VIEWPOINT

What's wrong with the dead body?

Use of the human cadaver in medical education

Lisa M Parker

A 2000 survey of Australian medical schools showed that use of anatomical dissection and autopsies for teaching has declined. Opinions vary between schools as to the effect on teaching of anatomy and pathology. However, exposure to the dissected human body may have benefits beyond this teaching, including inculcating the trait of "detached concern", teaching about medical fallibility and uncertainty, and raising issues of death and dying. **(MJA 2002; 176: 74-76)**

DISSECTION OF THE DEAD human body has been central to medical education since the Renaissance. Anatomists of the past went to great lengths to obtain cadavers for student use, justifying even ethically dubious practices by extolling the extreme importance of dissection.[1,2] Early in the 20th century, all Australian medical students were expected to participate in the complete dissection of one or two bodies, in up to 700 hours of work.[3-5] Similarly, student attendance at, or performance of, hospital autopsies has been widely used by pathology departments to teach pathological concepts. Early Australian medical students were expected to attend both routine hospital autopsies and weekly teaching presentations.[3]

However, anecdotal evidence suggests a decline in use of human dissection and autopsies for teaching in Australian medical schools. This decline was confirmed by my survey of the 11 Australian medical schools in 2000 (Box). I discuss this change in medical education and its potential impact on the doctors of the future.

Declining use of the cadaver for teaching

The first medical school in Australia to offer a curriculum without compulsory anatomical dissection was the University of Newcastle school, which opened in 1978 with a radical new problem-based learning approach. Since then, eight of the 11 Australian medical schools have opted to dispense with compulsory anatomical dissection (Box). This change is partly due to philosophical changes in educational styles,[6] and also to increased competition for student time.[7,8]

Medical student attendance at autopsies is compulsory in five of 10 Australian medical schools, with one curriculum currently under preparation (Box). The major reason for the decreasing use of autopsies by university pathology departments is the decrease in the hospital autopsy rate, which declined from 45% in the 1970s to about 10% in 2000[9-11] (unpublished data). Other cited reasons include a general decreased emphasis on practical laboratory work; the growing field of non-autopsy pathology, including molecular and cellular pathology; and decreased interest in the autopsy among specialist pathologists.[11] Other curriculum pressures may be another important factor in Australian medical schools.

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Attitudes to dissection and autopsy

The despair of academics about the decreasing use of anatomical dissection and autopsies in medical education is widely quoted.[7,8,12-14] Many academics vocally support dissection of the human body as a teaching method. However, the attitudes of Australian academics vary (Box).

Less widely expressed are the attitudes of medical students and recent undergraduates to use of the dead body in medical education. Results of the few studies on student opinions are conflicting.[7,15,16] The emotional responses of students to the dissected body are more widely reported; several studies suggest that some students suffer stress reactions, which significantly impair their learning of anatomy and possibly even their ability to empathise with patients.[8,17] These reactions could perhaps be avoided by sufficient exploration of student emotions at the time.[8,18]

Effects of declining use of the cadaver

Anatomy

Many anatomists are adamant that dissection is the best way to learn anatomy,[14] although there is little hard evidence for this. In fact, many studies have suggested that medical students who learn human anatomy by prosections and audiovisuals perform just as well in anatomy examinations as those who learn by dissection.[19-21] Newer tools, such as plastinated models and computerised images, should also help compensate for a lack of "hands-on" dissecting experience.

Nevertheless, it is arguable that experience with dissection gives students a better appreciation of the three-dimensionality of the human body[22,23] and better understanding of normal variation in human anatomy.[24] These are important lessons that should not be overlooked.

Pathology

The autopsy has been used extensively for teaching pathological concepts, clinicopathological correlation and gross and microscopic anatomy, as well as for enhancing understanding of disease entities.[25] However, if autopsies are to be the primary means of teaching pathology, then students must witness many cases. As no Australian medical school requires students to attend more than six autopsies (Box), it seems obvious that other methods of teaching pathology have become widely accepted. The medical literature reports much sorrow about the decreasing hospital autopsy rate and the limited exposure of medical undergraduates to the autopsy,[11] and a significant number of Australian pathology

academics believe this has adversely affected pathology learning (Box). However, I was unable to find any studies investigating the relationship between student experience with autopsies and understanding of pathology.

Other lessons from the dead body

Arguably, anatomy and pathology can be taught effectively without student contact with the dissected human body. However, this does not mean that the human cadaver has nothing to teach medical students. Autopsies often uncover difficulties with clinical, radiological and in-vivo pathological diagnoses, and unsuspected major clinical conditions are still found with astounding regularity.[11] The autopsy therefore teaches the student about medical fallibility and uncertainty,[12,13,25,26] vital lessons for future doctors.

In addition, attending an autopsy gives first-hand understanding of the procedure — what it entails, how the body is likely to appear afterwards, and the benefits and limitations of the examination. Students also gain an understanding of the role of the autopsy in quality control[13,27] and research, and learn how and why to request permission for autopsy[13,16,28] and to discuss the procedure knowledgeably with relatives. These lessons are so important that it has been argued that lack of understanding of the autopsy by recent medical graduates, who have never attended one, has contributed to the decreasing autopsy rate.[13]

Finally, what of education about death? Medical students need to learn to deal with patients facing death, with grieving relatives, and with their own feelings of inadequacy, guilt and helplessness when confronted with dying patients. Few will have had close personal contact with death. Not all medical

Survey of use of human dissection and autopsies for teaching in Australian medical schools

Objective: To explore the use of anatomical dissection and autopsy in Australian medical schools, with particular reference to the teaching of anatomy and pathology, as well as the exposure of medical students to death.

Design: Questionnaire-based survey.

Setting and participants: Questionnaire was sent in 2000 to the heads of the anatomy and pathology departments in all 11 Australian medical schools.

Main outcome measures: Use of human dissection and autopsy as teaching tools in anatomy and pathology courses; formal teaching on death and dying in the medical course.

Results: *Anatomical dissection.* This is compulsory in three of 11 schools (Table). All schools said there are sufficient cadavers to meet their needs. Alternative practical methods used to supplement anatomy lectures include prosections, radiology, computer-simulated dissections, videos, models, living subjects/surface anatomy, embryology, museum specimens (including plastinated specimens) and clinicopathological correlation conferences. Respondents in four anatomy departments felt that teaching of anatomy was inadequate because of insufficient dissection (2 with elective dissection, 1 in transition to elective dissection and 1 with compulsory dissection).

Autopsies. Student attendance at autopsies is compulsory in five of 10 medical schools. Respondents in nine pathology departments indicated there are too few autopsies for teaching purposes, resulting in less pathology knowledge overall (3), deficits in clinicopathological correlation (3) and decreased knowledge of macroscopic pathology (2).

Benefits. Respondents listed a wide variety of benefits from direct exposure to the dissected body, including exploring issues of death and dying, teaching respect for the cadaver, increasing maturity and understanding the fallibility of the profession and legal implications of death and coronial law.

Formal death and dying sessions. These are offered in seven of 10 medical courses (1 unknown).

Conclusions: Exposure of students to human dissection and autopsies is no longer universal in Australian medical schools. In four schools it appears possible for students to complete medical training without exposure to dissection of the recently dead human body, and in at least two of these four schools they will not receive any formal teaching on death and dying.

Student experience with anatomical dissection, autopsies, death and dying in Australian medical schools

University	Course	Anatomical dissection by students	Autopsy attendance	Formal sessions on death and dying
Tasmania	6 y, traditional	Compulsory, whole body, 140 h	Not compulsory	No
Monash	6 y, systems-based/ traditional	Compulsory, most of body, 100 h	Compulsory	Yes (ethics lectures)
Melbourne	4.5 or 6 y, PBL	Compulsory, whole body, 43 h	Compulsory	Not known
Adelaide	6 y, traditional, changing to PBL (from 2000)	Old course: compulsory, whole body, 2 h/week. New course: elective	Not compulsory	No*
Flinders	4 y, systems-based, PBL	Elective, 60 h (chosen by 95%)	Not compulsory (1/3 attend voluntarily)	Yes (run by social work, psychiatry departments)
Sydney	4 y, PBL	Elective (chosen by 50%–60%)	Compulsory, 1–2	Yes
Western Australia	6 y, systems-based, PBL	Elective (chosen by 25%)	Compulsory, up to 6	Yes (other departments)
Newcastle	5 y, PBL	Elective (chosen by 20%)	Not compulsory	No
New South Wales	6 y, traditional	Elective, 1 week course (chosen by 20%)	Compulsory, 6	Yes (human behaviour course)
James Cook	6 y, systems-based (from 2001)	Not compulsory, elective may be offered in future	No response	No
Queensland	4 y, PBL	Not compulsory, no electives offered (students may volunteer to prepare prosections)	Not compulsory	Yes (program attached to ethics course)*

PBL = problem-based learning.
* Memorial services are held for donated cadavers used for dissection or prosection.

schools have formal teaching on death and dying (Box), and students report little experience with death during their medical school years.[29] In Australia, students in four medical schools can conceivably progress through their entire training without seeing a dead body (Box).

Is this important? Fox argues that the experience of viewing the dead body is an important tool in teaching medical students the trait of "detached concern",[26] an attitude that enables them to practise medicine efficiently and empathically, despite constant exposure to disease, suffering and death.[18] Others agree that the dissected body is a significant influence on student attitudes to death,[30] but are less enthusiastic than Fox about the lessons learnt. As mentioned earlier, contact with the cadaver can be highly stressful for some students,[8,14,16-18,31,32] and may result in their becoming "dehumanised"[33] — more "detached" than "concerned". However, this should not be used as an argument for withdrawing exposure to the dead body from the medical curriculum, but rather should encourage schools to introduce formal courses on death and dying.[16,18,29,31,34] The anatomical dissection or the autopsy are ideal focal points for discussion of these topics.[18,35]

Clinical competence

Perhaps the fundamental question is whether exposure to the dissected body, in anatomy, pathology or another course, contributes to the making of better doctors. In general, academics are unable to produce hard facts about the value of the dissected body in medical education. It has proved difficult to measure the success or otherwise of problem-based learning in producing "better" doctors,[36,37] and measuring the importance of one component of a medical course, such as student experience with anatomical dissection and autopsy, is similarly unrealistic. Cahill admits: "We [would] be more persuasive in convincing sceptics [of the value of anatomical dissection] if we [had] hard data that demonstrate[d] whether or not knowledge obtained by dissection is key to proper patient care . . . Who would fund a study to compare the clinical skills of physicians who dissected, versus those who did not?".[14]

I believe that students who have experience with the dead body will be better equipped to deal with issues surrounding death and more aware of medical uncertainty. This will make them better clinicians.

Conclusions

The responsibility for exposing students to the many lessons taught by the dead human body is poorly defined and appears to lie with neither the anatomy nor pathology departments. Consequently, such exposure may be overlooked. Perhaps an overseeing committee needs to consider this possibility and review policies within separate departments that have led to such an event. The live human body can teach students a great deal and is a constant focus in both new and old medical education philosophies. Surely, the dead human body should not be so completely overlooked. Even in busy undergraduate curricula it should be possible to find a place for the dead to teach the living.

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