

# Senior house officers' work activities in an accident and emergency department

K. Y. THAM, P. W. RICHMOND & R. J. EVANS

Accident and Emergency Department, Cardiff Royal Infirmary, Newport Road, Cardiff CF2 1SZ, UK

## SUMMARY

A study of senior house officers' daytime work activities was conducted in the accident and emergency department of the Cardiff Royal Infirmary. Activities were timed every 15 seconds by a single observer and were subdivided into working periods, meal periods and periods when no patient was waiting to be seen. A total of 96.1 h was analysed. The SHOs were found to be working for 78% of their time, of which 18.5% was taken up by non-doctor tasks. The SHOs took an average of 10.4 min for each walking wounded patient, 10.6 min for each paediatric patient and 27.3 min for a trolley patient. Each patient required an average of 14.2 min for assessment and treatment, which meant that 3.3 patients were seen each hour. However, considering that SHOs worked for 78% of their time, the actual rate of work was 4.2 patients for each working hour. The implications for staffing are discussed.

**Key words:** daytime work activities, senior house officers, staffing levels

## INTRODUCTION

The accident & emergency (A&E) department of the Cardiff Royal Infirmary is a large department with over 75 000 new attendances each year. The department has a separate paediatric area that treats over 20 000 new attendances each year. The department is staffed by two consultants, two senior registrars, one staff grade and 12 senior house officers (SHOs). The SHOs work a 40-h week. There are four work areas within the department: a two-bedded resuscitation room; a nine-bedded trolley area; a five-roomed walking wounded area; and a four-roomed paediatric area. There is an operational nurse triage system that comprises 25 nurses. The nurses also have extended roles and many are able to suture lacerations on the scalp, arms and legs (excluding hands). A nurse practitioner scheme operates within the department

which comprises five nurses who treat and discharge 1.5% of the new patient workload.

The study investigated the SHOs' daytime activities, both clinical and non-clinical, and quantified these activities through the working day.

## METHODS AND SUBJECTS

From the departmental computer database, the mean number of patients seen by each SHO within the previous four months was determined. The four SHOs whose numbers of new patients seen were nearest the mean were selected for the study. The SHOs in the study saw a total of 9358 new patients during their six-month attachment, during which they worked a 40 hour week (i.e. standard SHO equivalent); if extrapolated, this equates to 4679 new patient attendances for each SHO each year. This compares with the British Association for Accident and Emergency Medicines' standard SHO equivalent of one doctor for each 4000 new patient attendances.

Initially a pilot study was conducted on three consecutive mornings from 0900 to 1300 h, during which a SHO was observed. The observer (K.Y.T.) timed and recorded the various activities, to the nearest 15 s, with a stopwatch. Fourteen activities were identified (Table 1).

During the main study a total of 96.1 h was observed and recorded. A total of 47.8 h was weekday duty and 48.3 h weekend duty. The SHOs were studied from 0900 to 1600 h for morning duty and from 1600 to 0100 h for evening duty. The study was carried out over a four-week period from December 1993 to January 1994 when the SHOs had been in post for approximately five months of their six-month rotation.

During the study, the SHOs moved freely among the various areas within the department. Each SHO was encouraged to ignore the observer as much as possible. When they needed advice about patient management, they were encouraged to look for another senior member of the department. The use of a single observer eliminated the problem

Correspondence:  
**Rupert Jon Evans**,  
Senior Registrar in  
Accident and  
Emergency  
Medicine, Cardiff  
Royal Infirmary,  
Newport Road,  
Cardiff CF2 1SZ, UK

**Table 1.** Clinical activities of accident and emergency senior house officers

<p>Doctor's tasks</p> <p>Patient contact — history taking, physical examination, reviewing results of investigations, discussion with patients and relatives</p> <p>Writing notes</p> <p>Practical procedures — suturing, manipulation of fractures, reduction of dislocations and removal of foreign bodies</p> <p>Referral — to other doctors and telephone consultations</p> <p>Advising — colleagues, seeking advice, instructing nurses</p> <p>Irreplaceable miscellaneous — washing hands, consulting drug formulary and handbooks, speaking to radiographers, moving between work areas, <i>ad hoc</i> bedside or radiology teaching</p> <p>Non-doctor's tasks</p> <p>Filling in request forms — for radiological or blood investigations, physiotherapy referrals, fracture clinic appointment</p> <p>Waiting on the telephone — for operators or other doctors, ringing laboratory or porter service</p> <p>Venepuncture and intravenous treatment</p> <p>Replaceable miscellaneous — looking for patient in waiting area, waiting for patient to come into the cubicle, pushing patient in wheelchair, waiting for empty cubicle to examine patient, removing dressings, searching for misplaced notes and radiographs, looking for equipment (peak flow meter, auroscope ear piece)</p> <p>Breaks and meals</p> <p>No new patient in the department</p>
--

of inter-observer variation. The observer had worked as an A&E SHO for a year and she was familiar with the unique work environment and varied clinical activities within it.

## RESULTS

### Hours of work

A total of 96.1 h was analysed. The SHOs spent 74.9 h (77.9%) working, 5.4 h (5.6 %) of their time having breaks and meals and the remaining 15.8 (16.4%) were spent waiting in the department as no patient was waiting to be seen. Table 2 shows the mean proportion of working and non-working times. There was little difference in the amount of time spent working when comparing weekend and weekday duties and morning and evening duties.

Of the 15.8 h when there was no new patient in the department, 7.6 h (48.1%) were between 0900 and 1100 h and 2200 and 0100 h. The SHOs tended to take their breaks during that time when the department was quiet and hence only 5.7%

of the time was actually recorded as breaks and meals.

### Area and rate of work

Three hundred and sixteen patients were seen during the study and the patient mix is categorized as follows: 180 (57.0%) were walking wounded patients; 68 (21.5%) were trolley patients; 67 (21.2%) were paediatric patients and one (0.3%) required resuscitation. Table 3 shows the distribution of working time among the different work areas.

Each patient required an average of 14.2 min for assessment and treatment, which meant that 3.3 patients were seen each hour. However, considering that 74.9 h were the actual number of hours worked, the rate of work was 4.2 patients for each working hour.

### Range of activities

Table 4 shows the mean proportions of working time spent on various clinical activities. Of the

**Table 2.** Mean number (percentage) of working and non-working times (hours)

	Morning duty		Evening duty		Average (%)
	Weekday (n=21.9 h)	Weekend (n=21.2 h)	Weekday (n=25.9 h)	Weekend (n=27.1 h)	
Working	17.5 (79.9)	15.7 (74.1)	21.1 (81.5)	20.6 (76.0)	77.9
No patient	3.3 (15.1)	4.1 (19.3)	3.6 (13.9)	4.8 (17.7)	16.5
Breaks and meals	1.1 (5.0)	1.4 (6.6)	1.2 (4.6)	1.7 (6.3)	5.6

	Resuscitation room (n=1)	Trolley area (n=68)	Walking wounded (n=180)	Paediatric (n=67)
Total time (h)	0.9	30.9	31.1	11.9
Time spent with each patient (min)	4	27.3	10.4	10.7

**Table 3.** Distribution of working time among work areas

doctor's tasks, the amount of time spent on patient contact (39.7%) was the largest, with the time taken to write clinical notes (18.7%) next. There was again little difference in the proportion of time spent on these activities between weekday and weekend duties and between morning and evening duties.

## DISCUSSION

The study reveals that SHOs in an A&E department are working for a considerable proportion of their daytime shift (77.9%) and that most of this time is spent on doctor's tasks (81.5%). The SHOs activities examined did not include any night-time periods, i.e. 0100–0900 h. However, it was surprising that in a large A&E department, for 16.4% of their time they had no patient to attend to. It was of interest to note that almost half of this time was at the beginning of the morning shift and at the end of the evening shift.

Previous studies in the UK have looked at the workload and work patterns of junior doctors on

medical and surgical wards. A study of pre-registration medical house officers showed that the hours of duty ranged from 83 to 101 h each week and that between 50 and 71% of house officers' time was spent on patient-orientated duties during the day, but this fell to between 21 and 53% at night.<sup>1</sup> Another study revealed that SHOs and pre-registration house officers spent nearly half of all their on-call duty time working, but less than half of that time was spent in direct contact with patients. This study concluded that the workload while on duty was excessive and that changes in some administrative procedures and the employment of non-medical staff might reduce the time spent on non-clinical activities, thereby reducing the overall workload and allowing more time for patient contact.<sup>2</sup> One common theme in these studies was the identification of tasks that were time consuming, but contribute little to the doctors' training. In our study, these have been described as non-doctor tasks and occupied 18.5% of their working time.

**Table 4.** Mean proportion of working time spent on various clinical activities

Activity	Morning duty		Evening duty		Average
	Weekday	Weekend	Weekday	Weekend	
<b>Doctors tasks</b>					
Patient contact	34.7	47.6	36.7	41	39.7
Writing notes	16.6	23.1	17.2	18.8	18.7
Practical procedures	7.1	0.4	2.6	3.3	3.4
Referrals and telephone consultations	2.4	3.4	4.6	7.8	4.7
Seeking/giving advice, instructing nurses	6.3	2.8	4	5.3	4.6
Irreplaceable miscellaneous	13.4	9.5	11.5	7.3	10.4
Subtotal	80.4	86.6	76.6	83.5	81.5
<b>Non-doctor's tasks</b>					
Filling in forms	4.8	3.8	4.1	3.4	4
Waiting on telephone	2.3	1.1	4.3	2.3	2.6
Venepuncture and intravenous treatment	2.9	0.6	3.4	3.4	2.7
Replaceable miscellaneous	9.6	7.7	11.7	7.3	9.1
Subtotal	19.5	13.2	23.6	16.5	18.5

There are ways to relieve the SHOs of such tasks. We question the need for A&E SHOs to undertake some of these duties. This is especially so for 'routine' haematological and biochemistry blood investigations. If the A&E SHOs limit themselves strictly to blood investigations that would influence their management (e.g. BM stix, plasma paracetamol level and arterial blood gases), the number of venepunctures and forms to be filled in would be reduced. Alternatively, the employment of non-medical staff, e.g. a phlebotomist to relieve the doctor of such tasks, is worthy of consideration. Another possibility that could be explored is the employment of a doctor's assistant, who could relieve the SHO of their clerical, administrative duties and some of the miscellaneous activities, e.g. bringing a patient into a cubicle, removing dressings or fetching equipment. The nursing staff in A&E departments are continually extending their role and again this will aid the doctor's workload. Finally, simple modifications within the department and better house-keeping will help to further reduce some of the replaceable miscellaneous activities.

The SHOs adopted a positive attitude towards the study and when the results were presented to them a number of constructive suggestions on improvements within the department were made. Some of these suggestions have since been implemented. These included the introduction of better sign-posting to areas within the department, such as the fracture clinic and radiography department, which now helps to eliminate the need for repeated directions from the doctors to their parents.

A prospective time study of emergency doctor workload in Connecticut, USA revealed that the doctors' service time for non-selected service patients was 24.2 min for each patient. However, the study showed that this time varied significantly from the standard walk-in (9.8 min for each patient), observation (55.6 min for each patient) and critical care patient (31.9 min for each patient).<sup>3</sup> Our findings showed that the time for walking wounded patients, both adults (10.4 min for each patient) and children (10.6 min for each patient), was similar to that of the standard walk-in patients (9.8 min for each patient) in the Connecticut time study. The Cardiff Royal Infirmary's paediatric A&E department treats mainly minor injuries as the seriously ill or injured children are seen in the trolley or resuscitation areas. This probably accounts for the finding that the time needed to assess and treat

each child is similar to that for an adult walking wounded patient.

The trolley patients took on average 27.3 min for each patient, which compares with the Connecticut studies critical care patient time of 31.9 min. Our study only included one resuscitation patient and thus is not able to make any meaningful estimation of the average time taken for assessment and treatment.

The conclusion of the Connecticut study was that the case mix of patient services affected the emergency doctors' workload and should be considered in planning departmental staffing needs.<sup>3</sup> We would endorse this viewpoint.

Another way of estimating the required staffing level that has been suggested in the UK is by the use of activity-related groups.<sup>4</sup> These are categories of patient as defined by severity of illness and average time spent with them.

Activity-related groups have been used at Barnet General Hospital and it was admitted that the time assigned to a group needed further validation, but that it was difficult to measure this accurately.<sup>4</sup> The findings from our time study could provide a means of estimating staffing requirements within our department based on patients by their allocation to a specific area. However, to be confident of its validity we suggest that this should include observation of more SHOs and over their 6-month period in post.

## ACKNOWLEDGEMENTS

We thank Dr J.C. Evans, Dr R.O.N. Evans, Dr E.J. Rubython and Dr R.S. Williams for their participation in the study.

## REFERENCES

1. Leslie P.J., Williams J.A., McKenna C., Smith G. & Heading R.C. (1993) Hours, volume, and type of work of preregistration house officers. *British Medical Journal* **300**, 1038-1041.
2. Turnbull N.B., Miles N.A. & Gallen I.W. (1993) Junior doctors' on call activities: differences in workload and work patterns among grades. *British Medical Journal* **301**, 1191-1192.
3. Graff L.G., Wolf S., Dinwoodie R., Buono D. & Mucci D. (1993) Emergency physician workload: a time study. *Annals of Emergency Medicine* **22**, 1156-1163.
4. Crone P.W. & Whitlock M.R. (1993) The role of activity-related groups in assessing workload in the accident and emergency department. *Archives of Emergency Medicine* **10**, 212-215.