Techniques in medical education

Training in anaesthesia: the US perspective

TI Strang, DR Ball

There is currently much interest in the provision of postgraduate training in anaesthesia in the UK. The recent Royal College of Anaesthetists' document 'Specialist training in anaesthesia, supervision and assessment' has brought much debate concerning the future of anaesthesia training in the UK. We present a description of anaesthesia training in the US for discussion and comparison. US residency training is short and seamless. It is highly structured, but retains a capacity for specialisation. It may offer ideas for the future direction of training in the UK.

Keywords: anaesthesia, training, Calman report, US residency training

Summary

In the light of the recent Calman Report and the Royal College of Anaesthetists document 'Specialist training in anaesthesia, supervision and assessment', there is currently much debate concerning the future of anaesthesia training in the UK. We present a description of anaesthesia training in the US for discussion and comparison. US residency training is short and seamless. It is highly structured, but retains a capacity for specialisation. It may offer ideas for the future direction of training in the UK.

Medical school

After completing a university science degree in the US, students join medical school at an average age of 22 years. During the four-year course there is a two-week anaesthetic training module. This typically takes place in the third year and is followed by a multiple-choice questionnaire and airway skills exam. Motivated students may also elect to spend a further month in anaesthesia or intensive care teaching. All students must also qualify as Advanced Cardiac Life Support (ACLS) providers.

In the final year of medical school students decide upon their speciality and apply for residency training programmes. There is competition for the best programmes. Students are encouraged to make informal visits and meet existing residents and staff.

Departments produce glossy brochures full of programme details including academic biographies of the staff. Formal interviews are usual, but the final placement is based on the 'Match' - the National Residency Matching Program is a computer-based method of assigning students' choice of programme to the programmes' choice of student.

Internship

Once accepted for residency training, the student must apply for a one-year internship (house job) to follow satisfactory completion of medical school. The ABA states that this 'clinical base' year can be spent in medicine, surgery, paediatrics, obstetrics or family medicine (general practice). Some anaesthesia residency programmes have close links with other specialties to permit easier links between internship and residency.

Residency

Residency programmes are approved at a national level by two bodies, the Accreditation Council for Graduate Medical Education and the Joint Committee on Accreditation of Hospitals. The Liaison Committee of Medical Education, a branch of the American Medical Association, approves the educational content. Most programmes are based at university hospitals allied with others to create a training group or school of anaesthesia. Anaesthetic residency is seamless and short by UK standards, lasting three years.

BASIC ANAESTHESIA TRAINING

Basic anaesthesia training takes place in year one and is intended to emphasise basic and fundamental aspects of anaesthesia. The first month consists of an introductory period, beginning with three days of didactic lectures alone, followed the next week by daily light clinical duties and lectures. Residents then take a competency exam and start full on-call duties.

SUBSPECIALTY ANAESTHESIA TRAINING

Training in the second year is intended to teach the theoretical background and
subject material of anaesthetic subdisciplines such as that for paediatric, neurosurgical, ENT, and cardiothoracic surgery. These typically take the form of monthly modules. In addition, time is set aside for recovery room care, pain control and day case anaesthesia. There is in addition a mandatory two-month module spent in critical care.

ADVANCED ANAESTHESIA TRAINING
Since 1988, the ABA has stipulated a third year of advanced anaesthesia training (box 2).

Fellowship
After completing residency, candidates may work in an anaesthetic subspecialty as a fellow. These are often onerous jobs, but highly sought after. After one-year fellows may sit for the Certificate of Special Qualification in pain or critical care, once they become board certified.

Level of supervision
Residents are very closely supervised and supported. Consultants are physically present at all procedures including intubation, extubation and invasive line placement and must remain in the operating suite throughout the case. This corresponds to a ‘level 1’ supervision in the scheme proposed in the Royal College document and applies day and night.

During the introductory period the consultant will only be responsible for one resident’s operating room. New residents are also paired with more senior colleagues, so too more experienced colleagues are providing assistance. After a month the new resident works just with the consultant who typically then covers two operating rooms and residents.

Residents covering the recovery unit and cardiac arrests around the hospital are supervised by a consultant from within the operating area. Those on call for the pain services are supervised by a consultant based at home (ie, level 3). Final year residents or fellows are never used as junior consultants.

Teaching
There is a strong emphasis on study, in both personal and group settings. Lectures cover a key syllabus over a two-year rolling programme. These are always presented by faculty members and complement the introductory course. There are also morbidity and mortality case conferences with literature reviews presented by trainees and staff. In addition, there are evening journal club meetings and concise morning key-word reports. Well-prepared handouts are expected and the programme is provided mainly by the staff not the residents. Attendance is mandatory and records are kept.

Performance review
Each resident is assessed by all faculty members on a quarterly basis, and is given a report telling them of their strengths and weaknesses by their mentor. A log of all clinical experience is submitted with the department’s annual report to the ABA. Every six months the departmental Clinical Competence Committee inform the ABA in writing of each resident’s progress. This culminates in the granting of a Clinical Competence Certificate upon satisfactory completion of training. The abilities of the consultant staff are assessed regularly by the residents. Poor or good teaching performance weighs heavily in the department’s assessment of staff for promotion or salary rises.

Examinations
Trainees who have completed residency are termed ‘Board eligible’ and may sit the examination of the ABA. If they are successful, they become ‘Board certified’. The examination consists of 350 multiple-choice questions over seven hours and two 30-minute periods of viva voce. Three attempts at the latter over four years is allowed before multiple-choice questions must be retaken. The pass rate is about 70%.

During training, residents are invited to attempt the multiple choice paper each year as a training exercise. These are marked by the ABA and the department informed of the trainees’ national ranking appropriate for their level of training calculated by computer. There is no formal pass mark. The ABA produces a detailed exam and study syllabus.

Advanced anaesthesia training: options

- advanced clinical track: this consists of at least six months exposure to complex clinical cases, with some choice of case mix available to the resident
- subspecialty clinical track: this is a full year spent in three monthly modules such as cardiac, paediatric or obstetric anaesthesia
- clinical scientist track: this is a period of six months clinical or laboratory research supplemented by clinical experience from the advanced or subspecialty clinical tracks. Residents apply for their preferred third year option during year two

Box 2

Performance review

- frequent objective appraisals
- trainees and consultants both assessed
- excellence acknowledged and rewarded
- consultant promotion dependent on residents

Box 3

Supervision of clinical skills

- immediately to hand
- supportive and encouraging
- task well defined pre commencement
- trainee expected to be well prepared
- trainee, not supervisor, performs task

Box 4
In addition, most departments dovetail regular three to six monthly mock-style internal examinations to further prepare candidates. Therefore residents are invited to sit exams four times a year. All exams are viewed as opportunities rather than hurdles and are not barriers to career progress. Residents must also renew their ACLS provider status every two years.

**Research**

Career progression is not dependent on publication, unless an interest in academic anaesthesia is contemplated. However, many residents will have undertaken detailed research and published as medical students. Departments are keen to encourage projects but do not provide protected research time apart from the third year clinical scientist option.

**Working conditions**

Quality of training and working conditions are checked every two years by the ABA. Trainees work about 60–70 hours per week. A typical day starts at 06.00 when they set up their theatre. Residents then present their anaesthetic plans for the day to the entire department at 06.55. Surgery starts at 07.00 lasting until all elective cases in their theatre have finished. The resident then makes pre- and post-operative visits.

On-call duties occur once every four days with a day off after. The weekend is split. Evening shifts designed to relieve day time workers occur in weekly blocks every six weeks. Lunch breaks are ensured by residents allocated to relieve colleagues on a rotational basis.

Residents are permitted three weeks annual leave, plus one week of study leave. Attendance at national conferences by residents is uncommon but some departments do fund a communal hotel room for residents at some major conferences.

Departments meet the cost of membership of learned societies, examination and defence union fees, health insurance policies, and meals whilst in the hospital, but not state licensing fees. Basic texts are paid for and loans for further study materials available. Personalised white coats, oesophageal stethoscopes and business cards are also provided. There is no equivalent body to the Association of Anaesthetists that functions to protect the rights of residents. Therefore on-call rooms tend to be poorly furnished, residents often sharing mixed accommodation.

**Discussion**

One can appreciate that resident training is intense and demanding, requiring physical and mental determination. Trainees gain exposure to difficult cases requiring complex anaesthesia very early on in their training. This creates great pressure on the teaching staff to ensure that the trainee actually performs the procedure required because of the limited duration of residency. The authors found it stressful taking inexperienced residents through difficult tasks at an early stage of the residents training (eg, thoracic epidurals). This is particularly a problem during the introductory period when new trainees begin in two staggered groups of five or ten, usually in July and August. At this time the department has to adapt to receiving many novices when their most senior residents have left. The consultants who supervise the trainees have a particularly busy time, as they must ensure that service requirements are not compromised. No one is allowed annual leave during this difficult period.

Because of the nature of teaching hospital case mix, experience is limited quantitatively with minor cases most affected. Consequently, fully trained residents feel confident when confronted with major cases but are anxious at the prospect of providing anaesthesia for high turnover cases likely to be encountered in private practice. There is also some anxiety over the transition from full supervision with assistance as a resident to complete autonomy as a graduate. There is no training in management or administration.

Invasive monitoring is common in the US, and so residents rapidly gain confidence in these procedures. Most residents would like more experience in thoracic and neonatal anaesthesia, as would their colleagues in the UK. Unlike their British counterparts, many US residents feel they would benefit from anaesthetising for short cases, such as cystoscopies and minor dental cases. Most US residents enjoy a warm and informal relationship with their attending staff. Commitment and ambition are the norm, and a definite ‘family’ departmental atmosphere ensures that the level of morale is usually high. This is in keeping with the American attitude of ‘can-do’, where optimism and
**Comparative career progression**
(NB in UK success in exams is assumed)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>UK</th>
<th>US</th>
<th>'new' UK?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start medical school</td>
<td>18</td>
<td>Start college</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>BSc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Start medical school</td>
<td></td>
</tr>
<tr>
<td>House Officer</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior House Officer</td>
<td>24</td>
<td>ACLS</td>
<td></td>
</tr>
<tr>
<td>FRCA part i</td>
<td>25</td>
<td>Apply for residency</td>
<td>Unified training grade</td>
</tr>
<tr>
<td>FRCA part ii</td>
<td>26</td>
<td>Internship, ACLS</td>
<td>FRCA part i</td>
</tr>
<tr>
<td>Registrar</td>
<td>27</td>
<td>Residency</td>
<td></td>
</tr>
<tr>
<td>FRCA part iii</td>
<td>28</td>
<td>ACLS</td>
<td>FRCA part ii</td>
</tr>
<tr>
<td>Senior Registrar</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Board eligible, start consultancy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Board certified, consultant</td>
<td></td>
</tr>
<tr>
<td>Consultancy</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>