AUDIT

Surgical trainees benefit from good consultant working practices: an audit on the effect on training of a new consultant rota

A R I Majed, A A Riaz, P Das-Purkayastha, W Martin, S J Gregg-Smith

Postgrad Med J 2006;**82**:542–544. doi: 10.1136/pgmj.2006.047241

Purpose: To retrospectively assess operative supervision for orthopaedic trainees over an 18 week period when trauma and orthopaedic consultants changed their on call working practice from one week on call to a four day/three day block, during a fortnight period.

Outcome: The rota changes had important implications on workload and consultant availability to supervise juniors during operation with a positive effect upon training such that trauma surgery supervision rates increased significantly ($p < 0.001$) after the introduction of these new working arrangements. Working life for consultants and ultimately patient care were also felt to improve and consultants' working hours were closer to the European working hours directives.

At present surgical training is at crossroads with recent implementation of the European Working Time Directive (EWTd), the Calman Training scheme, and now modernising medical careers (MMC) (that is, a shorter working week for fewer years) on the one hand and the preservation of the highest British standards in surgical training on the other. Thus new challenges are emerging because of a shorter length of training with fewer opportunities for hands on experience. These changes have affected training and supervision of junior doctors.¹

Before our audit, nine orthopaedic consultants each had been on call for one week at a time where there had been delays in operating (because of routine commitments), disruption to outpatient clinics, and large numbers of patients admitted. This led to unpredictability of the workload and consultants were finding it difficult to be present for both trauma and their elective commitments. At that time juniors felt that they were not having a high enough level of supervision. This led to the whole structure of the on call trauma take to be rearranged. Driven by the forthcoming European directive to limit working hours, the consultants elected to change their traditional working practice upon the above stated "4:3" split—that is, a continuous four day on call commitment in week one and a three day on call commitment in week two.

The new rota has meant that consultants are now either on call from Friday to Monday with "respite leave" until the following Thursday, or from Monday to Thursday with "respite leave" until the following Monday. New to the system is that while on call, the consultants have a commitment to perform or supervise all trauma cases each weekday until 5 pm, and to be present in the theatre suite at weekends to supervise all juniors on call.

During the on call and "respite" periods, all routine clinics and operating lists were cancelled for the on call firm. This

was intended to allow time the on call consultant extra time for the management of trauma patients, and for operative supervision of junior staff.

The aim of this study was to assess the effect of the new 4:3 rota on the working practice of consultants and further the impact on supervision of junior staff operating on trauma patients. Additionally, the study aimed to evaluate consultant involvement in the management of complex trauma surgery after implementation of the new rota.

METHODS

The study period was 18 weeks in duration, one week for each of the nine consultants immediately before and immediately after the change in rota (the second "week" occurring in two parts because of the 4:3 split).

Handwritten records of all the emergency admissions were used to identify patients undergoing trauma operations during the study period. These records were meticulously kept by the senior nurse on duty in the unit as part of routine practice, and were not specifically designed for the study. This comprehensive list made available a daily record of patients waiting for surgery. These records were cross referenced with the trauma theatre logbook, and with the logbooks of the six other theatres less often used for trauma cases. This ensured full inclusion in the analysis of patients operated on by trauma surgeons, but admitted under "shared care" or other specialties.

The medical notes were used to determine the procedure performed, the operating surgeon, and the assistants (if any). Cross checking notes with operating theatre log books found that often the most senior surgeon present was recorded as the lead surgeon although they may have just been supervising. As a result of this the theatre logbook was deemed inaccurate as a primary source of information for missing notes. Therefore any notes not located after three separate attempts were excluded from the analysis.

For each operation the level of lead surgeon and their assistant was noted. A simple three level system was used (SHO = 1, registrar = 2, consultant = 3). From this it could be easily seen if a consultant was present with the operation and whether they were performing the operation or supervising. Any operations performed by non-consultant career grade doctors (staff grades and associate specialists) were excluded from this study. The same set of registrars was present for the entire duration of the study.

Operations were also coded 1–3 (basic procedures that could be performed by a minimally trained surgeon = 1, most operative fracture management = 2, complex fracture management which should involve a consultant = 3).

Data were recorded on Microsoft Excel spreadsheets, and SPSS software was used for analysis. The Pearson χ^2 test was used to analyse the data in this investigation.

Table 1 Supervision rates for all trauma operations

	Before	After
No consultant	127 (50.7%)	50 (21.5%)
Consultant assisting	9 (4.3%)	96 (41.2%)
Consultant operating	76 (35.8%)	87 (37.3%)
Total	212	233

RESULTS

A total of 746 patients were admitted that required operative treatment during our study time. Of these 696 (93.3%) operative notes were identified and analysed and 50 operative notes were missing (6.7%). From these 445 (64%) operations met the inclusion criteria for this study.

Table 1 shows consultant presence for all categories of operations.

From this it can be seen that the number of operations performed without a consultant present reduced from 50.7% for the full week rota to 21.5% for the split week. There was a large increase in the number of operations that were assisted by a consultant 4.3% to 41.2% of all operations performed. These represent a highly significant improvement in supervision rates overall ($p < 0.001$) after the change in rota. It can also be seen that there is no significant change in the number of operations being actually performed by consultants.

Table 2 displays the amount of consultant supervision for each grade of operation. The actual number of grade 1 operations being performed without a consultant present had reduced from 76.1% to 61.3% during the study period while the number of supervised operations increased from 4.3% to 8.5%. This change however was not deemed as significant ($p < 0.4$). The number of grade 1 operations performed by consultants had not significantly changed.

Grade 2 operations had a reduction from 55.2% to 17.4% in the number of operations performed without a consultant and an increase from 3.6% to 50% in the number of consultant supervised operations. The overall supervision rate in this category had improved significantly ($p < 0.001$). Complex operations performed by consultants (grade 3) had not changed significantly with the change in the rota ($p < 0.68$).

DISCUSSION

From this study one can clearly conclude that a change in the working practices of consultant orthopaedic surgeons has had an extremely positive impact not only on the training and supervision of junior surgeons but also on the management of difficult trauma cases. The change in our working practice has meant a significant increase in consultant supervision of juniors. From the patient's point of view this

change in working practice has resulted in increased supervision of their trauma care.

Operations that can be performed by trainees with minimal supervision (grade 1) are still being undertaken, however more complex operations (grade 2) are much more supervised by consultants constituting good clinical practice and training. Furthermore, this study does highlight that although positive training steps are being undertaken in terms of training there is still needs to be improvement. Unfortunately, this study highlights that there has not been significant change in the number of complex operations (grade 3) performed by the consultants. This should be our next main goal.

We feel that in the present climate, for trainees to get the required exposure of complex cases fundamental changes not only to "on call rotas" but training in general needs to take place. A recent study regarding Australian colorectal trainees found that outcomes after resection for colorectal cancer did not differ between the consultant and trainees in the context of a closely supervised training programme, even though the trainee was operating on higher risk patients with more advanced disease.² More supporting evidence from colorectal and upper gastrointestinal units in the UK have suggested that properly supervised trainees can resect a high proportion of colorectal cancers and major upper gastrointestinal resection without compromising immediate outcome or long term survival and furthermore, early clinical outcome of patients undergoing surgery by supervised trainees is no worse than in those operated on by consultants.^{3,4}

As consultants in the 4:3 split week rota have no elective commitments, they are also able to be more involved in the preoperative assessment, consent process, and the post-operative care of their trauma patients than previously. This increase in consultant availability for ward based activities provides further training and support for junior staff, which has not always present previously. Indeed, although not formally assessed the participation of senior staff in radiography and trauma meetings also significantly improved with the new working systems (data not published). Furthermore, with the new rota, consultants in general reported to feeling less stressed, more refreshed, and noticed a reduction in the disruption to other clinical commitments such as outpatient clinics (unpublished data).

From the trainee's point of view, coping with a full working week while caring for the previous week's trauma admissions was arduous. A full week of trauma on call followed by eight weeks without any further trauma resulted in large fluctuations of the workload. It has now become much easier to efficiently manage a more constant number of patients after the introduction of the new scheme. The absence of the consultant during their respite period has not proved problematic. The consultants have introduced a

Table 2 Supervision rates for different grades of trauma operations

Grade of operation		Before	After
1	No consultant	35 (76.1%)	19 (61.3%)
	Consultant assisting	3 (6.5%)	4 (12.9%)
	Consultant operating	8 (11.6%)	8 (17%)
	Total	46	31
2	No consultant	91 (55.2%)	31 (17.4%)
	Consultant assisting	6 (3.6%)	89* (34.5%)
	Consultant operating	68 (41.2%)	58 (32.5%)
	Total	165	178
3	No consultant	1 (9.1%)	0 (0%)
	Consultant assisting	0 (0%)	3 (0.9%)
	Consultant operating	10 (90.9%)	21 (87.5%)
	Total	11	24

thorough handover system, and their predecessor makes the next consultant on call aware of patients with problems or pending surgery.

The culture among consultants and trainees has changed. It is now unacceptable for a trainee to be left to cope with a case or problem beyond their ability.⁵ Trainees under the old system felt there was less support during a problem, as it was sometimes difficult to locate consultants during busy "take" periods. As consultants are now expected to attending theatres every day of the week, it is much easier to seek advice if necessary.

A recent study has shown that 37% of junior staff had no operations supervised by a consultant.⁶ The authors concluded that many hospitals fall short of the accepted guidelines on basic surgical training. We feel that the recent changes in our department have significantly improved the foundations of our surgical training, although further attention to training is required.

Authors' affiliations

A R I Majed, A A Riaz, P Das-Purkayastha, W Martin, S J Gregg-Smith,
Department of Trauma and Orthopaedic Surgery, Royal United Hospital,
Bath, UK

Funding: none.

Conflicts of interest: none.

ARIM and AAR contributed equally to the study.

Correspondence to: Mr A Majed, 88 Willow Vale, London W12 0PB, UK; a.majed@doctors.org.uk

Submitted 28 February 2006

Accepted 27 March 2006

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