

Implications of Changes in Work Practices for Anaesthesia Training in Australasia

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There have been several alterations in industrial work practices over the last decade that have reduced working hours for trainees in most medical specialties, including anaesthesia. Along with the expanded role of anaesthetists in pain management and peri-operative medicine, this has reduced the exposure of our trainees to clinical anaesthesia in operating theatres. At the same time there have been changes in surgical practices with more cases being managed non-invasively. These trends all have major implications for anaesthesia training. This paper aims to review the changes that have occurred, and to speculate on mechanisms to maintain the quality of anaesthesia training despite the reduced intra-operative clinical exposure.

CHANGES IN TRAINING CONDITIONS

Reduction in Trainee Working Hours

Long working hours have traditionally been a part of post-graduate medical education, with exposure to a large number of cases seen as the method for gaining adequate clinical experience to enable the trainee to be prepared for a consultant position. In many disciplines, long working hours were possibly viewed as a "rite of passage", and that only those who had survived this training would be suitable to be a specialist. Very little reform of working hours was initiated by the medical profession itself, despite the obvious fatigue issues, and the growing number of medico-legal decisions in which working hours were considered as a contributing factor in the judgment¹. Nevertheless, over the last decade, there have been significant reductions in recommended maximum working hours in most developed countries.

United Kingdom

The introduction of European Working Hours directives in the United Kingdom influenced the employment in hours of junior medical staff, despite attempts in 1996 by the British Government to challenge the law. The British Government had argued that the directive had been wrongly adopted as a health and safety measure, but this argument was dismissed by the European Court of Justice. This directive has seen a reappraisal of the concepts of on duty and on call work practices.

United States of America

In the United States, the death of Libby Zion prompted legislative change. Her father, an attorney and writer for the *New York Daily News*, ensured that appropriate investigation of her death took place². Her death and the issues surrounding it are well described in this reference, and make interesting reading with respect to the issues of fatigue and drug prescription. Zion was admitted to the New York Cornell Medical Centre with a high fever. She had a history of depression, and was taking a monoamine oxidase inhibitor. Her presentation was complicated by recent use of cocaine. She was prescribed intravenous fluids as part of her treatment. Despite treatment she remained febrile and suffered a cardiac arrest, from which she was unable to be resuscitated. Although in subsequent legal proceedings, there was initial focus on the administration of pethidine to a patient on a monoamine oxidase inhibitor and the patient's use of

cocaine, the issue of doctors' working hours and adequate supervision became prominent. This case led the New York State to form the Ad Hoc Advisory Committee on Emergency Services, more commonly known as the Bell Commission. This committee developed a series of regulations that addressed several patient care issues, including resident work hours.

The current directive of the US Medical Council for Graduate Medical Education stipulates hours that in Australasia would be considered excessive - residents to work no more than 80 hours per week, have shifts that are no longer than 24 hours, and have 10 hours of rest between shifts.

Australia

In Australia, lobbying for reform of work hours was initiated by the Australian Medical Association, in the form of their "Safe Hours" project, which was supported by grants from the Commonwealth Department of Health and Family Services. The Safe Hours campaign included a National Code of Practice, the design, testing and implementation of a methodology for risk rating the rosters of hospital doctors, and a communications strategy to promote awareness and activate change to work practices in hospitals. Industrial award changes have sought to penalise employers for prolonged working hours. An example of this is in the Western Australian Department of Health Medical Practitioners (Metropolitan Health Services) AMA Industrial Agreement 2004. This award provides for significant loadings to salaries if certain conditions are breached; amongst these are that in a 28 day employment cycle their should be eight days free from ordinary hours of duty, at least 12 evenings off on weekdays, and every second weekend free from duty. There are also salary loadings for not having at least 8 hours between shifts, exceeding 75 hours in a consecutive seven day period, and shifts longer than 15 hours.

New Zealand

In New Zealand, two coronial investigations highlighted fatigue; one into the suicide of a house surgeon, the other into the death of a woman who survived a motor vehicle accident, but died in hospital as a result of a mishap^{3,4}. Although it is difficult to collect data in this area, a New Zealand Government publication in 2005 reported that 83% of house officers, and 75% of registrars were working more than 50 hours per week⁵. Even if working hour reform in New Zealand may appear to be behind that of Australia, it is likely that working hours will reduce to approach those of Australia.

CHANGES IN THE SCOPE OF ANAESTHESIA PRACTICE

The changing practice of anaesthesia has also resulted in changes to work practices of trainees. The introduction of preadmission clinics to cater for day of surgery admissions, the establishment of acute pain services, rostering for simulation and other specific educational sessions, and the increasing use of anaesthetists to provide sedation for procedures outside the operating theatre have reduced the amount of clinical time that trainees spend in the operating theatre.

These changes all reflect changes to the practice of anaesthesia that our trainees are likely to encounter when they gain their fellowships, however they do impact on teaching time. The full significance of this impact is not known. The use of simulation may improve quality of training in exposing trainees to clinical scenarios that they may not meet in their training time.

For example, in Western Australia, it has been calculated that there has been a 25.8% reduction in the number of hours spent administering anaesthesia in operating theatres over the past 10 years⁶. This reflects the increased time spent by trainees in pain services, peri-operative medicine services, and preadmission clinics.

CHANGES IN THE SCOPE OF SURGICAL PRACTICE

Changes in the cope of surgical practice have changed the location and type of anaesthesia provided for procedures. There has been a major shift of work to the radiology suites with the development of less invasive techniques. For example, non invasive or minimally invasive techniques are now available for treating abdominal aortic aneurysms, carotid stenoses, coronary artery lesions, atrial septal defects, cerebral aneurysms and arteriovenous defects, and portal hypertension. Many procedures in the past used for treating these conditions required much

more complex anaesthesia with many anaesthesia interventions than that that is used for the less invasive techniques.

One other major factor affecting anaesthesia practice has been outside of anaesthetists' control. Changes in surgical practice with the development of subspecialised surgeons and procedural physicians and radiologists performing newer less invasive surgical techniques such as those listed above has meant that the extremes of the patient presenting for anaesthesia may be at extremes of pathophysiology which previously may have seen them at high risk from anaesthesia for complex procedures, or considered at too high a risk and denied a procedure.

CHANGES IN THE TRAINEES

Changes in the accreditation of trainees

Prior to the accreditation of hospital departments rather than positions by ANZCA in 2004, in many departments there were anaesthesia registrar positions that were not accredited for training. In some regions, it was not unusual for trainees to have spent time in these positions prior to being appointed to training schemes. The abolition of anaesthesia non-accredited registrar positions by ANZCA in 2004 along with the increased recognition of prior learning in other disciplines has seen a further reduction in the clinical experience gained by trainees.

Part time trainees

Another change has been the increased number of part time trainees in anaesthesia. Seven percent of Western Australian trainees were part time trainees in 2006⁶. Although ANZCA sets conditions for part time trainees to ensure that their clinical exposure includes all areas that a full time trainee would encounter, and seeks prospective approval prior to part time training commences, the impact of part time training on education within the ANZCA training scheme has not been assessed.

Implications for quality of training

Compared with anaesthesia training time in other countries and regions FANZCA training is lengthy at five years. It is extremely unlikely that working hours or training time will increase in the future. As such those involved in anaesthesia education and training will need to ensure that a similar standard of training is delivered to trainees in despite this reduced exposure.

MECHANISMS TO MAINTAIN QUALITY OF TRAINING

Recent Changes by ANZCA

The fellowship training programme of the ANZCA (FANZCA) is a five year training programme, of which a minimum of 33 months must be spent in clinical anaesthesia. It is not known on what working hours the development of the FANZCA programme was based; the methods of assessment have been examination success and signing off of training modules. Whilst the latter stipulates minimum numbers of sessions, it does not stipulate time equivalent to 33 months of anaesthesia.

ANZCA has been proactive in the field of education. Its activities have included the foundation of an Education Unit with a full time Director of Education, the establishment of Medical Education and Simulation Special Interests Groups, the development of the Clinical Teachers' Course and the Effective Management of Anaesthetic Crises Course (EMAC), the regular review of the Examinations process, and the introduction of the modular system of training with specific learning objectives that include personal and professional development.

It will be interesting to see if the first major review of the FANZCA training programme introduced in 2004, due to occur within the next 12 months, will assess the issue of reduced training hours.

Whilst these changes have strengthened the structure of the training programme, it remains that most clinical teaching is performed in the operating theatre environment. It could well be argued that this is a strength, not a weakness of our training programme. It could also be speculated that how teaching hospital departments and individual consultants respond to the reduction in hours that are available for our trainees to be taught the basis for safe, competent clinical anaesthesia will probably determine the quality of our trainees more than the changes to the structure of the training programme.

The EMAC course instructs in both the technical skills required in an emergency, but also the behavioural aspects of managing anaesthesia crises. Simulation courses in obstetric emergencies have been developed, and it would be expected that similar courses in other areas of anaesthesia may be developed in the future.

POTENTIAL CHANGES AT A HOSPITAL LEVEL

The FANZCA programme lists the attributes of a specialist anaesthetist as a Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar and Teacher, and Professional. Given this vast array of attributes, it is not expected that every appointment to a teaching hospital should be an expert in every area, but it is not unreasonable to expect a basic competency in this area. One such area is that of the Scholar and Teacher.

Medical Education has been a growing area, with the establishment of specific journals, university postgraduate certificates and degrees, and the development of courses such as "Teaching on the Run" and "Train the Trainer", and the College Clinical Teachers' Course. Mainstream medical journals have also taken an interest in medical education, such as the publication in the Medical Journal of Australia of a series of articles in medical education in clinical settings⁷. There is a large variety of opportunities for consultants in teaching hospitals to increase their skills in clinical education.

As with the issue of training hours, in the area of clinical teaching medical practitioners are at risk of having changes forced upon them, rather than of their own initiative. In November 2001, the final report of the Inquiry into obstetric and gynaecological services at King Edward Memorial Hospital (KEMH) 1900-2000 was released⁸. KEMH is the tertiary referral hospital for obstetric and gynaecological services in Western Australia. One of its recommendations was "that each doctor attend a Train the Trainer Course within 12 months of the date of this report". Given that this recommendation was made after an external review of a teaching hospital, should teaching hospitals in their selection criteria for specialist appointments list a commitment or demonstrated interest in medical education (such as attending a train the trainer course) as a criterion? I would also suggest that industrial contracts must also allow adequate resources for development and maintenance of education skills, as well as adequate non-clinical time in which to do so.

Changing education patterns in medical schools will also influence teaching. With the introduction of graduate medical schools, not all trainees will have had as extensive an education in basic sciences as those teaching them. It may be that basic science concepts will also need to be taught in the operating theatre to enable further learning of material for ANZCA examinations. This in no way reflects on the clinical competence of graduates from graduate medical schools.

Changes required of trainees

Registrars must seek ownership of their training, and assume responsibility for gaining the most out of all hospital rotations. Like consultants, they should be aware of the principles of adult education, and given that they too will be clinical teachers, should consider participating in a teaching course. Simple manoeuvres such as bringing the ANZCA curriculum module to the operating theatre and discussing a topic in each list with a consultant may ensure that all learning objectives of a module are covered during a rotation.

Trainees must also be aware that with a reduction of training hours, their exposure to procedures that are performed relatively infrequently will be further reduced. The importance of preparing appropriately for lists would be increasingly relevant for these occasions is reinforced. An example may be to refresh the anatomy of the bronchi prior to insertion of an endobronchial tube and the use of the fiberoptic scope to check position.

The Provisional Fellowship Programme allows trainees to attain extra skills in areas they may wish to specialise in the future, and should be considered for maximising exposure to areas that may not have been fully covered in the first four years of training, and in which a trainee may wish to further specialise. In past years, the scope of fellowships has extended from those traditionally seen in cardiac and neuro anaesthesia, to include amongst others regional, ultrasound, ambulatory, education, simulation, and airway fellowships.

Use of other teaching techniques

The reduction of time spent in the operating theatre in training has led to the recruitment of other teaching techniques. Simulation is one technique that has been used in many other industries, including aviation, finance and engineering, and it is being increasingly used in medicine.

Another recommendation from the King Edward Memorial Hospital enquiry was “anaesthesia staff are to be rostered to ensure that the registrars on night and weekend duty are sufficiently skilled to provide general anaesthesia for urgent emergency caesarean sections”. Obtaining skills in general anaesthesia for caesarean section is becoming increasingly difficult. Three years later the Victorian Consultative Council on Anaesthetic Mortality and Morbidity Report noted that “the use of regional anaesthesia in obstetrics has expanded enormously and, worldwide, almost all anaesthesia related maternal deaths are now associated with general anaesthesia (usually due to difficulties in airway management). One possible factor is the lack of experience now available for anaesthetists in general anaesthesia for obstetrics. However, general anaesthesia is still needed in some situations, and all anaesthetists undertaking obstetric anaesthesia should be aware of the particular risks and the need for clear protocols for managing a difficult airway”⁹. Here is the problem of providing experience and demonstrating competence in an anaesthetic technique where its overall use is decreasing.

An example of how to manage this issue is seen in the modifications of the anaesthetic rotation within the Western Australian Training Scheme to King Edward Memorial Hospital. For over 80% of our trainees, their total obstetric anaesthesia experience will be at that hospital. The term begins with pre-education, and attendance of a simulation course related to obstetric crisis management (including simulation of emergency general anaesthesia for caesarean section). There is also recognition of the importance of skills learnt prior to the term, such as rapid sequence induction. When teaching basic anaesthesia skills such as rapid sequence induction in a general setting, the concepts of its use in other patients such as the parturient can be taught. Whether this will enable our trainees to be in the words of the enquiry report, “sufficiently skilled”, is not known, as competency in itself is difficult to assess.

The reduction in training hours may also lead to minimum exposure to other anaesthesia techniques. In a study by Clarke and Gardner, we found that in an tertiary adult teaching hospital the exposure to fiberoptic intubation may be as low as 1.2 procedures per year, which with minimum time in spent in anaesthesia training may be as low as three fiberoptic intubations in total¹⁰. The use of any technique with its own risks when not clinically indicated poses an ethical dilemma for any consultant or registrar seeking to increase their experience in that technique. One way to increase trainees’ exposure is to allocate trainees to spend lists with respiratory physicians performing diagnostic bronchoscopies. Although the trachea is not intubated during a diagnostic bronchoscopy, there is still an opportunity for the trainee to practise topical anaesthesia for the airway, handling of the fiberoptic scope, passing the scope through the vocal cords, and familiarisation with bronchial anatomy. Similarly the use of training mannequins to develop these skills may be used.

Simulation experience is extending beyond the initial areas of anaesthesia crisis management to include teaching of clinical protocols, skills, communication and behaviour.

CONTINUING EDUCATION AND SKILLS ACQUISITION

Post graduate medical education will continue to evolve. The shortage of medical personnel and the pressure to produce specialists are unlikely to lead to a reversal of the decline in training hours or an increased training time for registrars.

Given that ANZCA has been proactive in revising its training programme and developing its education centre, it is unlikely the quality of new fellows will be any different to those who have trained previously. One thing that will be different will be that overall clinical experience will be less. Although trainees will have completed all modules in their training scheme, it may be unreasonable for departments to expect all new consultants to have reasonable experience in all facets of anaesthesia. This may have implications for departments in rostering of consultants and senior registrars and supervision of trainees, and may require credentialling of anaesthesia skills. Australia and New Zealand are not alone, and Greaves has commented that new consultants in the United Kingdom will be “less experienced and less confident that those of previous times, and as such that managers must make provision for them as they gain the additional experience that they will have missed out on as trainees”.

CONCLUSION

Change will continue to occur in anaesthesia training in Australasia, with changes forced upon us by external pressures as well as changes that Anaesthetists themselves will make to improve our training scheme. Our challenge is to develop our training methods to ensure that the quality of anaesthesia training in Australasia remains of the highest standard.

REFERENCES

1. Nocera A, Khursandi DS. Doctors' working hours: can the medical profession afford to let the courts decide what is reasonable? *MedJAust* 1998; 168:616-8,
2. Lerner BH. A Case That Shook Medicine - How One Man's Rage Over His Daughter's Death Sped Reform of Doctor Training. From <http://www.washingtonpost.com/wp-dyn/content/article/2006/11/24/AR2006112400985.html> Accessed June 2007
3. BMJ News Doctor's suicide prompts look at hours. *BMJ* 1994; 309: 1037
4. Holmes G, Junior doctors' working hours: an unhealthy tradition? *MedJAust* 1998; 168: 587-588
5. New Zealand Health Workforce Advisory Committee. Fit for purpose and fit for practice - A review of the Medical Workforce in New Zealand Consultation Document. From <http://www.hwac.govt.nz/publications/hwac-fitforpurpose-consultationdocument.pdf> Accessed June 2007
6. Chan SL, Gardner AI. A Comparison of Working Hours of WA Anaesthetic Training Scheme Registrars between 1996 and 2006. From <http://anzca.edu.au/2006asm/chan.pdf> Accessed June 2007
7. Lake FR. Teaching on the run tips: doctors as teachers. *Medical Journal of Australia* 2004; 180:415-6.
8. Inquiry into Obstetric and Gynaecological Services at King Edward Memorial Hospital 1990 – 2000. From <http://ww2.slp.wa.gov.au/publications/publications.nsf/Inquiries+and+Commissions> Accessed June 2007
9. Consultative Council on Anaesthetic Mortality and Morbidity. Eighth Report. From <http://www.health.vic.gov.au/vccamm/downloads/eighthrep.pdf> Accessed June 2007
10. Clarke RC, Gardner AI. Anaesthesia Trainees' Exposure to Airway Management in a Tertiary Adult Teaching Hospital. From <http://www.anzca.edu.au/2007asm/Clarke.htm> Accessed June 2007
11. Greaves JD. Training time and consultant practice *Br J Anaesth* 2005; 95:581-3