



Rethinking Cadaveric Dissection in an Era of Virtual Reality and Body Donor Shortages

Ananya Bouchard^{1*}, Tomasz Fernandez², Ganesh Berg³

¹Department of Medical Sciences, Tamiraparani Research Institute of Medical Sciences, Slovakia

²Department of Medical Sciences, Nordkapp School of Medical Sciences, Greece

³Department of Medical Sciences, Loire School of Medical Sciences, Switzerland

Article Info

Volume 1, Issue 1, 2026

[doi: 10.62715/ijcap.2026.v1.i1.pp26-30](https://doi.org/10.62715/ijcap.2026.v1.i1.pp26-30)

Received: 13 April 2026

Accepted: 01 June 2026

Published: 23 July 2026

Abstract

Anatomy departments face two pressures at once. Immersive virtual reality has become cheap and good enough to be offered as a substitute for the dissecting room, and in many places the supply of donated bodies does not meet the demand of growing student numbers. The debate that has followed is usually framed as a contest between dissection and technology. This Perspective argues that the framing is unhelpful. The comparative evidence does not show that any one laboratory method produces better examination results than the others, so the choice cannot be settled by appeal to test scores. It should be settled by asking which learning goals require a real human body and which do not. On that view dissection is neither a rite to be defended whole nor a relic to be retired. It is a scarce resource to be assigned to the purposes for which nothing else will serve: handling tissue, meeting variation, and learning how to behave towards the dead and those who gave their bodies. Virtual reality suits spatial rehearsal, repetition and access. The article also argues that donor shortage is an ethical and organisational problem that technology cannot solve by itself, and it sets out what a curriculum built on these premises would look like.

Keywords: *Cadaveric dissection, Virtual reality, Body donation, Anatomy education, Medical curriculum, Ethics*

© 2026 Ananya Bouchard et al. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

1. Introduction

For most of the history of modern medicine, to study anatomy was to dissect. The dissecting room gave the subject its method and its place in the first year of the course, and many doctors remember it as the point at which they began to feel like members of the profession. That position has been eroding for a generation. Curricular reform has cut the hours given to gross anatomy, and surveys of medical schools have recorded a steady move from full student dissection towards prosection, models and imaging (Drake et al., 2009).

Two more recent developments have sharpened the question. Head-mounted virtual reality, once a research curiosity, is now a consumer product, and anatomy software for it is marketed directly to

* Corresponding author: Ananya Bouchard, Department of Medical Sciences, Tamiraparani Research Institute of Medical Sciences, Slovakia.
E-mail: ananya.bouchard@tamiraparani.edu

© 2026 Ananya Bouchard et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

medical schools. At the same time many schools cannot obtain enough bodies. A worldwide survey of sources found that numerous countries have no donation programme able to meet their needs and continue to rely wholly or partly on unclaimed bodies (Habicht *et al.*, 2018). When the coronavirus pandemic closed dissecting rooms and suspended the acceptance of donors, teachers everywhere were forced onto digital substitutes at short notice, and some did not go back (Iwanaga *et al.*, 2021).

It is tempting to read these events as a single story in which a new technology arrives in time to replace a failing resource. This article takes a different view.

2. A Contest That the Evidence Does Not Decide

The case for dissection has been made many times. Its defenders hold that it teaches three-dimensional structure through the hands as well as the eyes, shows students that bodies differ from books and from one another, introduces them to death, and trains teamwork and manual skill (Korf *et al.*, 2008; Ghosh, 2017). Its critics reply that it is slow, costly, dependent on embalmed tissue that looks and feels unlike the living, and unnecessary for the majority of graduates who will never operate. One medical school showed long ago that a course could be run with no cadavers at all, on living anatomy and imaging (McLachlan *et al.*, 2004).

What is striking is how little the measured outcomes help. A review of studies comparing dissection with other methods found a slight advantage for dissection but judged the evidence too weak and too heterogeneous to support firm conclusions (Winkelmann, 2007). A later meta-analysis of laboratory pedagogies found no significant difference in short-term knowledge between dissection, prosection, models and digital media (Wilson *et al.*, 2018). Trials of virtual reality tell a similar story from the other side. A meta-analysis of randomised studies reported that virtual reality improved test scores in comparison with other teaching (Zhao *et al.*, 2020), yet a controlled comparison found virtual and augmented reality no better than a tablet application and noted that headset users reported more dizziness and blurred vision (Moro *et al.*, 2017).

The reasonable conclusion is that students who are examined on factual and spatial knowledge will reach about the same score by several routes, provided they spend the time. Reviews of teaching practice have accordingly recommended a mixture of methods (Sugand *et al.*, 2010; Estai and Bunt, 2016). That advice is sound but incomplete, because it does not say how the mixture should be composed when one ingredient is in short supply.

3. The Argument: Assign Dissection by Learning Goal

The proposal of this article is that the unit of decision should be the learning goal and not the course. For each thing students are meant to learn, a department should ask whether a real human body is needed to learn it. Where it is not, a donor should not be used. Where it is, a donor should be used deliberately and well. Table 1 sets out what each of the main modalities offers when judged in this way.

Three goals seem to require the real thing. The first is the feel of tissue: the difference between fascia and nerve under the fingers, the resistance of a tendon, the fragility of a vein. No current headset reproduces this, and it is the foundation of any practical procedure. The second is variation. A virtual model is a single idealised body, usually young and lean, whereas a room of donors shows students aged, diseased and operated bodies, each with its own anomalies. The third is formation. Working respectfully with a person who chose to be there after death, and reflecting on that choice, is an education in professional conduct that software does not attempt.

Other goals are served as well or better without a donor. Learning the spatial relations of the pterygopalatine fossa or the course of the cranial nerves through the skull base is hard in the dissecting room, where the structures are small, deep and destroyed by the approach. A model that can be rotated, made transparent and taken apart repeatedly is a better tool, although work on spatial learning cautions that more viewpoints are not automatically better and that a few well-chosen views do much of the teaching (Garg *et al.*, 2001). Rehearsal before an examination, revision in the clinical years and teaching at

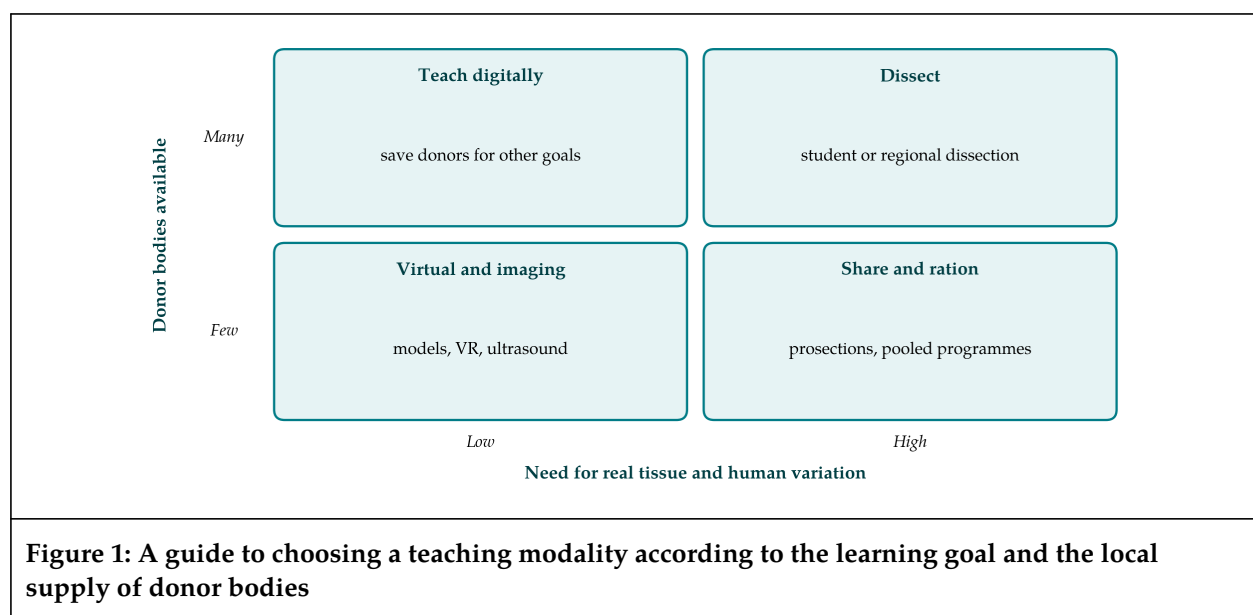
sites far from a dissecting room are further uses where virtual methods have no rival. Figure 1 combines the two considerations, the need for real tissue and the supply of donors, into a simple guide.

Table 1: The main teaching modalities in gross anatomy compared by what each distinctively offers			
Modality	Distinctive strength	Main limitation	Need for donors
Student dissection	Tactile learning, variation, encounter with death	Time, cost, embalmed tissue	High
Prosection and plastinates	Clear views of prepared regions; reusable	Little hands-on discovery	Moderate
Virtual and augmented reality	Spatial rehearsal; unlimited repetition	No touch; idealised anatomy; discomfort for some	Indirect
Screen-based three-dimensional models	Cheap and accessible anywhere	Flat display; passive use	Indirect
Imaging and living anatomy	Anatomy as met in clinical practice	Images are hard for novices to read	None

On this reasoning a school with a good supply of donors would still move much of its topographical teaching to digital and imaging methods, and would spend dissection time on fewer regions done properly. A school with few donors would not spread them thinly across the whole body for every student. It would keep them for the goals that need them, which may mean prosections prepared by staff, short dissection blocks on selected regions, or elective dissection for students heading towards surgical careers.

4. Counter-Arguments

The first objection is that the goals said to need a donor are the ones least often examined, so in practice they will be dropped. This is a fair warning. Tactile skill, familiarity with variation and professional formation are hard to test, and whatever is not tested tends to lose curriculum time (Turney, 2007). The answer is to state them as outcomes and assess them, by practical tasks and reflective work, and not to pretend that a written paper measures the value of the dissecting room.



A second objection comes from those who consider the remaining goals dispensable. Most doctors do

not operate, embalmed tissue is a poor guide to the living, and attitudes to death can be taught in hospices. Each point has force. Yet surface examination, injection, cannulation and every procedure that follows rest on a sense of what lies under the skin, and the students who will not become surgeons are the ones least likely to meet human tissue again. Softer embalming methods and fresh-frozen material have also narrowed the gap between the donor and the patient.

The third objection is that technology will soon close the gap from its side, with haptic gloves and models built from many scanned bodies. Perhaps so. The argument here does not depend on virtual reality staying as it is. It depends only on matching the method to the goal, and if a future system teaches the feel of tissue and the range of variation, the allocation should change with it.

5. Donor Shortage Is Not a Technical Problem

It would be a mistake to treat virtual reality as the cure for a lack of bodies. Shortage has causes that software leaves untouched. In some countries the law gives no clear route for a person to bequeath their body; in others there is a route but little public awareness or trust. The legal frameworks in Europe alone differ widely ([Riederer et al., 2012](#)). Where donation is weak, schools fall back on bodies that nobody claimed, which means the bodies of the poor and the isolated, taken without consent. [Jones and Whitaker \(2012\)](#) have argued that this practice is ethically indefensible, and the International Federation of Associations of Anatomists recommends that only donated bodies be used ([IFAA, 2012](#)).

A department that adopts virtual methods in order to stop using unclaimed bodies has made a good choice. A department that adopts them so as not to have to build a donation programme has avoided a duty. Digital anatomy is itself drawn from the dead. The image sets on which the first generation of three-dimensional models was built came from the Visible Human Project, whose male subject was an executed prisoner ([Spitzer et al., 1996](#)). Teachers who would ask where a cadaver came from should ask the same of a data set, and vendors should be expected to say.

6. Implications

Several practical consequences follow. Departments should write down which outcomes are to be met in the dissecting room and defend each one, so that donor use is justified goal by goal. They should invest in donation programmes, with public information, memorial ceremonies and transparent governance, as a core activity and not an administrative afterthought. Schools in the same region can share prosecutions and plastinated specimens, which last for years, and can pool donors where transport and law allow. Virtual reality should be bought for what it does well and evaluated locally, with attention to the minority of students who cannot use a headset comfortably. And researchers should stop running further trials of one method against another on a knowledge test, and start measuring the outcomes on which the methods are likely to differ.

7. Conclusion

Dissection and virtual reality are not rivals for the same job. The evidence that either yields better examination marks is weak, and the more useful question is what each can teach that the other cannot. Donated bodies are scarce and are given in trust, and they should be used where touch, variation and respect for the dead are the lesson. Virtual tools should carry the spatial and repetitive work for which they are suited. The shortage of donors remains a matter of law, ethics and public confidence, and it will be eased by better donation programmes and not by better headsets.

Conflict of interest

To be declared by the author(s) before publication.

Funding

To be declared by the author(s) before publication.

References

- Drake, R.L., McBride, J.M., Lachman, N. and Pawlina, W. (2009). [Medical education in the anatomical sciences: the winds of change continue to blow](#). *Anatomical Sciences Education*, 2(6): 253-259.
- Estai, M. and Bunt, S. (2016). [Best teaching practices in anatomy education: a critical review](#). *Annals of Anatomy*, 208: 151-157.
- Garg, A.X., Norman, G. and Sperotable, L. (2001). [How medical students learn spatial anatomy](#). *The Lancet*, 357(9253): 363-364.
- Ghosh, S.K. (2017). [Cadaveric dissection as an educational tool for anatomical sciences in the 21st century](#). *Anatomical Sciences Education*, 10(3): 286-299.
- Habicht, J.L., Kiessling, C. and Winkelmann, A. (2018). [Bodies for anatomy education in medical schools: an overview of the sources of cadavers worldwide](#). *Academic Medicine*, 93(9): 1293-1300.
- IFAA (2012). [Recommendations of good practice for the donation and study of human bodies and tissues for anatomical examination](#). International Federation of Associations of Anatomists; Plexus (newsletter), January 2012.
- Iwanaga, J., Loukas, M., Dumont, A.S. and Tubbs, R.S. (2021). [A review of anatomy education during and after the COVID-19 pandemic: revisiting traditional and modern methods to achieve future innovation](#). *Clinical Anatomy*, 34(1): 108-114.
- Jones, D.G. and Whitaker, M.I. (2012). [Anatomy's use of unclaimed bodies: reasons against continued dependence on an ethically dubious practice](#). *Clinical Anatomy*, 25(2): 246-254.
- Korf, H.-W., Wicht, H., Snipes, R.L., Timmermans, J.-P., Paulsen, F., Rune, G. and Baumgart-Vogt, E. (2008). [The dissection course: necessary and indispensable for teaching anatomy to medical students](#). *Annals of Anatomy*, 190(1): 16-22.
- McLachlan, J.C., Bligh, J., Bradley, P. and Searle, J. (2004). [Teaching anatomy without cadavers](#). *Medical Education*, 38(4): 418-424.
- Moro, C., Štromberga, Z., Raikos, A. and Stirling, A. (2017). [The effectiveness of virtual and augmented reality in health sciences and medical anatomy](#). *Anatomical Sciences Education*, 10(6): 549-559.
- Riederer, B.M., Bolt, S., Brenner, E., Bueno-López, J.L., Circulescu, A.R.M., Davies, D.C., et al. (2012). [The legal and ethical framework governing body donation in Europe: 1st update on current practice](#). *European Journal of Anatomy*, 16(1): 1-21.
- Spitzer, V., Ackerman, M.J., Scherzinger, A.L. and Whitlock, D. (1996). [The Visible Human Male: a technical report](#). *Journal of the American Medical Informatics Association*, 3(2): 118-130.
- Sugand, K., Abrahams, P. and Khurana, A. (2010). [The anatomy of anatomy: a review for its modernization](#). *Anatomical Sciences Education*, 3(2): 83-93.
- Turney, B.W. (2007). [Anatomy in a modern medical curriculum](#). *Annals of the Royal College of Surgeons of England*, 89(2): 104-107.
- Wilson, A.B., Miller, C.H., Klein, B.A., Taylor, M.A., Goodwin, M., Boyle, E.K., et al. (2018). [A meta-analysis of anatomy laboratory pedagogies](#). *Clinical Anatomy*, 31(1): 122-133.
- Winkelmann, A. (2007). [Anatomical dissection as a teaching method in medical school: a review of the evidence](#). *Medical Education*, 41(1): 15-22.
- Zhao, J., Xu, X., Jiang, H. and Ding, Y. (2020). [The effectiveness of virtual reality-based technology on anatomy teaching: a meta-analysis of randomized controlled studies](#). *BMC Medical Education*, 20: 127.

Cite this article as: Bouchard A., Fernandez T. and Berg G. (2026). [Rethinking Cadaveric Dissection in an Era of Virtual Reality and Body Donor Shortages](#). *International Journal of Clinical Anatomy and Physiology*. 1(1), 26-30. doi: 10.62715/ijcap.2026.v1.i1.pp26-30