

Anatomy teaching: Flexnerian model to contextualized vertical integration?

Abraham Flexner in 1910 established the fundamental model where the subjects of anatomy, physiology, pharmacology, pathology and bacteriology are mastered before the clinical phase of medical training (1). He was clear that this mastery was best achieved by active student learning in the laboratory guided by clinical professors. Anatomy was the most developed basic science by this time. When the 1st teaching hospital in America was opening in Philadelphia in 1755, anatomic dissection was the scientific basis for the medical education (2). It remained so for hundreds of years until the last decade that saw its tremendous metamorphosis into a discipline in “crisis” and “a downward spiral” (3,4). The commentary by Ogeng’o in this issue of the *Annals of African surgery* is timely, thought provoking and an important contribution to the debate on how to train our residents in the changing scenario (5).

Flexner envisioned the acquisition of the knowledge of anatomy predominantly within dissection rooms and must have hoped that time allocation for this learning activity would be jealously protected. But, with explosion in medical knowledge, behavioural science, social science, epidemiology, biostatistics, ethics, cell/molecular biology and basic clinical skills crowded the pre-clinical timetables. As pointed out in the article in this issue, time allocated to the teaching of anatomy was affected (5). Flexner would not have minded if unnecessary anatomy detail that bore no relevance to later clinical practice was the casualty because “medical education ought to be explicitly conscious of its professional end and aim” (1). The loss was greater!

Progressively, less and less anatomy was being taught and at settings other than the dissection rooms. Traditional teaching was marginalized (3)

universally across North America, the UK, Europe, Asia and Australia. In place of cadaveric-based teaching emerged a plethora of study modules, problem-based curriculums, computers, plastic models and other tools (6,7).

Compounding the twin issues of time allocation and new teaching methods, the latter without validation for efficacy in knowledge transmission (3,8), the numbers of effective gross anatomy teachers was also dwindling. In many anatomy departments, the impetus for funded research and grants eroded the dominance of teaching.

The impact of these changes has been widely debated. Published evidence shows that many students are graduating from medical schools without adequate knowledge of anatomy considered necessary for safe clinical practice (9,10) while many trainees with poor knowledge of anatomy are becoming surgeons (3). Fortunately, the concerns have given way to some efforts to correct the situation. In the UK for example, the ongoing debate on a national core syllabus of anatomy to be delivered and assessed across the entire undergraduate curriculum is healthy (4). For surgical residency, formal anatomy training and assessment is being considered for specialist surgical trainees in their first year and evidence of detailed understanding of anatomy relevant to surgical practice before progression beyond the MRCS-UK demanded (4,11). The pendulum is swinging back! As dissection takes centre stage again, the cadaver will give back to the trainees a powerful tool to better define and interpret diagnostic images, conduct clinical examination and undertake interventional procedures (3,4).

In Kenya, and presumably the African continent, the Flexnerian model is still operative.

At the University of Nairobi, self-directed cadaveric dissection in the first year of undergraduate and postgraduate surgical training is reinforced by small group tutorials and class-wide applied anatomy overviews. The anatomy department also runs an intercalated BSc. Anatomy course, MSc Anatomy and PhD programs for selected students to learn anatomy beyond the “core”. There has been some discussions locally about the true value of cadaveric dissection. For those doubting, the reversal of trends in Europe and America should urge caution. New schools in Europe are re-embracing cadaveric dissection as the cornerstone of the teaching (7).

The author in this article (5) is calling for reinforcement of the anatomy knowledge beyond the first year. I support the vertical integration of clinically focused anatomy teaching to allow integration of knowledge in the context of increasing clinical experience. This system is in operation at the Brighton and Sussex Medical school where students return to the dissecting room in the later years of their training to study anatomy relevant to the area of their specialist rotation (7). This vertical integration would enrich surgical residency and encourage selected residents wishing to pursue more than the explicit formal program in surgical anatomy to take up intercalated MSc course in anatomy (5). From these, future teachers of the subject would be assured.

In conclusion, if anatomy teaching is to be taken beyond Flexner, it should be kept practical, relevant, and contextualized in the initial years then reinforced throughout the clinical years. Adequate facilities, competent faculty, bright and eager students are necessary pre-requisites to any educational structure (2). Hopefully, clinical teachers with the necessary background in anatomy would guide this process. The surgical residency programs and indeed other post-

graduate programs will benefit from a pool of trainees with good knowledge of anatomy who can take anatomy education to the level advocated in this issue of the *Annals of African Surgery*.

Hassan Saidi, BSc., MBChB, MMed, FCS, FACS
Senior Lecturer, Department of Human Anatomy,
University of Nairobi, Kenya.

References

1. Barbara Barzansky ed, Norman Gewitz: Beyond Flexner: Medical Education in the Twentieth Century. Greenwood Press, New York, 1992; Pg. 19.
2. O'Neill Hr J.A. Surgical education: Foundations and values. *J. Amer. Coll. Surg.* 2009; **208 (5)**: 653-662.
3. Older J. Anatomy: A must for teaching the next generation. *Surgeon.* 2004; **2(2)**: 79-90.
4. Susan Standing. New Focus on anatomy for surgical trainees. *ANZ J. Surg.* 2009; **79**: 114-117.
5. Ogengo J.A. Anatomy training for surgeons: which way for the future. *Ann. Afr. Surg.* 2009; **4**: 14-18.
6. Fitzgerald J.E.F., White M.J., Tang S.W., *et al.* Are we teaching sufficient anatomy at medical school? The opinions of newly qualified doctors. *Clin. Anat.* 2008; **21**: 718-724.
7. Evans D.J. and Watt D.J. Provision of anatomical teaching in a new British medical school: getting the right mix. *Anat. Rec. B. New Anat.* 2005; **284 (1)**: 22-27.
8. Winkelmann A. Anatomical dissection as a teaching method in medical school: a review of the evidence. *Med. Educ.* 2007; **41 (1)**: 15-22.
9. Waterson S.W. and Stewart I.J. Survey of clinician's attitudes to the anatomical teaching and knowledge of medical students. *Clin. Anat.* 2005; **18**: 380-384.
10. Spielmann P.M. and Oliver C.W. The carpal bones: A basic test of medical students and junior doctor's knowledge of anatomy. *Surgeon.* 2005; 257-259.
11. Rainsbury D. and Mahadevan V. The college launches national anatomy project. *Ann. R. Coll. Surg. Engl.* 2007; **89 (Suppl)**; 19.