

# Teaching of Anatomy in the new millennium

Bay B H, Ling E A

Somerset Maugham is well known for his literary skills as a best-selling author. But many may not know that he studied medicine and qualified as a surgeon at St Thomas's Hospital, London. It is no wonder that in his book "Of Human Bondage", Maugham wrote of a lecturer advising first-year medical students that, "You will have to learn many tedious things which you will forget the moment you have passed your final examination, but in anatomy it is better to have learned and lost than never to have learned at all".<sup>(1)</sup>

Anatomy has arguably the longest history as a discipline in formalised medical education.<sup>(2)</sup> Human anatomy is not just the study of structure or morphology but the human anatomist is likened to "a geographer of the human body".<sup>(3)</sup> Regarded as an integral component of the medical curriculum, a sound knowledge in human anatomy prepares the medical undergraduate for his future training in the clinical disciplines. However, the teaching of anatomy in the new millennium is facing significant changes.<sup>(4)</sup>

Paalman bemoans the "erosion of medical school gross anatomy", once considered the cornerstone in the first year medical curriculum, to a 4–5 week course "with little cadaver time" in some medical schools.<sup>(5)</sup> Cadaveric dissection has been a regular feature in anatomy teaching since the Renaissance.<sup>(2)</sup> In fact, dissection evolved into part of the culture in medical education. But is cadaveric dissection necessary for the learning of gross anatomy? Even within the anatomist community, there are differing viewpoints as to whether the new methods of teaching anatomy are better than the traditional use of cadaveric dissection. In a survey of 112 professional anatomists, Patel and Moxham found that the order of preference for teaching methods (in descending order) was cadaveric dissection by students, prosection, living and radiological anatomy, computer-aided learning (CAL), didactic lectures alone, and the use of models.<sup>(6)</sup> With the advent of technology, there has been an explosion of computer-based anatomy material which are made available. CAL such as online interactive programmes are useful tools in enhancing learning in the dissection laboratory.<sup>(7)</sup> However, CAL can never "fully replace the intellectual, educational and emotional experience afforded to medical students by cadaver dissection and even prosection".<sup>(5)</sup>

What then are the advantages of dissection? Dissection has been labelled as the "royal road"<sup>(8)</sup> and the cadaver as the "first patient".<sup>(9)</sup> In this issue of the Singapore Medical Journal, Prakash et al alludes to cadavers as "teachers in medical education".<sup>(10)</sup> Proponents for the use of dissection sees benefits such as the appreciation of three-dimensional relationships and anatomical variations in the human body, encouraging small group learning, developing fine motor control and promoting of professionalism.<sup>(2)</sup> Prakash et al<sup>(10)</sup> describes dissection as "a precious experience" not to be missed as cadaveric dissection has other learning outcomes besides anatomical learning, such as fostering teamwork and respect for the human body, integration of knowledge from textbooks and didactic lectures with practice.<sup>(11)</sup> However, the authors also acknowledge that there are barriers to the use of human cadavers for teaching.

The practical problems associated with dissection are:

- (1) Increased length of time required for study of anatomy by dissection. The current trend has been to downsize the anatomy course in the face of expanding curriculum goals and what has been termed "best medical education".<sup>(3)</sup>
- (2) Difficulties in acquisition of cadavers. Unlike in America where there is a successful body donor programme, many medical schools in this region (with the possible exception of Thailand)<sup>(12)</sup> face difficulties in obtaining enough cadavers for teaching.
- (3) Shortage of qualified anatomists.<sup>(2)</sup> In a survey conducted by the American Association of Anatomists, it was noted that 83% of heads of departments had great or moderate difficulty in the recruitment of qualified gross anatomy teachers.<sup>(13)</sup> There was also a perception that although there were seemingly enough anatomists being trained, many do not become teachers in gross anatomy for a variety of reasons. McCuskey et al pointed out that the anatomy teacher has a mean teaching commitment of 160 contact hours per academic year, far exceeding those who are expected to teach in other basic science disciplines.<sup>(14)</sup> The same authors also highlighted that with the "massive expansion of the research infrastructure" and

Department of  
Anatomy,  
Yong Loo Lin School  
of Medicine,  
National University  
of Singapore,  
4 Medical Drive,  
Blk MD10,  
Singapore 117 597

Bay BH, MBBS, PhD  
Associate Professor

Ling EA, PhD, DSc  
Professor and Head

Correspondence to:  
Dr Bay Boon Huat  
Tel: (65) 6156 6139  
Fax: (65) 6778 7643  
Email: antbaybh@  
nus.edu.sg

emphasis on research productivity for the promotion and tenure of faculty, many graduate students have turned away from becoming anatomy teachers.

Anatomy education is not only an essential part of the medical curriculum, but also helps to further the development of medical professionalism.<sup>(15)</sup> However, there are issues that have to be addressed. How will the changes in the teaching of Anatomy affect the training of medical students? And will the professional anatomist become a dying breed? Only time will tell.

## REFERENCES

1. Maugham WS. Of human bondage. Available at: [maugham.thefreelibrary.com/of-human-bondage/54-1](http://maugham.thefreelibrary.com/of-human-bondage/54-1). Accessed November 25, 2006.
2. McLachlan JC, Patten D. Anatomy teaching: ghosts of the past, present and future. *Med Educ* 2006; 40:243-53.
3. Guttman GD, Drake RL, Trelease RB. To what extent is cadaver dissection necessary to learn medical gross anatomy? A debate forum. *Anat Rec B New Anat* 2004; 218:2-3.
4. Ganske I, Su T, Loukas M, Shaffer K. Teaching methods in anatomy courses in North American medical schools: the role of radiology. *Acad Radiol* 2006; 13:1038-46. Comment in: *Acad Radiol* 2006; 13:1444.
5. Paalman MH. Why teach anatomy? Anatomists respond. *Anat Rec* 2000; 261:1-2.
6. Patel KM, Moxham BJ. Attitudes of professional anatomists to curricular change. *Clin Anat* 2006; 19:132-41. Comment in: *Clin Anat* 2006; 19:778-81; author reply 782-3.
7. Granger NA, Calleson DC, Henson OW, et al. Use of web-based materials to enhance anatomy instruction in the health sciences. *Anat Rec B New Anat* 2006; 289:121-7.
8. Newell RLM. Follow the royal road: the case for dissection. *Clin Anat* 1995; 8:124-7. Comment in: *Clin Anat* 1995; 8:128-33.
9. Coulehan JL, Williams PC, Landis DD, Naser C. The first patient, reflections and stories about the anatomy cadaver. *Teach Learn Med* 1995; 7:61-6.
10. Prakash, Prabhu LV, Rai R, et al. Cadavers as teachers in medical education: knowledge is the ultimate gift of body donors. *Singapore Med J* 2007; 48:186-90.
11. Lempp HK. Perceptions of dissection by students in one medical school: beyond learning about anatomy. A qualitative study. *Med Educ* 2005; 39:318-25.
12. Winkelmann A, Guldner FH. Cadavers as teachers: the dissecting room experience in Thailand. *BMJ* 2004; 329:1455-7. Erratum in: *BMJ* 2005; 330:82.
13. American Association of Anatomists. Survey of academic departments related to anatomy. Available at: [www.anatomy.org/Membership/survey\\_academic\\_departments.htm](http://www.anatomy.org/Membership/survey_academic_departments.htm). Accessed November 26, 2006.
14. McCuskey RS, Carmichael SW, Kirch DG. The importance of anatomy in health professions education and the shortage of qualified instructors. *Acad Med* 2005; 80:349-51.
15. Rizzolo LJ, Stewart WB. Should we continue teaching anatomy by dissection when...? *Anat Rec B New Anat* 2006; 289:215-8.