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Curtin University
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Best Evidence of Anatomy Education? Insights from the Most Recent Literature

To the Editor, *Anatomical Sciences Education*:

Anatomy is considered a cornerstone of medical education (as well as of related health and biomedical disciplines); nevertheless, in the past few decades it has witnessed a gradual decrease in time dedicated for anatomy learning and teaching (Bergman et al., 2008; Drake et al., 2009; Louw et al., 2009; Craig et al., 2010; Chan and Pawlina, 2015). Traditional anatomy education based on regional and structural anatomy taught in lectures and gross dissection classes has been replaced by a multiple range of study modules, including problem-based learning, plastic and 3D-printed models or computer-assisted learning, and curricula integration. An unresolved question in modern anatomy teaching (and, even more importantly, learning) is the validity of different anatomical pedagogies and the supposed to be superior effectiveness of dissection versus other tools that are now extensively utilized in biomedical education (Winkelmann, 2007; Meral Savran et al., 2015; McMenamin et al., 2016). A previous survey among European anatomy educators (more than 100) from higher education institutions indicated a strong general favor toward the use of cadaveric dissection above the other teaching methods (Patel and Moxham, 2008). The same study was much less clear-cut when individual learning outcomes where considered: minimal changes were measurable between teaching methods when assessing learning outcomes related to the acquisition of anatomical knowledge (Patel and Moxham, 2008).

Two recent publications (Losco et al., 2017; Wilson et al., 2017) address in a convincing manner this problem and have to be considered an important milestone in the field of anatomical (and biomedical) education. The herculean efforts of the two groups specifically encompass a survey of the literature of over 70 years for Losco et al. (2017) (until August 2015) and a meta-analysis of over 50 years for Wilson et al. (2017) (until December 2015).

The two studies were carefully designed and implemented, trying to minimize methodology limitations and statistical bias. What we can gather from these two timely studies? Interestingly, both studies started from a wide array of literature (almost 18,000 studies in Losco study and over 3,500 for the Wilson study), but the considered literature at the final stage yielded 29 studies for the former and 27 for the latter. Probably, these results are linked not only to redundant literature and stringent inclusion criteria but also are related to the objective barriers in designing high quality research education (subject numbers, ethical considerations) that hampered the overall value of the majority of published studies.

Of note (and probably surprisingly), dissection was not superior (and neither inferior) to other teaching tools in anatomy learning as stated by Wilson et al. (2017) and the use of nondissection-based learning tools was not detrimental for students in their academic performance. The authors note that these results refer to a short term survey and we are not sure of a long term retention influence of the several tools. It is conceivable that dissection practice could be important for long term performance and probably be more engaging in certain scenarios (such as in medical school), but these statements are not really proven by the reviewed literature at the moment.

Both surveys agree that active learning and the plethora of new computer-aided digital tools are an important factor in improving the learning process and are viable and effective in anatomy learning and teaching. Curriculum integration and a flexible use of all the various tools that we have today is a good way to implement anatomy education and personalized learning: it is probably a matter of "how to use it" above all (see Bergman, 2015).

As highlighted by the authors of both studies, we need a long-term survey of the various methods that we are implementing as well as a careful weight of the assessments that verify long term retention. These latter developments, together with a strong commitment to improve the quality of educational research, will be pivotal in leading us to the best practices in anatomy teaching. Notwithstanding the limitations of the two studies, we have now a trajectory thanks to Losco et al. (2017) and Wilson et al. (2017) that will help us in reaching the authentic learning in anatomy (with substantial benefit in related biomedical disciplines) in a period of limited resources and increasing expectations (Pawlina and Drake, 2016).

Mauro Vaccarezza, M.D., Ph.D.
School of Biomedical Sciences,
Faculty of Health Sciences, Curtin University,
Bentley, Perth, Western Australia, Australia

***Correspondence to: Dr. Mauro Vaccarezza, School of Biomedical Sciences, Faculty of Health Sciences, Curtin University, Bentley, Perth, Western Australia, Australia. E-mail: mauro.vaccarezza@curtin.edu.au**

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LITERATURE CITED

Bergman EM. 2015. Discussing dissection in anatomy education. Perspect Med Educ 4:211–213.

Bergman EM, Prince KJ, Drukker J, van der Vleuten CP, Scherpbier AJ. 2008. How much anatomy is enough? Anat Sci Educ 1:184–188.

Chan LK, Pawlina W (Editors). 2015. Teaching Anatomy: A Practical Guide. 1st Ed. New York, NY: Springer International Publishing. 403 p.

Craig S, Tait N, Boers D, McAndrew D. 2010. Review of anatomy education in Australian and New Zealand medical schools. ANZ J Surg 80: 212–216.

Drake RL, McBride JM, Lachman N, Pawlina W. 2009. Medical education in the anatomical sciences: The winds of change continue to blow. Anat Sci Educ 2:253–259.

Losco CD, Grant WD, Armson A, Meyer AJ, Walker BF. 2017. Effective methods of teaching and learning in anatomy as a basic science: A BEME systematic review: BEME guide no. 44. Med Teach 39:234–243.

Louw G, Eizenberg N, Carmichael SW. 2009. The place of anatomy in medical education: AMEE Guide no 41. Med Teach 31:373–386.

McMenamin PG, Eizenberg N, Buzzard A, Fogg Q, Lazarus M. 2016. A broad perspective on anatomy education: Celebrating teaching diversity and innovations. Med J Aust 204:57

Meral Savran M, Tranum-Jensen J, Frost Clementsen P, Hastrup Svendsen J, Holst Pedersen J, Seier Poulsen S, Arendrup H, Konge L. 2015. Are medical students being taught anatomy in a way that best prepares them to be a physician? Clin Anat 28:568–575.

Patel KM, Moxham BJ. 2008. The relationships between learning outcomes and methods of teaching anatomy as perceived by professional anatomists. Clin Anat 21:182–189.

Pawlina W, Drake RL. 2016. Authentic learning in anatomy: A primer on pragmatism. Anat Sci Educ 9:5–7.

Wilson AB, Miller CH, Klein BA, Taylor MA, Goodwin M, Boyle EK, Brown K, Hoppe C, Lazarus M. 2017. A meta-analysis of anatomy laboratory pedagogies. Clin Anat (in press; doi:10.1002/ca.22934).

Winkelmann A. 2007. Anatomical dissection as a teaching method in medical school: A review of the evidence. Med Educ 41:15–22.