

Enhancing Student Accountability for Dissections in Pre-Clinical Curriculum: Proposing a Model for Programs with no Practical Exams

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ABSTRACT

Introduction: The scope for anatomy practical exams in modern student-centered teaching-learning curricula has been drastically reduced due to different reasons. This short scholarly perspective hypothesizes a mechanistic model that may improve outcomes from dissection-driven anatomy curricula that do not have practical examinations built into the lab-time. While the proposed model could on one hand enhance the sense of accountability in students to their in-lab dissection activities, on the other hand it may help optimize the learning process in the gross anatomy lab while achieving optimal usage of donor resources, as envisioned in this proposal.

Keywords: Accountability; Gross anatomy; Dissection; Rotation; Multi-donor exposure.

Introduction

The understanding of anatomy, as a foundational knowledge base, is fundamental to medical practice. Accordingly, dissection has been an integral part of the art and science of learning anatomical principles and content¹. However, recent shifts in approach from a traditional lecture-lab curriculum to newer and hybrid teaching and learning format of instruction such as problem-based and team-based learning, has often resulted in significant reduction or even complete omission of cadaveric dissections and practical exams as a system of learning anatomy².

Although the debate for and against the benefits and advantages of using donor material for dissection or prosection-based teaching has been in the horizon for some time now, most medical school curricula for anatomy still involve working with cadaveric material as a time-trusted tool preparing students for real-life encounters with actual patients (and human tissue) in their professional training following soon after the pre-clerkship period. Millennially, most millennial students do realize that there are obvious benefits of learning anatomy by dissection³. Studies have also shown that innovative design of dissection activities involving discussion of relevant clinical material makes the process more interesting^{4,5}.

Short Communication

Unlike with the traditional curriculum, most modern anatomy teaching-learning programs function within customized integrated curricula. Accordingly, there is enough room to innovate, integrate and

synchronize anatomy teaching with the rest of the curriculum. However, with reduced emphasis on dissection, reduced time allocated to anatomy teaching, combined with availability of virtual and augmented-reality technology to learn 3D anatomy, our perceptions about the benefits of working on the cadaver are changing very fast. Moreover, reduced expectations and emphasis on dissection-based learning outcomes have further decreased the efficacy of dissection as a tool to learn anatomy⁶. On top of that, abandoning practical examination as a tool for evaluation at the end of instructional units has further eroded the significance of dissection as a learning process. Accordingly, students often feel demotivated, uninspired, and unaccountable towards their dissection activity in the lab. This not only denies the students of taking advantage of the cadaveric material for a great learning experience, but also undermines utilization of the precious gift made by the donor.

Understanding that reintroduction of practical examinations at the end of gross-anatomy dissection blocks may not be feasible within the time-strapped mechanics of integrated curricula, the following proposal is being offered as an attempt to improve the output of dissection activities in the gross anatomy lab, improving retention of associated didactic information, and concomitantly, enhancing the sense of accountability towards dissections and to the donors, in the student⁷.

Discussion

The proposed model: Student groups working together in the gross-anatomy lab would be rotated

from one donor to the next (Fig.1) every week (or two) depending on the volume of the overall dissection work, over the semester. Students will be accountable for completing their work up to the desired level as expected in the dissector. This work will be verified using a checklist of essential structures (as determined from the dissector) by the peer-group taking over the donor for further dissection in the subsequent week. This mechanism should potentially help the in-lab dissection work in the following ways:

1. This model would ensure student accountability to complete their work before handing over the donor to the incoming peer group and moving on to the next donor. The dissection performance of the groups may be tracked through the semester by peers, teaching assistants or faculty using a simple metric that includes overall quality and timely completion of assigned work.

2. This mechanism would help students to explore structures in different donor contexts. The rotation system will provide the students a chance to work on multiple donors, thereby providing them opportunity and exposure to encounter and examine different donors as different patients with very different sets of health and life stories.

3. Following a rotation system would greatly enhance student opportunity to detect, examine and compare different anatomical variations in the donors. Since variabilities in clinical presentations are significantly linked to atypical or variant anatomy, the scope to facilitate awareness and appreciation of such variations could be a major advantage of the proposed model⁷.

4. Student rotations would allow students to inspect evidence of surgical procedures, examine a variety of implants and prosthetics in the donors, as they work through different donors every week. This would potentially allow further discussion on the relevant anatomy related to these procedures⁸.

5. Very pragmatically and importantly, the proposed system would provide the mechanism and flexibility to work around donors with different structural abilities. Students working on specific donors with limb and/or organ amputations, morphological anomalies, scars, contractures, wounds, muscle necrosis etc. for an entire semester may find this situation a disadvantage to their anatomy learning experience⁹. Implementing this model would provide all students flexibility to work at different donors in different weeks. On the flipside, students coming to work on donors with different structural abilities will work through them for a week.

Additionally, implementing this rotation system would improve peer-interaction and collective learning experience if students could be encouraged to discuss their observations from different donors, specifically the ones with interesting clinical anatomy correlations. Student experiences could also be collated to generate scholarly efforts in medical education research¹⁰. Operationalizing this idea would not only be potentially beneficial to the students in ways (including fruitfully and efficiently utilizing the precious gifts from the donors) discussed in this proposal but could also be instrumental in ensuring absolute completion of the dissection work in the lab, as the best mark of respect to our donors. There are no conflicts of interest associated with this manuscript.

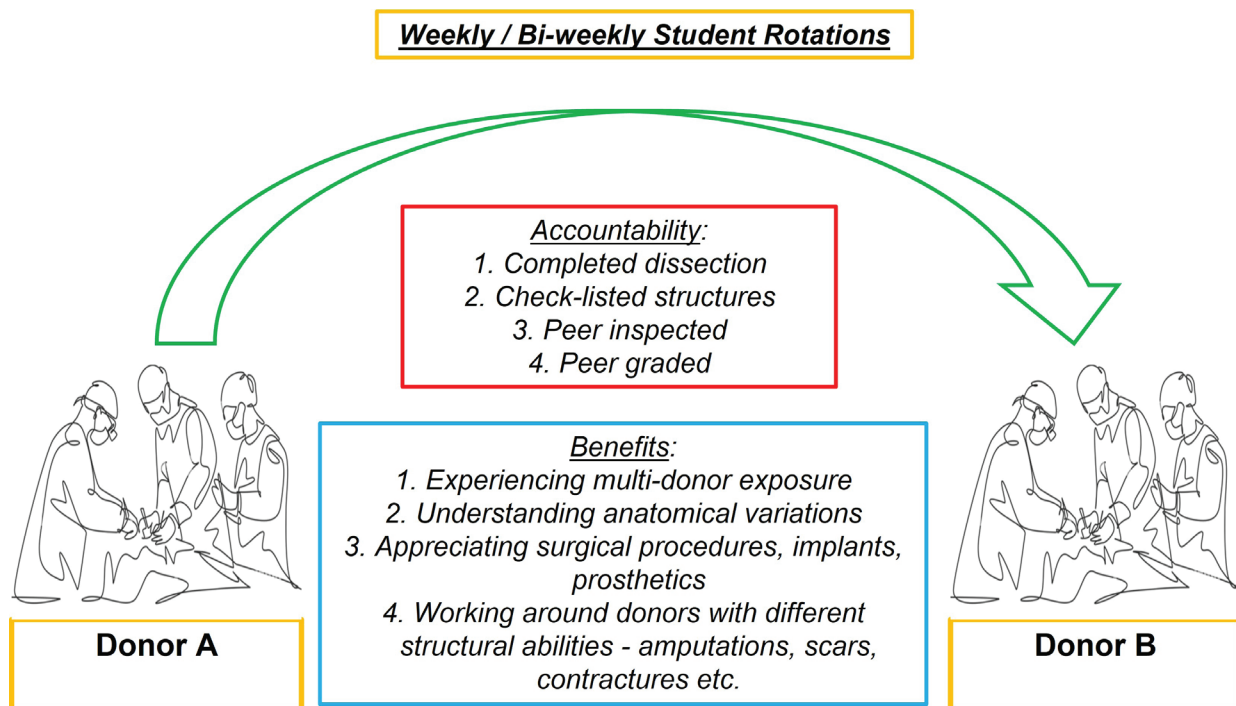


Figure 1. Essential features of the suggested rotation model to enhance student accountability to dissection and improving the learning outcomes in a anatomy teaching program without in-built practical examination.

References

1. Azer SA, Eizenberg N. Do we need dissection in an integrated problem-based learning medical course? Perceptions of first-and second-year students. *Surgical and Radiologic Anatomy*. 2007;29(2):173-180.
2. Changmai M, Gohain K. Cadaveric dissection and changing perceptions in learning anatomy. *Journal of Datta Meghe Institute of Medical Sciences University*. 2019;14(4):365-369.
3. Ghosh SK. Lacunae regarding dearth of dissection-based teaching during COVID-19 pandemic: how to cope with it? *Surgical and radiologic anatomy* : SRA. 2022;44(1):75-79.
4. Jeyakumar A, Dissanayake B, Dissabandara L. Dissection in the Modern Medical Curriculum: An Exploration into Student Perception and Adaptions for the Future. *Anatomical sciences education*. 2020;13(3):366-380.
5. Bergman EM, de Bruin ABH, Herrler A, Verheijen IWH, Scherpbier AJJA, van der Vleuten CPM. Students' perceptions of anatomy across the undergraduate problem-based learning medical curriculum: a phenomenographical study. *BMC Medical Education*. 2013;13(1):152.
6. Lackey-Cornelison WL, Bauler LD, Smith J. A comparison of the effectiveness of dissection and prosection on short-term anatomic knowledge retention in a reciprocal peer-teaching program. *Advances in Physiology Education*. 2020;44(2):239-246.
7. Parker E, Randall V. Learning Beyond the Basics of Cadaveric Dissection: a Qualitative Analysis of Non-academic Learning in Anatomy Education. *Medical Science Educator*. 2021;31(1):147-153.
8. Johnson JH. Importance of dissection in learning anatomy: personal dissection versus peer teaching. *Clinical anatomy*. 2002;15(1):38-44.
9. Nwachukwu C, Lachman N, Pawlina W. Evaluating dissection in the gross anatomy course: Correlation between quality of laboratory dissection and students outcomes. *Anatomical sciences education*. 2015;8(1):45-52.
10. Dissabandara LO, Nirthanan SN, Khoo TK, Tedman R. Role of cadaveric dissections in modern medical curricula: a study on student perceptions. *ACB*. 2015;48(3):205-212.

Mini Curriculum and Author's Contribution

1. Niladri Kumar Mahato MBBS MS DNB Ph.D. Contributions: Enhancing Student Accountability for Dissections in Pre-Clinical Curriculum: Proposing A Model for Programs with No Practical Exams; literature search, interpretation, preparation of draft manuscript, critical review and final approval. ORCID: 0000-0001-5439-1172

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