2 FACILITIES

Recommendations

Ensure that Strategic Health Authorities, together with NHS Trusts, collaborate to guarantee that all emergency patients have prompt access to theatres, critical care facilities, and appropriately trained staff, 24 hours per day every day of the year.

Ensure that all operating theatres have sufficient numbers of trained recovery staff available whenever those theatres are in use.

Provide regular resuscitation training for all clinical staff, which is in line with Resuscitation Council guidelines.

Ensure that all recovery bays have both a pulse oximeter and ECG monitor available. This applies whether patients are having local or general anaesthetic or sedation. The equipment used in recovery areas should be universally interchangeable and able to provide a printable record.

Nominate an arbitrator, who would decide the relative priority of theatre cases in order to avoid queuing for theatre spaces.

Ensure that systematic clinical audit includes the pattern of work in operating theatres.

INTRODUCTION

Each participating hospital was sent a general data questionnaire, which asked for details about the size of the hospital and about the facilities available in the theatre and recovery suite. This chapter explores the relationship between the size and surgical capacity of the hospital, and its ability to deliver an appropriate, timely surgical service.

TYPE OF HOSPITAL AND SIZE

The DoH classifies NHS Trusts into 5 main "cluster" groups: acute, multi-service, mental health with community, teaching and specialist. These groups are further sub-divided based upon size and expenditure, with allowance being made for London weighting [4].

Trusts may however be configured in an almost infinite number of ways, and may consist of one large hospital or many small hospitals of different types.

By way of example, Table 2.1 indicates the number of hospitals within the cluster types in this study, and the range of numbers of theatres, as reported to NCEPOD, in the hospitals within the Trust cluster types.

Table 2.1 Number of operating theatres within DoH "cluster" types and range of operating theatres within these hospitals

Cluster group	Hospitals	Theatres		
		Min	Max	Average
Acute specialist	14	1	9	5.0
Acute teaching London	22	1	20	8.5
Acute teaching outside London	52	1	30	8.8
Children's services	4	7	9	8.0
Large acute London	13	1	9	5.2
Large acute outside London	115	1	15	6.7
Large multi-service	18	1	11	5.4
Medium acute London	14	2	16	7.6
Medium acute outside London	78	1	16	8.7
Medium multi-service	28	1	13	6.6
Orthopaedic	4	6	7	6.5
Small acute London	3	7	7	7.0
Small acute outside London	28	1	13	7.8
Small multi-service	14	4	8	6.4

When comparing the ability of hospitals to deliver surgical services, the DoH classification of Trusts has little merit. For example, in a typical city with a population of 300,000, services may be provided by a single site hospital and single Trust, or by several different hospitals at different sites, each providing a different range of specialties, managed by a single or separate Trusts. The DoH classification gives no indication about how acute services are configured.

By contrast, the number of theatres available in a hospital correlates reasonably well with the number of surgical beds (Tables 2.2 and 2.3), and the number of surgical specialties within that hospital (Table 2.4). The number of operating theatres within a hospital is therefore a better surrogate marker of the surgical capacity of the hospital.

Table 2.2 Number of operating theatres in NHS hospitals by number of surgical beds *(Numbers of hospitals are indicated by the figure within the shaded boxes)*

Surgical theatres	0	<50	50-100	100-150	150-200	200-250	250-300	300+
30								1
25								1
23								1
22								1
21						1		
20					1			1
19							1	1
18								2
17						1		3
16				1	1	1		2
15						2	1	2
14				1			2	3
13				1		3	2	3
12				1	2	5	2	3
11				1	5		1	
10				2	8	5	1	1
9			2	2	7	5	1	
8			3	6	14	7		
7			3	13	7	1	2	
6		1	2	13	3			
5		2	5	5		1		
4		8	10	10	1			
3	4	12	8					
2	2	21	3					
1	6	15						

Surgical beds

Table 2.3 Number of operating theatres in independent hospitals by number of surgical beds

Surgical theatres	<50	50-100	100-150	150-200
13	1			
11				1
6				1
5		3	3	
4		10		
3	10	22		
2	30	6		
1	9	1		

Surgical beds

In the independent sector, the majority of hospitals have less than 100 beds and up to four operating theatres. Unscheduled activity forms a very small percentage (1.4%) of the workload in this sector.

Table 2.4 Number of operating theatres by number of surgical specialties in NHS hospitals

Number of surgical theatres	1	2	3	4	5	6	7	8	9	10	11	12	13
30										1			
25											1		
23										1			
22										1			
21											1		
20									1	1			
19									1		1		
18								1	1	1			
17								1	1	1			1
16							1		1	2		1	
15								1	1	2	1		
14							1	2	1	1		1	
13						1		1	4	2	1		
12							1	3	4	2	1	2	
11							1	2	1	2	1		
10						1	4	4	6	3			
9		1				1	2	4	7	1	2		
8					1	4	8	8	3	6			
7			1	1	3	7	4	6	2	2			
6		3	1	1	1	3	2	3	4	1			
5	1	1	1	1	1	3	1	3					
4	2	2	3	5	6	6	3	3	1				
3	4	4	1	6	3	4	2	1					
2	2	9	4	7	1	2							
1	5	4	2	5	1		1						

Number of surgical specialties

Although a general relationship appears to emerge between the number of theatres and the number of emergency admissions, as reported to NCEPOD, this relationship is much weaker. Whilst in general the more emergency admissions a hospital receives, the more theatres it has, there are some striking variations. One hospital, for example, has 23 theatres, but receives less than 5,000 emergency admissions, whereas hospitals which receive greater than 25,000 emergency admissions, have a range of operating theatres from seven to 30. This may simply reflect the fact that the >25,000 emergency admission grouping is too broad to identify a relationship between much larger numbers of admissions and numbers of theatres. It should also be pointed out that the figure for emergency admissions includes all non-surgical admissions. However, it may be that some hospitals have too few operating theatres to cope efficiently with their emergency workload.

Table 2.5 Number of operating theatres in hospitals by number of emergency admissions

Surgical theatres	<5000	5000-10000	10000-15000	15000-20000	20000-25000	25000+
30						1
25						1
23	1					
22		1				
21						1
20					1	1
19				1		
18					1	2
17		1			2	1
16				1	2	2
15	1	2			1	1
14		1	1			4
13	1	2		2	1	4
12		2	1		5	4
11	2	3		1		2
10		8	1	5	1	1
9	2	2	2	4	4	2
8	3	6	3	7	6	5
7	12	4	4	2	2	2
6	6	6	2	5		1
5	13	2	2			
4	24	6	2	2		
3	42	4	1			
2	50	1	1	1		
1	27		1			

Emergency admissions

In WOW I it was noted that the proportion of operations which needed to be performed at night in an emergency theatre between Monday to Friday, was 0.5% of the total theatre workload. Taking as an arbitrary starting point the premise that to justify availability of an emergency theatre, one emergency (on average) should be performed each night, this would mean that a minimum of 200 cases should be performed each weekday.

It has already been noted that the optimum catchment population for an acute hospital is believed to be 450,000 to 500,000 [5,6]. The ever-increasing pressure on working hours, so far affecting trainees, will also soon begin to have impact upon consultants.

EFFECT OF HOSPITAL SIZE ON TRAUMA AND EMERGENCY SERVICE

Planned trauma and emergency sessions

NCEPOD has recommended that all acute hospitals should have sufficient staffed emergency and trauma operating sessions, with appropriately trained staff, to permit patients to be operated upon in the timeliest manner [7].

In the 1998 consultation document "Provision of Acute General Hospital Services" issued jointly by the British Medical Association, the Royal College of Surgeons of England, and the Royal College of Physicians of London [5], it was recommended that the ideal hospital should be of sufficient size to provide for a catchment population of 450,000 to 500,000. This consultation document set out several principles, which should govern the configuration of hospital services including the following:

- High quality clinical care, which is timely
- Consistently available sustainable specialist services
- Availability of up-to-date technology equipment and critical care facilities
- 24 hour pathology and diagnostic imaging services
- Optimum training opportunities
- Co-operation between hospitals to give optimum outcomes for specialist or complex conditions.

The ability of a hospital to meet the requirements of a timely emergency service is dependent upon their having sufficient operating theatres. Tables 2.6 and 2.7 compare the number of trauma and emergency lists per week with the number of operating theatres in NHS hospitals.

There is little relationship between the number of dedicated trauma or emergency operating lists, and the number of operating theatres. This is perhaps surprising. It might be expected that those hospitals with a large number of operating theatres would be more likely, by virtue of economies of scale, to provide emergency and trauma sessions every day of the week including weekends. The majority of hospitals have access to trauma lists for five or seven sessions per week with a smaller number having

Table 2.6 Number of operating theatres by number of trauma sessions per week

Surgical theatres	0	2	3	4	5	6	7	8	9	10	11	12	14	16	18	19	20	21	27	28
30														1						
25										1										
23									1											
22																	1			
21					1															
20									1	1										
19										1										
18					1					1									1	
17					1					2			1							
16							2			1			1							
15						1		1	1		2									
14							3		1			1								
13					2	2	2	1	1			1								
12				1	3	2	2			3								1		
11						2	2			2										
10					6	3	3			1		1	1							
9			1		7	3	1	1												
8			2	1	12	1	5		2	1	1	3								
7		1	1	2	10	1	3			1					1	1				
6			2		7	1		1												
5		1	1		1	1														1
4		2	1	4	2															
3	1				2															

Trauma sessions

Table 2.7 Number of operating theatres by number of emergency sessions per week

Surgical theatres	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	20	21	24	28	35
30									1											
25									1											
23																				1
22														1						
21												1								
19									2											
18					1				2											
17									2				1			1				
16				1	1				1								1			
15							1		3											
14					1					1			3							
13		1			3				2				1							
12					2			1	4		1		2						1	1
11					2	1		1	2											
10	1	1			9		2		3				1							
9		2		2	4	3			3				1							
8		1	1	1	12	1			7	1							1	1		
7			1	3	7	1		1	5								1			
6			1	2	6			1												
5		1			1								1		1					
4				1	6				3						1					
3				1	1								1				1			
2									1											

Emergency sessions

ten sessions per week. By contrast, emergency sessions are most prevalent for five or ten sessions per week (likely to be weekdays only), with a few hospitals having 14 sessions.

Ideally hospitals that admit emergency trauma should have a dedicated trauma list every day and those that admit surgical emergencies should have an emergency surgery session every day. These sessions should have dedicated, funded sessions for consultant surgeons and anaesthetists, and have the appropriate skill mix of allied health professionals and nursing staff available.

For smaller specialties and sub-specialties receiving emergency admissions, it may be difficult in small hospitals to achieve the critical mass required to provide dedicated, consultant staffed emergency sessions on a regular basis. Organisation of acute services should plan not only for the larger specialties, but also for the smaller more sub-specialised surgical disciplines.

Whilst the Audit Commission recently identified wide variations in the utilisation of operating theatres between hospitals [2], little mention was made of the need for these theatres to be staffed by appropriately trained surgeons and anaesthetists, together with all the other members of the team, including trained recovery staff. It is unlikely that despite the modest expansion in consultants, which has occurred in the five years since WOW I, that there will be sufficient trained surgeons to staff emergency and trauma lists in all of the hospitals examined in this study.

The only way to maintain a quality emergency surgical and trauma service is to ensure that there is careful planning and management of resources, so that acute hospitals are of sufficient size to justify the availability of fully staffed "NCEPOD theatres" 24 hours per day seven days per week together with supporting recovery staff. This cannot be achieved in all small hospitals, and is even more difficult to achieve for other surgical specialties where the critical mass must be even larger.

It is too simplistic a solution to state that some hospitals fail to use their theatres efficiently and that the number of sessions left clear to accommodate emergencies should be reduced. True, there may be a case to reapportion theatre time between specialties, and there may be some economies to be gained through this process, but the fundamental problem which needs to be addressed is the organisation of acute services, achieving the balance between scheduled and unscheduled sessions, all of which need to be staffed by appropriately trained medical and allied health professional staff.

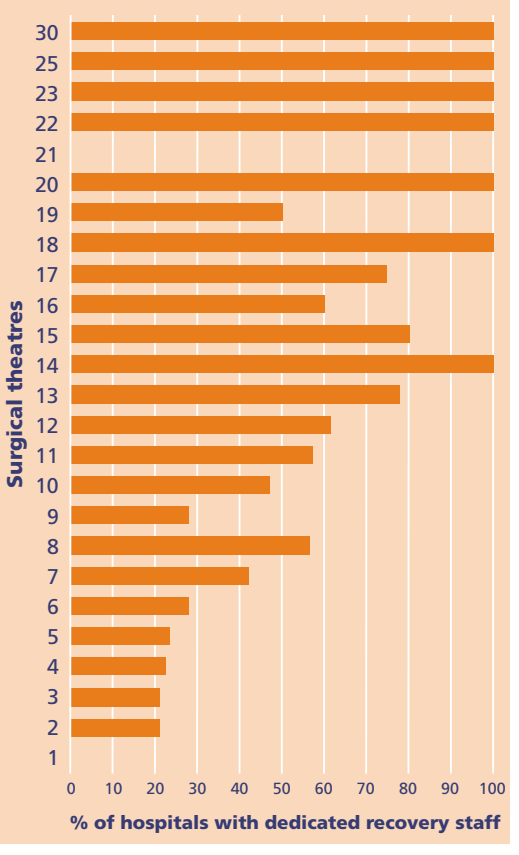
This cannot be done by NHS Trusts working in isolation, but needs to be tackled by Strategic Health Authorities.

Recovery staffing

Those NHS hospitals with a larger number of operating theatres are more likely to have dedicated recovery staff available 24 hours per day (Figure 2.1). This is likely to reflect the fact that in a larger hospital, there is a greater number of trained recovery staff who are available to man theatres on a 24 hour basis. It does not however guarantee that there are sufficient recovery staff available to cover all the operating theatres in use at a particular time.

It is clearly desirable that so far as is possible, patients are recovered by trained recovery staff.

Fig 2.1 **Availability of recovery staff 24 hours a day by number of operating theatres**



Consultant anaesthetist:

"As a consultant anaesthetist of many years' experience…I have never really come across a system which relies upon the scrub staff recovering patients as being as capable and safe as one where you have properly trained recovery nurses. There seems to be a large number of scrub staff who at night recover patients, and I think most people regard that as unacceptable. Recovering patients is a skilled business that should be carried out by staff who not only have proper training but also regularly practice it."

If dedicated recovery staff are not available who is responsible for recovering patients out of hours?

Table 2.8 Staff normally recovering patients out of hours

	Weekdays			Saturday			Sunday		
	18:00 - 22:00	22:01 - 23:59	00:00 - 07:59	18:00 - 22:00	22:01 - 23:59	00:00 - 07:59	18:00 - 22:00	22:01 - 23:59	00:00 - 07:59
Dedicated on-call recovery nurse	57	33	26	42	28	25	41	28	25
On-call theatre staff	47	67	74	59	70	76	61	70	75
On-call operating department personnel	2	6	8	5	8	9	5	8	9
Anaesthetist	5	3	4	6	4	4	7	4	4
Other	54	52	52	56	53	51	55	53	51
Blank	140	143	142	140	144	143	140	144	144
Dedicated on-call recovery nurse	19%	11%	8%	14%	9%	8%	13%	9%	8%
On-call theatre staff	15%	22%	24%	19%	23%	25%	20%	23%	24%
On-call operating department personnel	1%	2%	3%	2%	3%	3%	2%	3%	3%
Anaesthetist	2%	1%	1%	2%	1%	1%	2%	1%	1%
Other	18%	17%	17%	18%	17%	17%	18%	17%	17%
Blank	46%	47%	46%	45%	47%	46%	45%	47%	47%

As demonstrated in Table 2.8, out of hours and particularly at weekends, other on-call theatre staff most commonly recover patients. However on a few occasions, anaesthetists were recovering patients.

Consultant surgeon:

" …it is not appropriate for anaesthetists to be recovering patients."

Consultant surgeon:

" pursuing that point, that also means that the capacity of the theatres is limited because it is always the anaesthetist who is tied up on the next case." sic (should be starting the next case)

Consultant surgeon:

"You cannot run an emergency service out of hours if you tie up your anaesthetists."

In the independent sector, only 19/100 hospitals had dedicated recovery staff available 24 hours per day, and only nine hospitals had more than four operating theatres, so no conclusions could be drawn about the relationship between size and availability of recovery staff in this sector.

Resuscitation training

In NHS hospitals, 93% of responses indicated that recovery staff underwent resuscitation training at least annually. In the independent sector all staff had received resuscitation training within the past 12 months.

However, in the plenary session some advisors expressed reservations about this figure.

Consultant anaesthetist:

"I think there is a protocol in most hospitals that says that they should (have regular resuscitation training) and the managers fondly believe that they do, but we all know that they don't!"

Consultant anaesthetist:

"I am not surprised that the 'yes' response is high. I think that in most hospitals the recovery staff do get resuscitation training but the doctors do not."

Of the 23 consultant surgeons and anaesthetists present at the plenary session, only seven (30%) had undergone resuscitation training within the previous 12 months.

Consultant surgeon:

" I have to admit I have been offered it (resuscitation training), but do we all go?"

Consultant anaesthetist:

" The CNST (Clinical Negligence Scheme for Trusts) requirements are a bit more open minded. They say that the Trust must have a policy about who should receive resuscitation training…. I think Trusts and the general public would expect that all doctors would be competent to at least perform CPR (Cardio-pulmonary Resuscitation) to the level of a 16 year-old St John cadet."

The Resuscitation Council (UK) recommends:

"All doctors should have advanced resuscitation training. Nursing staff should have training to a standard compatible with their level of experience and expected duties within hospital. Ideally, doctors in acute specialties and appropriate nursing staff should hold a valid Resuscitation Council (UK) Advanced Life Support Certificate.

All hospital based resuscitation training should be repeated and reassessed at regular intervals. Training should be valid for a fixed period of time only, with updates recommended yearly as a minimum"[8].

NCEPOD would endorse these recommendations.

Monitoring equipment

In NHS hospitals, 90% had a pulse oximeter and 80% an ECG monitor available for each recovery bay. For independent hospitals, 89% had a pulse oximeter and 85% an ECG monitor for each recovery bay.

The Association of Anaesthetists of Great Britain and Ireland recommends the following [9]:

"Monitoring devices must be attached before induction of anaesthesia and their use continued until the patient has recovered from the effects of anaesthesia.

All information provided by monitoring devices should be recorded in the patient's notes. Trend display and printing devices are recommended as they allow the anaesthetist to concentrate on managing the patient in emergency situations.

Only a brief interruption of monitoring is acceptable if the recovery area is immediately adjacent to the operating theatre. Otherwise monitoring should be continued during transfer to the same degree as any other intra or inter hospital transfer.

A high standard of monitoring should be maintained until the patient is fully recovered from anaesthesia. Clinical observations must be supplemented by the following monitoring devices.

- Pulse oximeter
- Non-invasive blood pressure monitor

The following must also be immediately available

- Electrocardiograph
- Nerve stimulator
- Means of measuring temperature
- Capnograph"

Consultant anaesthetist:

"It is unsafe practice to recover patients without a pulse oximeter or ECG."

Consultant surgeon:

"There might be a situation where there are theatres that are only undertaking local anaesthetic procedures and I would ask my anaesthetic colleagues whether it is necessary to have a pulse oximeter and ECG?"

Consultant anaesthetist:

" I can answer that because the recommendations are that anybody having a procedure under local anaesthetic should have exactly the same monitoring as somebody who is having general anaesthetic."

The Association of Anaesthetists recommends [9]:

"Regional Techniques & Sedation for Operative Procedures

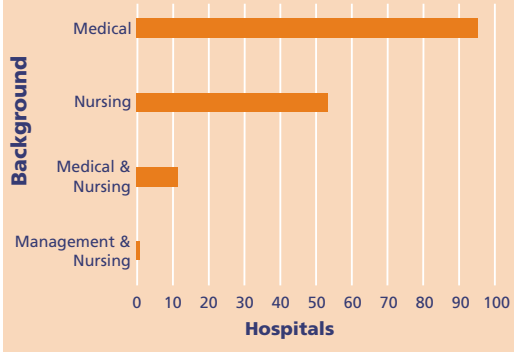
Patients must have appropriate monitoring, including the following devices.

- Pulse oximeter
- Non-invasive blood pressure monitor
- Electrocardiograph"

Theatre arbitrator

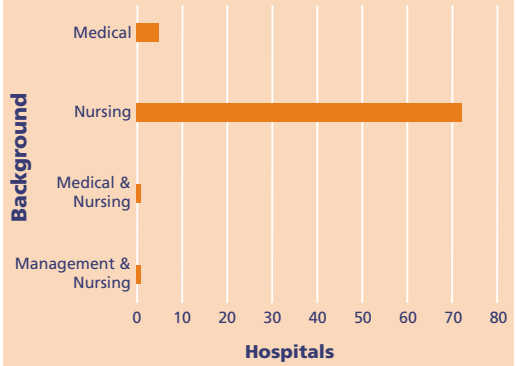
In the WOW II study, only 55% of NHS hospitals indicated that there was a designated theatre arbitrator. In the majority of cases this individual was from a medical background (Fig. 2.2).

Fig 2.2 Background of NHS hospital arbitrators



By way of contrast, 81% of independent hospitals indicated that there was a designated arbitrator. In the majority of cases, this individual was from a nursing background (Fig. 2.3).

Fig 2.3 Background of independent hospital arbitrators



Audit

In response to the question: "Do the operating theatres have clinical audit meetings?" 67% of NHS hospitals indicated that they did, but only 51% of independent hospitals answered in the affirmative.

Of those hospitals undertaking theatre audit, 86% in the NHS and 96% of independents examined the pattern of work in the operating theatres.

Consultant surgeon:

"In many hospitals such as my own, the anaesthetic directorate decides to have audit meetings at which time it withdraws its services. Therefore all elective surgery stops during those times and therefore there is a scheduled audit meeting for everybody. Whether the staff actually attend those meetings is another matter, and I don't think that has been asked."

Manager:

"Unfortunately we all have our own separate audits…the theatre staff audits are the theatre sisters just discussing incidents. We need multi-disciplinary audits, but I am not sure what is the best way to go about them."

Consultant surgeon:

"In the children's hospital we have an audit session at which the whole hospital is supposed to stop working, apart from emergencies. We have consequently managed to have multi-disciplinary audits."

Consultant surgeon:

"In our Trust, clinicians have been trying to push for an all day audit, but the Trust is quite resistant to that because the impact that that would have on its waiting lists and throughput is quite considerable. I would welcome having the opportunity to audit with my anaesthetic colleagues, but it is very difficult unless pressure is put on Trusts to actually insist that they would have time to do it."

Manager:

"I don't think there is such a clear tension between elective activity and audit. First, believe it or not, I think managers do care about the quality of care that patients receive. Secondly, I think even if one was being a bit cynical, if you are going to look at what determines star status, the CHI report is a powerful influence and the CHI inspection will look for good quality audit taking place."

In 34 % of NHS hospitals and 31% of independent hospitals, the grades of the surgeons and/or anaesthetists present during an operation was still not being recorded because hospitals do not have adequate information systems in theatres. This is a lamentable deficiency.

EFFECT OF HOSPITAL THEATRE CAPACITY UPON NIGHT TIME OPERATING

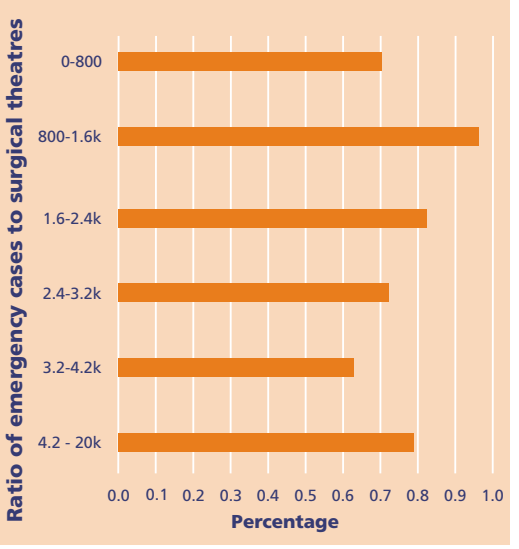
This study has tried to explore whether there is a relationship between the "surgical capacity" of a hospital and the amount of operating out of hours. For each hospital, the total number of emergency admissions per year, was divided by the number of operating theatres. Hospitals were then placed in six bands ranging from 0 - 800 emergency admissions per year per operating theatre, up to 4,200 - 20,000 admissions per year per operating theatre (Figure 2.4). The number of operations out of hours was then plotted in the five most common categories of reason for operating out of hours. As can be seen from Table 2.9, the majority of reasons given justified night time operating on clinical grounds.

Unfortunately, out of the 775 night time operations, no reason was received in 69% of cases. It is therefore likely that the reasons stated in the 31% of responses received are biased toward clinically justifiable reasons. Is it possible that in the majority of cases surgeons were unable to justify operating at night?

The majority of cases were undertaken in hospitals which had a ratio of emergency admissions to theatres of 0 : 3,200. There was no significant difference in the percentage of total surgical cases performed at night depending upon the type of hospital defined by the ratio of emergency admissions to the number of surgical theatres. There does not appear to be any evidence to show that hospitals with a low ratio of theatres to emergency admissions are likely to operate more frequently at night.

Similarly, there does not appear to be any relationship between the surgical capacity of the hospital and delays occurring between admission and time of surgery. However, data were received from only 49% of hospitals regarding delay, and it is therefore difficult to draw meaningful conclusions given such a poor response rate. From the data that we have received however, it is apparent that hospitals of similar size have widely varying degrees of performance with regard to delay. This could be due to variations in staffing levels, or differences in the efficiency of managing services.

Fig 2.4 Ratio of theatres to emergency admissions, and percentage of total cases within that type of hospital performed at night



As can be seen from Table 2.9, where a response was received, in most cases there was clinical justification for the case being done at night. However, on a small number of occasions, cases were being operated upon at night because there was either no daytime emergency theatre, or the designated emergency theatre slot was over-booked.

Table 2.9 Reasons for night time operating in different types of hospital

	Ratio of emergency admissions to surgical theatres											
Reason	0-800 (%) n=136		800-1.6k (%) n=92		1.6-2.4k (%) n=100		2.4-3.2k (%) n=59		3.2-4.2k (%) n=7		4.2 - 20k (%) n=3	
Justified on clinical grounds	33	(24)	32	(35)	34	(34)	28	(47)	3	(43)	1	(33)
Daytime theatre already fully utilised	3	(2)	4	(4)	3	(3)	1	(2)	0	(0)	1	(33)
No daytime emergency theatre	3	(2)	0	(0)	1	(1)	2	(3)	0	(0)	0	(0)
Did not need to be done out of hours	0	(0)	0	(0)	1	(1)	0	(0)	0	(0)	1	(33)
Evening/weekend trauma list	0	(0)	0	(0)	0	(0)	1	(2)	0	(0)	0	(0)

GRADE OF SURGEON AND ANAESTHETIST FOR URGENT AND EMERGENCY PROCEDURES

It would appear that the hospitals in the middle of the range of the number of operating theatres are more likely to rely upon Staff and Associate Specialist (SAS) grades both to operate upon and anaesthetise urgent and emergency patients whereas, those hospitals with a larger surgical capacity tend to rely upon either consultants or trainees. Notably, in hospitals with only a few theatres, a high percentage of cases are operated upon and anaesthetised by consultants (Figures 2.5 and 2.6).

Whilst it is perhaps difficult to draw firm conclusions about what these data shows us, what we are able to say is that there is considerable variation in the patterns of seniority of staff who are available in hospitals with different levels of surgical capacity. In hospitals with large numbers of theatres, most emergency surgery is both operated upon and anaesthetised by either consultants or trainees. This is probably a reflection upon the fact that a hospital must reach a critical mass before there are sufficient numbers of trainees to be available at night. Whilst it is recognised that there is a need for trainees to operate and anaesthetise in the emergency setting, it is also important that "fresh consultants" are available to supervise these trainees, if required to do so.

The hospitals in the middle range seem to rely more upon SAS grade staff. Could this be because they are unable to cover all emergency work whilst also complying with the requirements of junior doctors' hours?

The small hospitals appear to rely much more upon consultants. Do these staff have dedicated sessions for trauma and do they have time off for rest if they have been operating out of hours?

Fig 2.5 Grade of most senior surgeon present for emergency or urgent operation by number of theatres in hospital

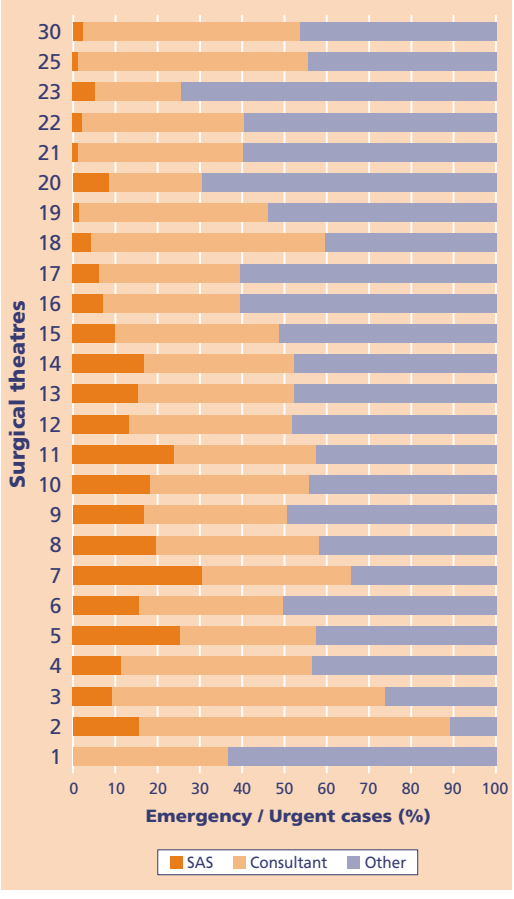


Fig 2.6 Grade of most senior anaesthetist present for emergency or urgent operation by number of theatres in hospital