). Third, human remains from the killing of children by a police bombing in 1985 had been retained at the University of Pennsylvania and were presented in an online anthropology course as unidentified but were instead the identified bones of these children that had never been returned to their family (Pandiaraju 2024; Pilkington 2021). These examples indicate that human tissue collections can span a large time frame (there can be recent collections as well as those over one hundred years old) and they can span a wide range of tissue types and groups that utilize and/or display them.

These and other more recent human tissue scandals were accompanied by public outcry and active discussions, so that American academic associations realized the need for the development of guidelines and recommendations for the ethical treatment of human remains in legacy collections. Both the American Association for Anatomy and the American Anthropological Association established task forces to examine and develop specific recommendations.

American Association for Anatomy Recommendations for Legacy Collections

The American Association for Anatomy sponsored three webinars on legacy anatomical collections in the summer of 2021 (American Association for Anatomy 2021). Common themes that were discussed in these webinars were 1) exploitation—often from positions of privilege and power, via dominant colonial (and often) western perspectives; 2) questions around the humanity, community, identity, and personification of those individuals in the collections; 3) current social awareness and public sentiment with a demand for change; and 4) common issues for numerous fields—museologists, anatomists, bioanthropologists. Overall, the webinars provided examples of good practice and called for an increased awareness and response to these issues. One of the outcomes of these webinars was the development of a task force of the American Association for Anatomy to develop guidelines for the ethical treatment of these legacy collections.

The members of this international and interdisciplinary taskforce met in numerous online meetings. During deliberations, a set of guiding principles were developed. Operational domains that are covered by these principles, as well as contextual themes that are used to implement these principles were also formulated (Figure 1). The guiding principles were to 1) obey the laws of the local jurisdiction on the use of human tissues; 2) follow the bioethical principles for human research (Beauchamp and Childress 2019); 3) be respectful of the cultural context of the community and the society; and 4) maintain transparency around the entire management of the collection. These principles were applied to three operational domains: 1) the inventory and provenance of the human tissues in the collection; 2) the use and storage of the human tissues in the collection; and 3) the final disposition of the human tissues in the collection. The mechanisms that can help guide the principles in these domains are the contextual themes and these include 1) institutional and stakeholder/custodian oversight; 2) determination of provenance of the tissues; and 3) the full involvement of the "communities of care" for

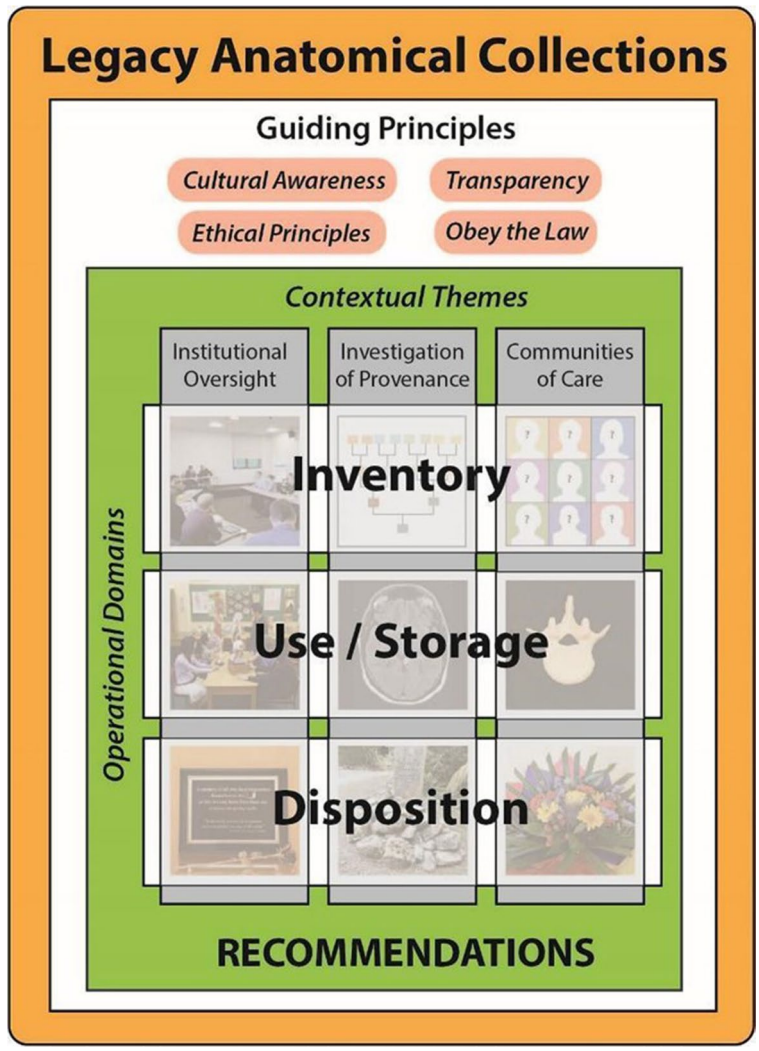

Fig. 1 Graphic abstract illustrating a representation of the guiding principles, operational domains and the contextual themes in the American Association for Anatomy's recommendations for legacy anatomical collections (from Cornwall et al. 2024a).

these human tissues, that is: those who best represent the values of the individuals found in the collections.

The recommendations were approved by both the Board of Directors of the American Association for Anatomy and the membership and they were published for the academic community to utilize in their handling of anatomical collections (Cornwall et al. 2024a). As recommendations, they do not have any enforcement mechanisms within the association or the academic community. They support the ethical treatment of all human remains and they emphasize the value and importance of involving those who have the closest representation (familial or cultural) to those individuals in the collections ("communities of care") in decisions about the collections. They also clearly state that the institutions and stakeholders who oversee these collections are custodians of the collections and are not owners of the collections.

American Anthropological Association Report on the Ethical Treatment of Human Remains

At approximately the same time as the American Association for Anatomy was developing recommendations for the treatment of legacy anatomical collections

(Cornwall et al. 2024a), the American Anthropological Association convened a commission to investigate and report on the ethical treatment of human remains, which met virtually as well as in person (Agarwal et al. 2024). This commission was established because of the numerous scandals involving human tissues with a major catalyst being the anthropological use of the children's bones from the MOVE bombing (Pandiaraju 2024; Pilkington 2021).

The group determined that meeting with representatives of the many indigenous peoples whose tissues were collected by anthropologists would be an important way to gain their valuable and specific insight. Several in person or hybrid sessions were organized to meet with these global representatives including in South Africa, Canada, Japan, Australia, Senegal, and the United States. There were also sessions to meet with museum directors, geneticists, and with the American Anthropological Association membership to gain insight from the stakeholders who oversee these human tissue collections. The commission members wrote and released a report to the American Anthropological Association with specific recommendations for the ethical treatment of human tissues (Agarwal et al. 2024). These recommendations emphasized the role of stewardship over these tissues instead of ownership of the tissues. They also emphasized the important role of a "community of care" to oversee and advise on the proper treatment of their ancestors. Notably, these guidelines came with suggestions for the enforcement of these policies by the association, with penalties that could include sanction or expulsion from the association for not following the recommendations.

Similarities and Differences of the Two Approaches

While these two approaches independently investigated the ethical treatment of human tissues—especially concerning older, poorly provenanced tissues—they came to similar conclusions but with slightly different emphases. Similarities included the treatment of the tissues as "subjects" and not "objects" with those overseeing the tissues as custodians and not owners. Both groups emphasized that the tissues deserve respect and dignity in the same way that the recently deceased are treated by their loved ones. This is the "grandmother" test: these human tissues should be treated in the same manner as persons would treat their deceased grandmother. No one owns their grandmother's remains and those that take care of her remains do so with respect and dignity.

Another similarity between the two approaches is the designation of "communities of care"; those individuals or groups that can provide insight into the proper familial or cultural care of specific human remains. These communities would represent the best interests of those human remains in the cultural, societal, and religious context that is most appropriate. Both approaches emphasized that the custodian or other stakeholders are responsible for treating the human remains in their possession with the cultural sensitivity that befits those in their care.

Differences were notable on scale and orientation. The American Association for Anatomy recommendations specifically narrowed their frame of reference to human remains in the United States of America, since they were developed by an American association and the recommendations might not necessarily be applicable globally. The American Anthropological Association commission, on the other hand, brought an international perspective to their report since many of their members have obtained human tissues internationally. They purposefully gathered information from global indigenous groups on how they would like their ancestors' remains treated. The American Anthropological Association report discusses the global nature of the investigation, and its conclusions should be applicable to all human tissues, irrespective of global origin. Another difference between the two approaches was an emphasis on the use of the tissues. In the American Association for Anatomy recommendations, all uses were considered with educational use highlighted. In contrast, the American Anthropological Association report concentrated almost exclusively on the research use of the tissues with educational use mentioned but not discussed in detail. This difference is primarily due to the orientation of the two associations.

One key difference between the two approaches is enforcement mechanisms. The American Association for Anatomy recommendations do not provide any enforcement suggestions and refer to their recommendations as suggestions to be followed voluntarily. The American Anthropological Association report, however, suggests several enforcement options. The report notes that members of the

American Anthropological Association can be sanctioned, can have prestigious awards rescinded or can be expelled from the association if they do not follow specific ethical guidelines. The report also suggests that all those who publish in the association's journals should be required to follow the report's guidelines.

Where Do We Go from Here?

With the release of these two reports, it will be of interest to determine if any meaningful changes in the ethical handling of human tissues occurs by members of these associations. Certainly, the reports have highlighted ethical lapses that have previously occurred, and any future lapses cannot be blamed on ignorance regarding the existence of these recommendations.

Whether the recommendations from these reports are ever enforced will also be of interest. Will those who oversee legacy anatomical collections and other collections of human tissue change their behaviours especially when there are no legal requirements to do so? When decisions about the storage, use, or disposition of human tissue collections are necessary, who will make those decisions? Will the custodian and their institutions make unilateral decisions or will communities of care be actively involved in these decisions? Both reports emphasize that communities of care must be involved in all decisions regarding human tissues, but putting this into practice will require time, resources, and effort by all involved.

Does the specific type of human remains (cells, tissues, organs, or whole bodies) or the type of institution (university, museum, private owner, for profit travelling entertainment show) have an impact on the adherence to these recommendations? Should for-profit companies be held to a higher standard than academic institutions or do all human tissues require the same level of respect and dignity irrespective of their tissue type or the stewardship institution? Both recommendations suggest that all human tissues be treated with respect and they provide guidance for all types of institutions to follow these foundational guidelines.

Does the age or provenance of the human remains matter when making these decisions? Are human fossils afforded the same level of respect and dignity as the recently deceased (Champney et al. 2025)? Should human bones that came from the human bone trade in the Indian subcontinent (Agarwal 2025) be treated any differently than newly derived bones from fully consented donors? These and other questions about the ethical treatment of human tissues are not explicitly answered in the associations' reports, but the reports do provide a foundation and a framework for addressing these questions.

Discussion and Questions

There are thousands, perhaps hundreds of thousands, of human remains in legacy anatomical collections around the world. Many of the individuals in these collections are unknown with little to no information on their origin or their community. Many of them were collected without consent from individuals in marginalized communities (Robbins Schug et al. 2024). With recent scandals involving these individual's tissues and with an increased awareness of the ethics of human tissue use, American academic associations have developed guidelines and recommendations for the proper and respectful treatment of these individuals. These guidelines differ based on the association's membership and goals, but they do have the same fundamental principles (Agarwal et al. 2024; Cornwall et al. 2024a). These principles include 1) respect and dignity for all of the tissues in their possession; 2) consultation with cultural or familial groups ("communities of care") that can provide insight into the proper handling of these tissues; 3) transparency in all aspects of these collections including inventory, use, storage, disposition and financial; and 4) following as closely as possible the basic bioethical principles for human research (Beauchamp and Childress 2019).

Questions have arisen from discussions with those who oversee these collections and which are not specifically addressed by the guidelines. These questions came from individuals who watched the initial anatomy webinars in 2021, from those that participated in the numerous anthropology listening sessions, from indigenous commentators, and from those who manage collections of human tissues. These are listed below with points that can be addressed in the future. The responses are the author's personal views on the current state of ethical treatment of human remains.

1) Should there be an IRB-like ethical oversight committee at institutions that determines how to treat human remains and legacy collections?

The answer is "yes," and this committee should contain a variety of members: those who have affiliations with the institution and may be involved in the oversight of the collections as well as members who can provide insight into how those individuals in the collections would have liked to be treated (communities of care). The committee should also include members of the public from the local community, as well as others with an interest in bioethics, in legal regulations of human tissue use, in the philosophy of life and death or other germane topics.

2) Is it ethical to store human tissue collections even if there is no current need or use?

Some individuals think that human tissue should only be used and stored if there is a dedicated and ongoing reason for their use and storage. Other individuals think that the prospect of future use is enough justification for the continued storage of these human tissues. This requires a balanced approach that could be helped by insight from an ethical oversight committee and a community of care. An important point not to overlook is that any storage of human tissues must be respectful with an awareness of those individuals in the collection as being as uniquely human as your loved ones.

3) Should unprovenanced "colonial" remains be held waiting to be repatriated—or should they be respectfully disposed (cremated)?

An institution (and its associated ethical oversight committee) should determine what is the most ethical and responsible way to treat their human tissue collections. If the tissues cannot be kept in a respectful manner due to space and cost considerations, it might be more ethical and responsible to seek a transfer of the tissues to another institution that can treat them appropriately. If a transfer cannot take place, then, with insight and approval from a community of care, the tissues could be respectfully disposed of in a culturally appropriate manner. All of these decisions and actions should be handled with transparency and detailed documentation so that all involved are fully aware of the process. The disposition of unprovenanced human remains should not occur as a way to bury the history of these individuals or to remove the institutional responsibility for the ethical treatment of these remains. It is recommended that institutions acknowledge their possession (and disposition) of these remains with educational displays and other public-facing presentations.

4) Should samples of bone from unprovenanced skeletons be used to help ascertain their origin?

In other words, how do you balance desecrating human remains in order to potentially find their proper home against the desire of some communities that no sampling of human remains should occur?

This answer also requires a balanced approach between the needs of the institution as compared with honouring the wishes of those individuals in the collections (as best determined by a community of care if no familial input is possible). Generally, the wishes of those in the collection should be placed above the needs of the institution. So, in this case, if it is known that the individuals in the collection, or those representing the individuals in the collection, do not support sampling to determine their provenance, then sampling should not occur.

5) Is it ethical to photograph, CT scan, MRI scan, and/or 3D reconstruct anatomical collections?

For example, prior to repatriating Native American skulls, would it be ethical to photograph, scan, or 3D reconstruct these skulls? Digital versions of these skulls (and a plastic replica) would then exist (perhaps "emortally"). Do these digital remains continue to inflict injury on those individuals or their community even though no actual human remains are involved?

This is a highly debated point amongst those in this area of study. There are many that contend that any digital copy of human tissue would have some (or the same) level of ethical consideration as the original. There are others that contend that only the actual, original human tissue has ethical considerations and that any digital duplicates have no more ethical weight than a photograph or drawing of a living human. This response can depend on the cultural beliefs of the individuals in the collection (as determined by familial input or by communities of care) with some indigenous cultures believing that photographs can impact the spirit of the individual.

6) Are there extra considerations that should be contemplated regarding online availability of anatomical collections compared with in person museum display?

This question raises the issue of how human tissues are displayed and whether the type of display affects the ethical considerations of the tissue. Most individuals in this area of study suggest that the tissue itself has ethical weight and that the means of display doesn't change that weight. There are more respectful or less respectful ways to display human tissues, but this isn't because the tissues deserve more or less respect. All human tissues deserve to be respected. Moreover, as a means of respect, all displays of human remains must be protected from exploitation and morbid curiosity. There should be an educational purpose for all displays, the displays should be revenue neutral and should be presented in a dignified manner with a description of the ethical concerns surrounding their display.

7) After respectfully cremating and burying an embryo/fetal collection, should the institution publicly acknowledge the collection with a commemoration or plaque?

There are institutions that decide the easiest way to deal with an unwanted collection is to cremate the collection and bury it—usually with no notice and no acknowledgement. They want to literally bury their responsibility for the collection. Many commentators think this is inappropriate and that institutions should be transparent about their handling of these collections. They should consult with any groups that may have a cultural connection with the individuals in the collection (community of care), and they should transparently recognize and acknowledge the history of the collection—as a teaching moment for all those involved.

8) Are there ethical concerns around identification and repatriation of a stillbirth or abortion? Would this retraumatize the individual or the community?

This question raises a challenging point about the respectful treatment of the individuals in the collection versus the emotional responses of those who may have a familial or cultural connection. By revitalizing this issue in a family or community, would it cause more harm and retraumatize them? This is a difficult determination that needs to be weighed carefully by an ethical oversight committee with decisive insight from the community of care representing those individuals in the collection.

Conclusions

Legacy anatomical collections and other collections of human remains are composed of individuals who deserve the same level of respect and dignity that we would provide for our deceased loved ones. They should be "humanized" and not commodified as "objects" (Cornwall et al. 2026; Hildebrandt et al. 2025). While the current laws may not recognize their humanity, the ethics and morals of the community should set appropriate standards for their treatment. This was the goal of both sets of recommendations: to provide foundational guidance for the proper, respectful treatment of the individuals found in human tissue collections.

Acknowledgments All the individuals who have their tissues in these collections must be acknowledged even if they did not consent to their tissues being preserved and studied. We must honour their injury by treating them with the utmost respect and dignity. The editorial suggestions of Dr. Sabine Hildebrandt and Dr. Jon Cornwall are greatly appreciated.

Declarations

Conflict of Interests The author was a member of the American Association for Anatomy's Taskforce on Legacy Anatomical Collections; the American Association for Anatomy's Body Donor Program Committee and the American Anthropological Association's Ethical Treatment of Human Remains Commission. He is a member of the Federative International Committee for Ethics and Medical Humanities (FICEM), the ethics committee of the International Federation of Associations of Anatomists. He oversees the South Florida Body Donation Program, is entrusted with the care of human remains in this program and serves on the University of Miami's Anatomical Advisory Committee. He receives royalties from Blackwell Wiley Publishers for "Essential Clinical Neuroanatomy".

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References

Agarwal, S.C., M. Blakey, T.H. Champney, et al. 2024. The Commission for the ethical treatment of human remains, American Anthropological Association, FINAL REPORT. https://americananthro.org/about/committees-and-task-forces/tcethr/ Accessed November 20, 2025.

Agarwal, S.C. 2025. The disposability and inclusion of Brown bodies. *American Journal of Biological Anthropology* 186(1): e25003.

Alex, B. 2023. Who are the keepers of academic skeletons? https://www.discovermagazine.com/who-are-the-keepers-of-academic-skeletons-45299. Accessed November 20, 2025.

American Association for Anatomy. 2021. Webinar: Anatomical legacy collections: Ethical concerns about disposition of collections with unknown origins. https://www.pathlms.com/american-association-for-anatomy/courses/72214. Accessed November 20, 2025.

Bader, A.C., A.E. Carbaugh, J.L. Davis, K.L. Krupa, and R.S. Malhi. 2023. Biological samples taken from Native American Ancestors are human remains under NAGPRA. *American Journal of Biological Anthropology* 181(4): 527–534.

Barron, J., B. Bayles, and M.D. Hamilton. 2025. Educational, but ethical? The tension within historic skeletal collections. *Practicing Anthropology* 48(1): 1–11.

Beauchamp, T.L., and J.F. Childress. 2019. *Principles of biomedical ethics*. 8th ed. Oxford: Oxford University Press.

Champney, T.H., S. Hildebrandt, D.G. Jones, and A. Winkelmann. 2019. BODIES R US: Ethical views on the commercialization of the dead in medical education and research. *Anatomical Sciences Education* 12(3): 317–325.

Champney, T.H., H.F. Smith, S. Hildebrandt, and J. Cornwall. 2025. Human, animal or mineral? Ethical considerations for studies of fossilized Hominin remains. *American Journal of Biological Anthropology* 187(3): e70085.

Coman, J, S.S. Craig, and A.M. Kelly. 2022. Skeletons in the closet: Time to give human bones acquired by health practitioners for educational purposes the respect they deserve. *Medical Journal of Australia* 216(8): 392–396.

Cornwall, J., S. Hildebrandt, and T. Champney. 2022. Skeletons in the closet: Time to give human bones acquired by health practitioners for educational purposes the respect they deserve. *Medical Journal of Australia* 217(7): 379.

Cornwall J, Champney TH, de la Cova C et al (2024a) American Association for Anatomy recommendations for the management of legacy anatomical collections. Anatomical Record 307(8):2787–2815

Cornwall J, Hildebrandt S, Champney TH, Billings B, Schmitt B, Winkelmann A (2024b) IFAA recommendations for the ethical use of anatomical images. Anatomical Sciences Education 17(1):7–10

Cornwall, J., S. Hildebrandt, T.H. Champney, and V.B. DeLeon. 2025. Interdisciplinary interaction and engagement around the use of human remains: Comment on "They are people too: The Ethics of curation and use of human skeletal remains for teaching and research". *American Journal of Biological Anthropology* 187(3): e70089.

Cornwall, J., S. Hildebrandt, and T. Champney. 2026. From concept to community of practice in anatomical ethics and professionalism: 5 years of the "Bioethics Unicorns" education initiative. *Anatomical Sciences Education* 19(5): 764–775.

Geller, P. 2024. *Becoming object: The sociopolitics of the Samuel George Morton Cranial Collection*. Gainesville: University of Florida Press.

Hildebrandt, S., J. Cornwall, and T.H. Champney. 2025. More than body parts: A new ethos of anatomy education. *Academic Medicine* 100(3): 273–280.

Lau, M., and M. Scolforo. 2025. Medical museum in Philadelphia overhauls policies on human remains to meet modern ethical standards. https://apnews.com/article/mutter-museum-philadelphia-human-remains-medical-ethics-a6cb79fe008017519a6ff7b87aa9f351 Accessed November 20, 2025.

Pandiaraju, V. 2024. More human remains from Philadelphia's 1985 MOVE bombing found at Penn Museum. https://www.thedp.com/article/2024/11/penn-museum-move-remains-delisha-africa-2024. Accessed November 20, 2025.

Pilkington, E. 2021. Bones of Black children killed in police bombing used in Ivy League anthropology course. https://www.theguardian.com/us-news/2021/apr/22/move-bombing-black-children-bones-philadelphia-princeton-pennsylvania Accessed November 20, 2025.

Renschler, E.S., and J. Monge. 2008. The Samuel George Morton cranial collection historical significance and new research. https://www.penn.museum/sites/expedition/the-samuel-george-morton-cranial-collection/. Accessed November 20, 2025.

Robbins Schug, G., S.E. Halcrow, and C. de la Cova. 2025. They are people too: The ethics of curation and use of human skeletal remains for teaching and research. *American Journal of Biological Anthropology* 186(2): e70013.

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