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Editorial

Anatomy Past and Present: Evolution of Curriculum and Teaching in Anatomy

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Introduction

The teaching of anatomy is undergoing evolution. The evolutionary trends have seen the introduction of newer methods, approaches, philosophies, and strategies for building curricula in anatomy. The learning of anatomy is based on an educational curriculum that has traditionally contained gross anatomy, histology and embryology. In the traditional curriculum, students learn highly detailed information about the body organs and systems, its microscopic appearance, and the developmental processes leading from fertilization to fetal maturity. Information in gross anatomy is presented and learned using a regional approach i.e. body systems such as limbs and thorax are studied as units, with a broad emphasis on regional morphology and spatial relationships between organs [1-3]. Learning of anatomy today has gradually become influenced by other factors such as increasing cost, reduced time and limited resources. This has had a modifying influence on the curriculum [1,2]. Less but clinically relevant information is delivered, using approaches that are designed to optimize and integrate the learning and understanding of anatomy with other courses.

Integration of learning

The traditional anatomy curriculum consists of independent courses in anatomy, histology and embryology [2]. Correlation and alignment of teaching and learning occur between these units but seldom across other basic science courses such as physiology or biochemistry. The current educational trend for anatomy curricula is towards delivery of reduced information and material using approaches that allow integration and alignment of teaching with other basic science courses [2,4]. It could be argued that this trend developed as a result of the challenges of reduced time, limited resources and increasing cost. However, these integrated approaches to learning the basic sciences provide students with the benefit of developing skills that are required during subsequent clinical training [5-7]. These approaches are usually accompanied with an emphasis on functional and clinical relevance.

Instructional formats

For schools with large student enrolment in anatomy courses, the traditional instructional format is primarily lectures in a classroom, as well as laboratory sessions involving formalin-embalmed human cadaveric dissection, including use of prospected material. A typical schedule involves delivery of lectures in a classroom in a large group setting so that all students receive information at the same time. This is often followed by hands-on cadaveric dissection guided and directed by faculty and printed dissecting guides [1,2,8]. Associated with cadaveric dissection is the requirement for a statute-regulated body donor program. With access to cadaveric material, many schools also provide complementary teaching with prospected material as well as plastination of very well prepared and dissected material. Plastic models, radiographs and sessions on surface anatomy also form part of the traditional approach. Microscopic anatomy involves the examination by students of stained tissues mounted on glass slides. During embryology labs, students examine fetal specimens and sectioned tissues [9].

Despite the trend towards integration of curricular content, many schools have continued to maintain their body donor programs for dissection-based teaching. However some of the newer schools that have opened in the past 10 years have been unable to access donor programs and have developed alternative approaches and various digital resources to replace the hands-on dissection component of the traditional gross anatomy course [10-12]. Technology is employed to help address resource deficits. Digital image banks now substitute for microscopy slides and are most often delivered through network systems for onsite and offsite online access with a computer or digital device (computer-aided instruction) [13,14]. Use of alternative approaches is also applied to teaching methods, with the result that methods such as problem-based learning, team-based learning, case-based learning, and the flipped classroom have become increasingly common in the teaching of anatomy [3,6-8,15-19].

Assessment

Traditionally, anatomy is assessed as independent units of learning, so that a student either achieves or does not achieve the required standards in gross anatomy, histology or embryology. Learning and the acquisition of knowledge is assessed by written and practical examinations [20,21]. Practical assessment involves tagging of specimens, labeling of slides in a microscope, and a system of ensuring that all students can be assessed on dissected material or histologic sections using microscopes. With the newer approaches in teaching, assessments have evolved to include the use of technology and testing facilities such as computer-based testing, and the use of digital images [11,13].

Resources

An important requirement in the traditional teaching of anatomy has always been the availability of resources, specifically body donor programs, dissecting room facilities, faculty for labs, and curricular time. The ability to offer dissection-based gross anatomy requires that medical schools set up or obtain access to body donor programs

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for the continuous and steady provision of cadavers for study by students. Medical schools have to plan for the structural provision of a physical dissecting laboratory (formalin procurement and storage, formal systems in place for ensuring proper burial of donors, etc) [10,11]. This significant investment in resources for dissection offers students the opportunity to learn anatomy by touching human tissue, and facilitates early acquisition of physical and clinical skills as well as basic instrumentation.

For traditional histology teaching, investment in microscopy and glass slides is significant and offers students the chance to learn microscopy as well as microscopic anatomy, and facilitates the acquisition of physical skills for laboratory work. In anatomy curricula that are not dissection-based, resources requirements are technology-based and include provision and availability of computer facilities and networks, deployment systems, and technical support [10]. Considerable curricular and faculty time is also required for many of the newer teaching approaches that are associated with curricula that are not dissection-based because they often involve multiple offering of sessions or labs.

Conclusion

Traditional curricula for anatomy contain simple arrangements of units of learning with limited integration. Provision and maintenance of dissecting facilities and glass microscopy are significant resource requirements, as is the need for faculty and scheduling time. The use of technology in instruction and assessment in newer curricular arrangements has led to increased investment in technology for the teaching of anatomy. Many schools have computer-based exam facilities that have led to increased efficiencies for test taking, and reporting of grades. However, technology is constantly evolving, so the need for upgrading of facilities has been more frequent than is usually planned for. Strategies for examining and evaluating anatomy curricula are necessary in order to determine and identify efficiencies and better delineate learning benefits to students.

References

1. Drake RL, McBride JM, Lachman N, Pawlina W. Medical education in the anatomical sciences: the winds of change continue to blow. AnatSci Educ. 2009; 2: 253-259.
2. Drake RL, McBride JM, Pawlina W. An update on the status of anatomical sciences education in United States medical schools. AnatSci Educ. 2014 [in press].
3. Wang J, Zhang W, Qin L, Zhao J, Zhang S, Gu J, et al. Problem-based learning in regional anatomy education at Peking University. AnatSci Educ. 2010; 3: 121-126.
4. Johnson EO, Charchanti AV, Troupis TG. Modernization of an anatomy class: From conceptualization to implementation. A case for integrated multimodal-multidisciplinary teaching. AnatSci Educ. 2012; 5: 354-366.
5. Keim Janssen SA, VanderMeulen SP, Shostrom VK, Lomneth CS. Enhancement of anatomical learning and developing clinical competence of first-year medical and allied health profession students. AnatSci Educ. 2014; 7: 181-190.
6. Gregory JK, Lachman N, Camp CL, Chen LP, Pawlina W. Restructuring a basic science course for core competencies: an example from anatomy teaching. Med Teach. 2009; 31: 855-861.
7. Drake RL. A unique, innovative, and clinically oriented approach to anatomy education. Acad Med. 2007; 82: 475-478.
8. Nieder GL, Parmelee DX, Stolfi A, Hudes PD. Team-based learning in a medical gross anatomy and embryology course. Clin Anat. 2005; 18: 56-63.
9. Moraes SG, Pereira LA. A multimedia approach for teaching human embryology: Development and evaluation of a methodology. Ann Anat. 2010; 192: 388-395.
10. Aragão JA, Fonseca-Barreto AT, Brito CJ, Guerra DR, Nunes-Mota JC, Reis FP. The availability of teaching-pedagogical resources used for promotion of learning in teaching human anatomy. Adv Med EducPract. 2013; 4: 157-163.
11. Khot Z, Quinlan K, Norman GR, Wainman B. The relative effectiveness of computer-based and traditional resources for education in anatomy. AnatSci Educ. 2013; 6: 211-215.
12. Preece D, Williams SB, Lam R, Weller R. "Let's get physical": advantages of a physical model over 3D computer models and textbooks in learning imaging anatomy. AnatSci Educ. 2013; 6: 216-224.
13. Gadbury-Amyot CC, Singh AH, Overman PR. Teaching with technology: learning outcomes for a combined dental and dental hygiene online hybrid oral histology course. J Dent Educ. 2013; 77: 732-743.
14. Tian Y, Xiao W, Li C, Liu Y, Qin M, Wu Y, et al. Virtual microscopy system at Chinese medical university: an assisted teaching platform for promoting active learning and problem-solving skills. BMC Med Educ. 2014; 14: 74.
15. Vasan NS, DeFouw DO, Holland BK. Modified use of team-based learning for effective delivery of medical gross anatomy and embryology. AnatSci Educ. 2008; 1: 3-9.
16. Shankar N, Roopa R. Evaluation of a modified team based learning method for teaching general embryology to 1st year medical graduate students. Indian J Med Sci. 2009; 63: 4-12.
17. Vasan NS, DeFouw DO, Compton S. Team-based learning in anatomy: an efficient, effective, and economical strategy. AnatSci Educ. 2011; 4: 333-339.
18. Cowan M, Arain NN, Assale TS, Assi AH, Albar RA, Ganguly PK. Student-centered integrated anatomy resource sessions at Alfaisal University. AnatSci Educ. 2010; 3: 272-275.
19. Beale EG, Tarwater PM, Lee VH. A retrospective look at replacing face-to-face embryology instruction with online lectures in a human anatomy course. AnatSci Educ. 2014; 7: 234-241.
20. McNulty JA, Espiritu BR, Hoyt AE, Ensminger DC, Chandrasekhar AJ. Associations between formative practice quizzes and summative examination outcomes in a medical anatomy course. AnatSci Educ. 2014 [in press].
21. Smith CF, McManus B. The integrated anatomy practical paper: A robust assessment method for anatomy education today. AnatSci Educ. 2014 [in press].

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