Training and the European Working Time Directive: a 7 year review of paediatric anaesthetic trainee caseload data

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Background. The implementation of the European Working Time Directive (WTD) has reduced the hours worked by trainees in the UK to a maximum of 56 h per week. With a further and final reduction to 48 h per week scheduled for August 2009, there is concern amongst doctors about the impact on training and on patient care. Paediatric anaesthesia is one of the specialist areas of anaesthesia for which the Royal College of Anaesthetists (RCoA) recommends a minimum caseload during the period of advanced training.

Methods. We conducted a retrospective analysis of theatre logbook data from 62 Specialist Registrars (SpRs) who had completed a 12 month period of advanced training in paediatric anaesthesia in our institution between 2000 and 2007.

Results. After the implementation of the WTD 56 h week in 2004, the mean total number of cases performed by SpRs per year decreased from 441 to 336, a 24% reduction. We found a statistically significant reduction across all age groups with the largest reduction in the under 1 month of age group. The post-WTD group did not meet the RCoA recommended total minimum caseload or the minimum number of cases of <1 yr of age.

Conclusions. Since the implementation of the WTD, there has been a significant reduction in the number of cases performed by SpRs in paediatric anaesthesia and they are no longer achieving the RCoA recommended minimum numbers for advanced training.

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In the UK, the maximum number of hours that doctors work per week was reduced by the New Deal in 1991 and more recently by the European Working Time Directive (WTD).

The WTD limits the hours worked to a maximum of 48 h per week and it clearly defines working time and rest periods. Taking into account the need for service provision, a gradual implementation was planned for trainees, so that by August 2004, the average working time did not exceed 58 h per week, decreasing to 56 h per week in August 2007 and 48 h per week by August 2009. In addition, two rulings from the European Court of Justice determined that the whole resident on-call period counts as working time.

In the 2008 edition of the Certificate of Completion of Training (CCT) in anaesthesia, the Royal College of Anaesthetists (RCoA) sets out the competences required for training in paediatric anaesthesia. Although the College recognizes that the programme is competency-based, it recommends a minimum caseload to assess competence. To gain advanced training in paediatric anaesthesia, the RCoA recommends a minimum caseload during a 6 month period of 300 elective and emergency cases, including 100 cases aged 1–5 yr; and 50 cases of <1 yr old, including neonates. The current curriculum does not specify case mix requirements.

We aimed to determine whether the reduction in working hours has been associated with changes in the experience gained by anaesthetic SpRs during their advance training period in paediatric anaesthesia and whether the RCoA minimum caseload requirements are being achieved.
Methods
We carried out a retrospective analysis of logbook data from SpRs in paediatric anaesthesia who had completed a year of advanced training in paediatric anaesthesia in our institution between December 2000 and October 2007. The current rota for our SpRs is a 56 h per week full shift rota with prospective cover. This rota has been in place, since the implementation of the WTD within our Trust in May 2004. From December 2000 until May 2004, the rota was a 60 h per week partial shift system with prospective cover. The number of SpRs in 1 yr posts has changed little during this time period, increasing from 15 to 16 in 2005. At any one time, four of these SpRs are involved in a separate intensive care rota and the numbers on the anaesthetic rota are supplemented by SpRs on a 3 or 6 month training module and, occasionally, an SpR on an honorary contract. The out-of-hours commitment has fluctuated slightly varying from 1:8 to 1:9.

SpRs who completed 12 months of training had their caseload data extracted from the computerized hospital theatre management system. Before 2003, TheatreMan was the system in use; since then, the Trust has been using the Patient Information Management System. These data had been entered into the theatre management system by theatre nursing staff at the time of each procedure. All procedures involving anaesthesia are logged including those from non-surgical interventions such as imaging, interventional radiology, and medical procedures.

The SpRs were divided into two groups. One group who had worked in our Trust before May 2004 and the other group who had worked after May 2004. SpRs who worked less than full time, worked <12 months, or who worked both before and after the WTD implementation were excluded. The data were imported into an Excel template and for each individual anaesthetist, it detailed the total number of cases, the proportion of emergency and elective cases, age, American Society of Anesthesiologists (ASA) grade, and case mix distribution.

During 12 months of advance training in paediatric anaesthesia, the SpRs rotate to the intensive care unit for 3 months. For the purposes of comparing their workload during their 9 months of theatre experience to the RCoA recommended 6 month minimum caseload requirements, the RCoA numbers were extrapolated from 6 to 9 months. Statistical analysis was performed electronically using Student’s t-test. A P-value of <0.05 was considered statistically significant.

Results
Data were collected and analysed for 62 SpRs, 30 who worked before May 2004 (pre-WTD) and 32 who worked after May 2004 (post-WTD). The pre-WTD group worked during the 41 month period between December 2000 and April 2004; the post-WTD group worked during the 41 month period between May 2004 and October 2007.

After the implementation of the WTD, the mean total number of cases performed by SpRs decreased by 24% (P<0.01), from 441 to 336 cases per SpR (Table 1). A reduction was also seen in the mean number of emergency cases (98 vs 63, P<0.01) and the proportion of emergency cases (22% vs 19%, P<0.01). The reduction in the number of cases done by the post-WTD group was found to be statistically significant across all age groups with the largest reduction found in the under 1 month of age group.

The post-WTD group also showed a statistically significant reduction in the numbers of ASA I–III cases (Table 2). There was no difference in the mean numbers of ASA IV and V cases between both groups, although the total number of ASA IV and V cases was very small compared with that seen for ASA I–III cases.

The caseload of the two study groups with the RCoA recommended total caseload was extrapolated for a 9 month period for comparison purposes (Table 3). The...
pre-WTD group was either at or above the recommended minimum caseload in each category. The post-WTD group, however, did not achieve either the recommended minimum total number of cases or number of cases of <1 yr of age. The distribution of cases by surgical specialty for each group is shown in Table 4.

Data from the theatre management systems also showed that between the two 41 month periods, there was an increase of almost 20% in overall theatre activity, increasing from 40 829 to 48 873 cases in the post-WTD time period. The proportion of emergency to elective cases, however, was 18% and 19%, respectively.

**Table 4** Comparison of the subspeciality mean number of cases between the pre-WTD and the post-WTD groups (sd)%

<table>
<thead>
<tr>
<th>Speciality</th>
<th>Pre-2004, mean cases (sd)/%</th>
<th>Post-2004, mean cases (sd)/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td>64 (18)/14.6</td>
<td>43 (13)/12.7</td>
</tr>
<tr>
<td>Dental/maxillo-facial</td>
<td>11 (7)/2.3</td>
<td>8 (6)/2.4</td>
</tr>
<tr>
<td>ENT</td>
<td>43 (21)/9.8</td>
<td>35 (14)/10.5</td>
</tr>
<tr>
<td>General surgery</td>
<td>60 (14)/13.7</td>
<td>50 (11)/14.8</td>
</tr>
<tr>
<td>Haematology–oncology</td>
<td>52 (15)/11.8</td>
<td>42 (17)/12.3</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>35 (10)/7.8</td>
<td>31 (9)/9.3</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>17 (9)/3.8</td>
<td>13 (14)/3.7</td>
</tr>
<tr>
<td>Orthopaedics/spinal</td>
<td>25 (9)/5.7</td>
<td>20 (7)/5.9</td>
</tr>
<tr>
<td>Plastic/cranio/facial</td>
<td>33 (11)/7.4</td>
<td>27 (10)/8</td>
</tr>
<tr>
<td>Radiology</td>
<td>48 (16)/10.8</td>
<td>22 (10)/6.4</td>
</tr>
<tr>
<td>Urology</td>
<td>32 (11)/7.3</td>
<td>27 (9)/8</td>
</tr>
<tr>
<td>Other</td>
<td>21 (10)/4.7</td>
<td>19 (7)/5.6</td>
</tr>
<tr>
<td>Not specified</td>
<td>1 (1)/0.3</td>
<td>1 (1)/0.2</td>
</tr>
</tbody>
</table>

Discussion

Overall, our results show a 24% reduction in the total number of cases done by SpRs during their 12 month period of advanced training in paediatric anaesthesia after the implementation of the WTD 56 h week in 2004. This result is similar to a reduction of 18% and 21% found in two previous studies.6, 7 The only study looking specifically at paediatric anaesthetists showed a reduction of 13% in the number of lists done by SpRs during a 6 month period after the implementation of the 56 h week.8 Surgeons have experienced a similar decrease in the number of cases with recent figures showing that the overall number of operations performed by higher surgical trainees in general surgery decreased by 15.5% after the implementation of the WTD.9

In our study, the reduction in case numbers was seen in all age groups and in severity of pre-existing illness. Interestingly, the absolute numbers of ASA III and IV cases in both groups are very similar, implying that the post-WTD group did a higher proportion of ‘sicker’ cases during their period of advanced training.

There was a statistically significant reduction in the proportion of emergency cases done by the post-WTD group. This may be explained by the fact that although the reduction in hours in the post-WTD group has been mainly at the expense of daytime working, there has been an increase in the use of daytime emergency lists in our institution to limit out-of-hours operating in line with the recommendations of the National Confidential Enquiry into Patient Outcome and Death (NCEPOD).10

From our data, trainees are not achieving all of the minimum caseload targets recommended by the RCoA. The post-WTD group did not meet the target for total number of cases (336 vs 450 in 9 months) or cases of <1 yr of age (57 vs 75 in 9 months). In 2005, the recommended minimum caseload for 6 months training in paediatric anaesthesia was reduced from 500 in 6 months to the current 300.11 In August 2008, a revised edition of the CCT in Anaesthesia was published by the RCoA and the recommended caseload has remained constant.5 The Association of Paediatric Anaesthetists used to recommend a figure of 400 cases per 6 months, but no longer offers such guidance.12

The subspeciality distribution of cases between the pre- and the post-WTD groups was similar and it would appear from these results that it is not a major factor in explaining the difference in the total number of cases between the two groups.

Although we have demonstrated a reduction in the number of cases done by anaesthetic SpRs as a result of the reduction in working hours, we have no direct evidence that this has any impact on training or patient care. A recent study looked at the ability of anaesthetists to treat children for emergency surgery. Of those anaesthetists who completed their training before 1997, before structured training programmes, more than 80% were comfortable to anaesthetize children <6 months of age at the end of their training. For those anaesthetists who completed their training between 2003 and 2007, thus affected by the WTD and the New Deal, this figure had decreased to <40%.13

The WTD aims to protect workers from working excessive hours, reduce risks caused by tired workers, and improve their quality of life. Views on whether these aims have been achieved remain mixed. Although some support the changes and report the benefits, others feel that the switch to full shift rotas has had a detrimental effect on their quality of life by increasing shift work, the number of weekends spent at work, and the time spent travelling.14 15 The negative effects of shift work on health are well documented and increase with age.16 There is some evidence on ways to minimize the adverse effects and the RCoA has made recommendations for the design of compliant rotas that optimize and protect the training of junior anaesthetists while aiming to reduce the risks of shift work.17 18

Concern, however, remains about the potential negative effect the WTD has had on training.14 15 19 20 Many specialities, at all levels, have expressed their disquiet on this subject, but, as previously stated, there is no evidence
to either uphold or refute the claims. Recent rulings by the European Parliament may also have closed the door on potential solutions. In December 2008, they rejected a proposal to count only the hours of actual work rather than the whole resident on-call period as working time and voted in favour of phasing out an individual’s doctors choice to opt out for the 48 h a week limit.21 The Royal College of Surgeons have fears for the adequacy of surgical training programmes and patient safety with the reduction in hours resulting from the WTD and continue to campaign for the introduction of a specialty opt-out for all the surgical specialties in England, to allow hours to be worked up to the figure defined by trainee organizations.22

In recent years, as hours and training time have decreased, the ethos of medical training has changed and we have moved away from a system of ‘time-based’ training to the one based on competency. Great strides have been made within anaesthesia, like other specialities, to provide the basis for competency-based training with the development of a structured curriculum and the introduction of workplace-based assessments. In an hour-limited attachment, the reliance upon trainees for service undoubtedly has an effect on training. To prevent the potentially negative effect of the WTD, it has been suggested that training duration be lengthened. However, this may not be practical with the run-through systems that are now in place.

Our results demonstrate that, in our institution, decreasing the hours worked by trainees has decreased their clinical experience. With a further reduction in hours planned for 2009, with the next phase of introduction of the WTD, the impact on clinical experience is likely to increase. The goal of training competent doctors and maintaining the quality of patient care, however, must remain paramount. When designing specialist training schemes, we must ensure that the balance between competency and adequate clinical exposure is maintained. Further research is urgently required to identify exactly where this balance lies.

References
3 Judgment of 3 October 2000: Case C-303/98 Sindicato de Medicos de Asistencia Publica (SiMAP) v Conselleria de Sanidad y Consumo de la Generalidad Valenciana. European Court Reports 2000; 1: 7963
4 Judgment of 9 September 2003: Case C-151/02. Off J Eur Union 2003; C 264/24
5 The CCT in Anaesthetics IV: Competency Based Higher and Advanced Level (Specialty Training (ST) Years 5, 6 & 7), Training and Assessment, A Manual for Trainees and Trainers. London: The Royal College of Anaesthetists, August 2008; Available from http://www.rcoa.ac.uk/docs/CCCTptiv.pdf
13 Carr A. Competence. APA Annual Scientific Meeting, May 2008