

Editorial

The Upcoming Eon-Computer Aided Instruction (CAI) on Cadavers for learning Anatomy

Medical schools strive to provide quality education to the aspiring doctors in order to fulfill the social needs. For many clinical specialties, a good understanding anatomy is an indispensable tool to ensure safe and efficient clinical practice. Anatomy is the branch of science that deals with the structures of the body. Advancements in medical research, have led to voluminous information being added to anatomy continuously. This has led to the macroscopic, microscopic and developmental anatomy as special entities.

In the past decade, teaching of anatomy in undergraduate medical education has undergone considerable changes. Traditional cadaveric dissection has been replaced in many medical schools by innovative approaches, such as prosection models, problem based learning (PBL) and multimedia assisted learning. The driving forces behind these changes are shortage of cadavers, reduced teaching hours of anatomy in medicine and a desire to optimize recall of anatomical knowledge.

Even today in many medical schools, despite these hurdles cadaveric dissection remains the hallmark of anatomical teaching. Dissection includes involvement of medical students in meticulous and thorough cutting and opening of the human body, under the tutelage of anatomy experts in a laboratory setup. Cadaveric dissection was the paradigm of teaching anatomy since the time of renaissance. At one time dissection was an universal method to obtain competency in the field of medicine. However many medical schools report either a shortage of cadavers or find it difficult to maintain cadaveric bank as a result of strict regulations of governing bodies. Also the, toxicity of formalin used for preservation of the body has been the major challenge. Acute exposure to formalin produces immediate local irritation in mucous membranes of the eyes, nose and upper respiratory tract. Sometime individual experiences shortness of breath and wheezing which results in discomfort.

However anatomists still strongly believe the use of cadavers and cadaver based instruction teaching is necessary for under graduate medical

students and it acts as a gateway course to the medical field. In the perennial era of computer technology web based learning and usage of educational software has become an integral part of anatomy teaching. Internet usage and computer aided instruction (CAI) is becoming an important component of the medical education. Three dimension orientation of body parts, embryology animations and cutting of human body by click of a button has made a remarkable impact on anatomy learners. Many students of anatomy even use these tools for reinforcement of concepts. Detractors of CAI firmly believe that even computer simulates dissections in virtual environment may be available in future. However most of the anatomists emphasize that CAI can never replace the precious tangible experience that a student will have using a cadaveric dissection.

Saltarelli AJ et al, in their study have compared the effects of Anatomy and Physiology revealed (APR) multimedia learning system with a traditional method of dissection among students. APR is a modern based multimedia simulation that uses high resolution pictures to construct a prosected cadaver. APR also provides animations of specific anatomical structures with functional significance. The promising results were revealed with clarity of thoughts among the learners. But in contrast unable to explain the affective and psychomotor domain of the learner to establish rationality. It requires a careful alignment between learning objectives and assessment methods.

There is no ideal teaching or learning methods when it comes to imparting and assimilating anatomical knowledge. The aim of this study was not to establish the supremacy of one methodology over the other but to maximize the learning benefits available from the different methods. In an analysis of teaching and learning it is necessary to examine the curriculum, the mode of teaching, the quality with which it is delivered and the infrastructure facilities for its delivery. There is yet no convincing evidence on superiority of innovative method over traditional one. The new teaching modalities must be reassessed in terms of their effective-

ness in the assimilation of knowledge and their application in heal to sick.

Use of the modern technology to supplement medical education will better showcase new devices or tools by enhancing the training model. Digital simulators and synthetic models provide value to the learning process. Computer technology has provided an alternative to both cadavers and text books. Dissection has been an established and valued in Medical Education and has emphatically supported anatomists, surgeons and clinicians in their profession. A dissected cadaver remains the most captivating means of presenting anatomy. Dissection has survived the test of time and must not be dismissed as obsolete. Cadaveric dissections is still necessary to impart practical and theoretical skill and ethical practices among the beginners.

In conclusion, dissection has survived many historical periods, cultural changes and teaching trends and it will continue to evolve, as a new teaching technology. Thus complementary amalgamation of the two modalities would work best for the teachers as well as learners and will perhaps create an ideal situation for acquiring anatomical knowledge and skills. I certainly would not relish the thought of my attending surgeon having learnt his anatomy entirely from a computer.

Fig 1. Anatomy and Physiology Revealed (APR) multimedia learning system showing two lateral views of the vascular system in the head and neck.



(Source: Image courtesy of Michigan State University)

References

1. Saltarelli AJ, Roseth CJ, Saltarelli WA. Human cadavers Vs multimedia simulation: A study of student learning in anatomy. *Anat Sci Educ.* 2014; 7(5):331-39.
2. McLachlan J. C, Patten D. Anatomy Teaching: Ghosts of the Past, Present and Future. *Med Educ.* 2006;40:243-53

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