

# 3 SURGERY

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## 3. SURGERY

### INTRODUCTION

The process for the collection of surgical data is described in Appendix D (see page 131). The data relating to the sample cases were reviewed by advisors relevant to the specialty involved; their respective specialist associations and colleges nominated these advisors. The assistance of the advisors (see page v) is gratefully acknowledged.

The intention of this report is to compare, as much as possible, the data from deaths in 1998/99 with that derived from deaths in 1990<sup>4</sup>. The significant information from each specialty within the generality of surgery is presented together with commentary, illustrative case notes and comparative data from 1990 where possible (no data was stored from 1990 other than the printed report) and appropriate. As a result of this approach only relevant tables are included. The full data are available as a supplement from NCEPOD.

NCEPOD received notification of 19 832 deaths occurring during 1998/99 (see general data section). The deaths selected for a more detailed review were a random sample of one in ten cases. The tables and comments that follow summarise data from the 1518 surgical questionnaires reviewed. The surgical questionnaire is reproduced in full in the data supplement.

### REVIEW OF 1998/99 SURGICAL DATA AND COMPARISONS WITH 1990

#### Key Points

- *The sample of patients who died shows that they are older, sicker and more likely to be admitted as an emergency than was the case in 1990.*
- *Delay in referral from medical specialties was a factor in a number of deaths.*
- *Consultant involvement with these ill patients continues to rise.*
- *The provision of ICU beds has improved since 1990 but there is still a lack of HDU facilities.*
- *The use of clinical audit appears to be quite variable between surgical specialties.*
- *There may be a need to check the accuracy of returned questionnaires.*

### HOSPITALS AND FACILITIES

Table 3.1: Type of hospital in which the final operation took place

Hospital type	1998/99		1990	
District general (or equivalent)	1045	69%	1993	78%
University/teaching	388	26%	449	18%
Limited surgical specialties	34	2%	66	3%
Community	1	<1%	3	<1%
Independent	13	1%	29	1%
Defence medical services	0	-	11	<1%
Other	0	-	7	<1%
Not answered	37	2%	0	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

The comparative figures in Table 3.1 are not dissimilar but the increasing percentage of operations done in university/teaching hospitals might suggest a move towards specialisation or recognition that the more complex procedures require an increased level of backup services. Another explanation is that more hospitals which were 'district generals' are now classified as 'teaching hospitals' although they are essentially the same as before.

**Question 3.1: Is a theatre recovery area available in the hospital in which the final operation took place?**

	1998/99		1990	
Yes	1492	98%	2330	91%
No	8	<1%	228	9%
Not answered	18	1%	0	-
Total	1518		2558	

**If yes, is this available and staffed 24 hours per day, 7 days per week?**

	1998/99	
Yes	1160	78%
No	258	17%
Not answered	73	5%
Not known	1	<1%
Total	1492	

There appears to have been an increase in the availability of theatre recovery areas but 17% (258/1492) of these are not available round the clock throughout the week. Deficiencies of provision in this area can affect outcome.

**Question 3.2: Is an adult ICU available in the hospital in which the final operation took place?**

	1998/99		1990	
Yes	1423	94%	2208	86%
No	52	3%	350	14%
Not answered	43	3%	0	-
Total	1518		2558	

**If yes, is this available and staffed 24 hours per day, 7 days per week?**

	1998/99	
Yes	1295	91%
No	5	<1%
Not answered	123	9%
Total	1423	

There has clearly been an increase in the provision of adult ICU beds, the majority of which are open 24 hours each day. This change is to be welcomed and can only be a benefit to patient care. The lack of an ICU bed can spell disaster.

**CASE 1** • A 78-year-old patient suffered a perforated duodenal ulcer, which was appropriately repaired. There was no ICU bed available immediately postoperatively. A period of 48 hours passed before the patient was admitted to an ICU by which time he was in heart failure with a possible pulmonary embolus and cerebrovascular problems. He died 16 days after surgery.

In the case described above, there was an ICU in the hospital but there were no vacant beds. This is a common scenario and reflects the demand that exists for this service.

**Question 3.3: Is an adult HDU available in the hospital in which the final operation took place?**

	1998/99		1990	
Yes	943	62%	683	27%
No	519	34%	1875	73%
Not answered	56	4%	0	-
Total	1518		2558	

**If yes, is this available and staffed 24 hours per day, 7 days per week?**

	1998/99	
Yes	836	89%
No	46	5%
Not answered	61	6%
Total	943	

There has been a spectacular increase in the provision of HDU beds when compared to the 1990 data. However, in 1998/99 an HDU bed was available round the clock in only 55% (836/1518) of cases; a considerable margin for improvement still exists. Patients may need to be nursed in general wards when an HDU bed would be more appropriate. When a sick patient is returned to ward care from theatre at night the staffing levels are often lower than during the daytime and there are fewer senior medical staff available. These circumstances can be detrimental to the outcome (see also page 40).

## PATIENT PROFILE

### Age and sex

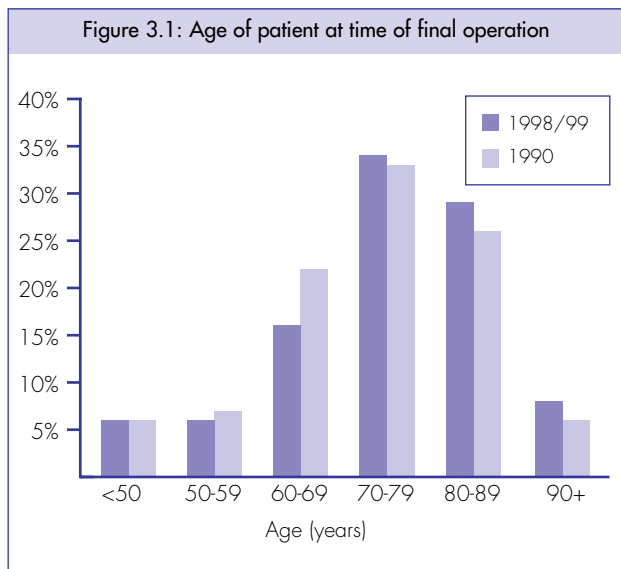


Figure 3.1 shows that there has been a shift in age groups with an increase in older patients in the 1998/99 sample.

There was a similar overall ratio of females to males (1:1.1) compared to the sample of 1990 (1:1.2).

Sex	Number
Male	782
Female	736
<b>Total</b>	<b>1518</b>

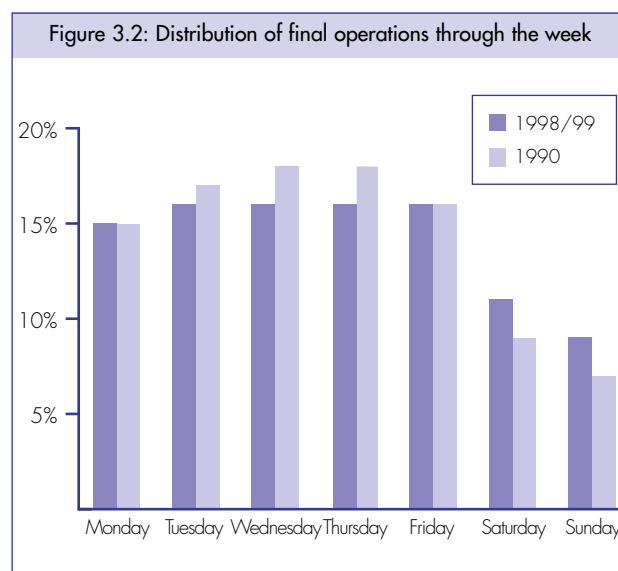
### Admission and operation

Day	Number
Monday	266
Tuesday	239
Wednesday	219
Thursday	229
Friday	214
Saturday	159
Sunday	179
Not answered	13
<b>Total</b>	<b>1518</b>

The 1990 data revealed that 78% of surgical admissions took place between Monday and Friday. The current data show a similar percentage with 77% (1167/1518) of admissions occurring during weekdays.

Category	1998/99		1990	
Elective	326	21%	718	28%
Urgent	165	11%	507	20%
Emergency	1020	67%	1326	52%
Not answered	6	<1%	7	<1%
Not known	1	<1%	0	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

There has been a dramatic rise in the percentage of emergency admissions overall (from 52% in 1990 to 67% in 1998/99). This represents a significant unplanned workload for surgical and anaesthetic departments and also reflects the seriousness of the conditions requiring admission.



There has been little change in the pattern of the timing of the final operation.

## TRANSFER, REFERRAL AND DELAY

### Transfer

Referring hospital	Number
District general (or equivalent)	121
University/teaching	46
Limited surgical specialties	7
Community	23
Independent	3
Nursing home	10
Not answered	6
Not known	1
<b>Total</b>	<b>217</b>

It seems curious that in 46 cases university/teaching hospitals transferred patients; the reasons given are shown in Table 3.6.

Reason for transfer	Number
For specialist cardiac surgery	12
For specialist neurosurgery	10
For specialist vascular surgery	4
For specialist burns treatment	2
For specialist urological treatment	2
For specialist paediatric treatment	2
Other	14
<b>Total</b>	<b>46</b>

The comparative figures in Table 3.7 are broadly similar but there appears to be more movement of patients within and between regions. Is this due to problems with the availability of ICU beds?

Location	1998/99		1990	
Same district (or equivalent)	89	41%	153	49%
Same region	86	40%	104	33%
Different region	25	12%	18	6%
Overseas	3	1%	2	1%
Not answered	14	6%	23	7%
Other	0	-	13	4%
<b>Total</b>	<b>217</b>		<b>313</b>	

### Question 3.4: Did the patient's condition deteriorate during transfer?

	1998/99		1990	
Yes	15	7%	23	7%
No	191	88%	276	88%
Not answered	7	3%	14	4%
Not known	4	2%	0	-
<b>Total</b>	<b>217</b>		<b>313</b>	

These unstable and ill patients required transfer because of the severity of their condition or the need for specialist treatment. The figure for deterioration during transfer (7%) has not changed over the years. We commended this low figure previously and do so again.

### Referral

Sixty-seven percent of all admissions (1010/1518) were admitted directly under the care of the surgeon whose team undertook the final operation. Where internal referrals or transfers occurred the source of referral is shown in Table 3.8.

Source	Number
Medical specialty	302
Another surgical specialty	56
Same surgical specialty	69
Other	1
Not answered	6
<b>Total</b>	<b>434</b>

Delays in referral from other specialties, especially medicine, were frequently commented on by the advisors.

**CASE 2** • A 77-year-old patient was admitted to an elderly medicine unit following a domiciliary visit. He suffered from anorexia and weight loss, and it appears that a diagnosis of subacute intestinal obstruction was made. The patient was referred to a surgeon five weeks later when a Picolax bowel preparation caused a perforation of a carcinoma of the descending colon. Despite emergency surgery (Hartmann's procedure) he died from respiratory failure 48 hours later.

The surgeon wrote: 'He was investigated unsuccessfully on the geriatric medical wards for just over five weeks!! The decision to slavishly pursue a diagnosis by means of colonoscopy or barium enema was, in my view, a major factor in delaying surgical intervention.'

There are examples of similar delays in other sections. Clearly there is a need to involve physicians in surgical audit in order that they understand the implications of their actions and the need for early referral.

## Delay

**Question 3.5: Did any undesirable delays occur between the decision to operate and the actual date of surgery?**

Yes .....	154
No .....	1321
Not answered .....	42
Not known .....	1
<b>Total .....</b>	<b>1518</b>

Theatre availability was the most common cause of delay once a decision to operate had been made.

**Question 3.6: Had this patient's admission been cancelled by the surgical service on a previous occasion, for any reason other than a clinical one?**

Yes .....	17
No .....	1437
Not answered .....	62
Not known .....	2
<b>Total .....</b>	<b>1518</b>

**Question 3.7: In your opinion did any of these delays affect the outcome?**

Yes .....	17
No .....	139
Not answered .....	8
<b>Total .....</b>	<b>164</b>

This situation is similar to that reported in the 1990 data in that the outcome for approximately 1% of patients who died may have been influenced by delays (in the opinion of the reporting surgeon). Given the increasing load of emergencies within surgery, and the continuing heavy workload in general, it is a credit to the service that the situation has not deteriorated.

The comparisons in Table 3.9 are not entirely accurate, as the data gathered were different between the two samples. Some broad comments are possible however. The striking fact is the similarity of the figures from the two samples, with similar percentages of patients coming from surgical wards, medical wards and proceeding directly to the operating theatre. The site of admission was considered to be inappropriate in 5% of cases compared to 3% in the earlier sample.

Table 3.9: Type of area to which the patient was first admitted in the hospital in which the final operation took place

Area	1998/99		1990	
General surgical ward	520	34%	1494	58%
Surgical specialty ward	498	33%	*	
Mixed medical/surgical ward	*		38	1%
Gynaecology/obstetric ward	16	1%	36	1%
Medical ward	170	11%	402	16%
Elderly medicine ward	39	3%	*	
Admission ward	41	3%	33	1%
A&E ward	68	4%	163	6%
Day unit	7	<1%	3	<1%
HDU	25	2%	28	1%
ICU	63	4%	63	2%
Coronary care unit (CCU)	13	1%	*	
Direct to theatre	39	3%	81	3%
Other	19	1%	173	7%
Not answered	0	-	44	2%
<b>Total</b>	<b>1518</b>		<b>2558</b>	

\* Not a separate category in 1990 question

## STAFFING

Table 3.10: Specialty of consultant surgeon in charge at time of final operation

Specialty	1998/99		1990	
General	115	8%	1623	63%
General with special interest	642	42%	*	
Orthopaedic	336	22%	414	16%
Cardiac/thoracic/cardi thoracic	108	7%	73	3%
Vascular	99	7%	*	
Urology	71	5%	107	4%
Neurosurgery	69	5%	94	4%
Otorhinolaryngology	19	1%	29	1%
Gynaecology	16	1%	141	6%
Plastic	15	1%	11	<1%
Ophthalmology	8	<1%	6	<1%
Oral & maxillofacial	6	<1%	3	<1%
Paediatric	6	<1%	*	
Transplantation	3	<1%	*	
Accident & Emergency	0	-	6	<1%
Other	2	<1%	0	-
Not answered	3	<1%	51	2%
<b>Total</b>	<b>1518</b>		<b>2558</b>	

\* Not a separate category in 1990 question

The vagaries of the sampling process account for some differences in the spread of specialties shown in Table 3.10. There was a preponderance of general surgeons in the 1990 sample whereas in the later sample many surgeons have declared a special interest, thus reflecting the change in surgical practice that is taking place. Allowing for these differences the samples are reasonably comparable. It is also interesting to note the improvement in data provision in the later sample with a minimal number of questionnaires in which this question was not answered.

### Question 3.8: Was care undertaken on a formal shared basis?

	1998/99		1990	
Yes	386	25%	609	24%
No	1081	71%	1911	75%
Not answered	50	3%	38	1%
Not known	1	<1%	0	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

The aim of Question 3.8 was to assess the amount of medical or other specialty input into the care of surgical patients. The question is based on the general belief that, when time allows, advice from doctors other than anaesthetists concerning the management of comorbidities may contribute to a better outcome for the patient. There has been no change between the two samples with

approximately a quarter of patients being managed jointly. Where joint care did occur in the latest sample the specialties involved are shown in Table 3.11.

Table 3.11: Specialties involved in shared care of surgical patients (386 cases; answers may be multiple)

Specialty	Number
Medical specialty	173
Care of the elderly	85
General medicine	73
Other surgeon	69
Paediatric	7
Other	7



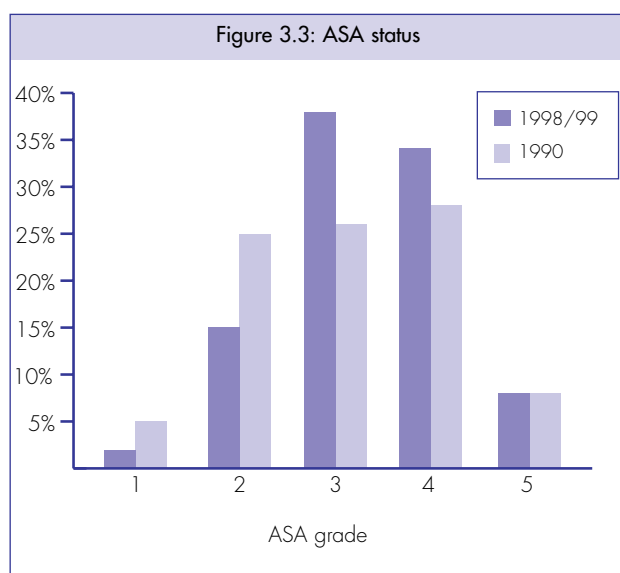
Table 3.12: Grade of the most senior surgeon consulted before the operation

Grade	Number
Consultant	1399
Associate specialist	15
Staff grade	15
SpR with CCST	11
SpR 4 or greater	33
SpR 3	13
SpR 2	3
SpR 1	3
Visiting SpR	3
Locum appointment (training)	2
Locum appointment (service)	12
Premier SHO	3
SHO 1	1
Not answered	5
<b>Total</b>	<b>1518</b>

The data from the two samples are not comparable, as the nature and nomenclature of training posts in surgery have changed. In the 1990 sample an experienced opinion was sought in 84% of cases. In the latest sample a consultant or specialist registrar with a CCST was consulted in 93% of cases (1410/1518). This represents increasing good practice. However, the 1998/99 data show that a consultant or specialist registrar with a CCST took the consent of the patient in only 36% of cases (553/1518) (see page 74 for section on Consent).

## PREOPERATIVE STATUS

### ASA status



Surgeons are notoriously poor at assessing ASA class and may apply the criteria retrospectively. Based on the data submitted to NCEPOD, Table 3.13 and Figure 3.3 show an increase in ill patients (ASA 3 & 4) in the 1998/99 sample. This coincides with the increase in emergency admissions, the rising age of the patients and the high percentage of comorbidity present in the 1998/99 sample (85%, 1290/1518 cases).

Table 3.13: ASA status

ASA status	1998/99		1990	
ASA 1	35	2%	135	5%
ASA 2	223	15%	628	25%
ASA 3	584	38%	669	26%
ASA 4	514	34%	723	28%
ASA 5	122	8%	213	8%
Not answered	32	2%	190	7%
Not known	8	1%	-	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

## Comorbidity

The main comorbidities identified are shown in Table 3.14.

This pattern of coexisting pathology is identical to that seen in the 1998/99 sample. The influence that these diseases had on the final outcome and the therapeutic manoeuvres taken to improve the patient's condition will be discussed in the individual sections if appropriate.

Table 3.14: Coexisting medical disorders (1290 cases; answers may be multiple)

Coexisting disorders	Number
Cardiac	684
Respiratory	461
Renal	246
Malignancy	239
Neurological	238
Vascular	180
Diabetes	148
Sepsis	142
Gastrointestinal	140
Haematological	135
Musculoskeletal	134
Psychiatric	96
Other endocrine	89
Alcohol related	41
Drug addiction	6
Other	11

Table 3.15: Anticipated risk of death related to the proposed operation

Risk of death	1998/99		1990	
Not expected	184	12%	355	14%
Small but significant risk	320	21%	626	24%
Definite risk	876	58%	1286	50%
Expected	122	8%	222	9%
Not answered	16	1%	69	3%
<b>Total</b>	<b>1518</b>		<b>2558</b>	

Table 3.15 shows a small increase in those patients who were assessed by the surgeon as being at a definite risk of death; this correlates with other indications that the surgical workload is increasing in severity and risk.

## Thromboembolic prophylaxis

### Question 3.9: Do you have a protocol based on THRIFT for thromboembolic prophylaxis?

Yes .....	994
No .....	448
Not answered .....	75
Not known .....	1
<b>Total .....</b>	<b>1518</b>

Despite the awareness of the dangers of postoperative thromboembolism and recommendations from groups such as THRIFT (Thromboembolic Risk Factors Consensus Group)<sup>41,42</sup> and NCEPOD<sup>9</sup>, there was a low use of prophylactic protocols. Thirty percent (448/1518) of the patients may not have received prophylaxis in the absence of a protocol. There were at least 43 deaths associated with pulmonary embolism and a large number of cardiac events which might have been embolic but for which there is no postmortem examination proof.

When a protocol was in operation, patients were assessed for risk as shown in Table 3.16.

Table 3.16: Thromboembolic risk

Risk category	Number
High	494
Medium	361
Low	115
Not answered	22
Not known	2
<b>Total</b>	<b>994</b>

At least 106 patients (7%, 106/1518) received no prophylaxis whatsoever.

## THE OPERATION

Table 3.17: Classification of operation

Classification	1998/99		1990	
Emergency	266	18%	455	18%
Urgent	738	49%	1044	41%
Scheduled	395	26%	825	32%
Elective	109	7%	226	9%
Not answered	10	<1%	8	<1%
<b>Total</b>	<b>1518</b>		<b>2558</b>	

These figures indicate a small increase in urgent operations, which mirrors the rise in emergency admissions.

Table 3.18: Overall consultant involvement

Consultant involvement	Number
Operating	797
Present in theatre	171
Not in theatre, but immediately available	101
Consulted before operation	375
No consultant involvement	74
<b>Total</b>	<b>1518</b>

In only 5% of cases was there no consultant involvement. Consultant availability is desirable, if only to delegate appropriately. When an experienced and competent trainee is operating the consultant continues to carry responsibility and must be able to provide cover and supervision (or must have nominated a colleague).

## The surgeon

Table 3.19: Most senior surgeon present in the operating room

Grade	Number
Consultant	963
Associate specialist	41
Staff grade	83
Clinical assistant/hospital practitioner	5
SpR with CCST	62
SpR 4 or greater	144
SpR 3	68
SpR 2	50
SpR 1	16
Visiting SpR	22
Locum appointment (training)	9
Locum appointment (service)*	20
Premier SHO	21
SHO 2	9
SHO 1	1
Not answered	2
Not known	2
<b>Total</b>	<b>1518</b>

\* Includes 5 locum (service) consultants

Table 3.20: Most senior operating surgeon

Grade	Number
Consultant	792
Associate specialist	40
Staff grade	90
Clinical assistant/hospital practitioner	6
SpR with CCST	63
SpR 4 or greater	184
SpR 3	100
SpR 2	62
SpR 1	35
Visiting SpR	33
Locum appointment (training)	12
Locum appointment (service)*	22
Premier SHO	43
SHO 2	20
SHO 1	1
Pre-registration house officer	1
Not answered	12
Not known	2
<b>Total</b>	<b>1518</b>

\* Includes 5 locum (service) consultants

Consultants operated on 52% (792/1518) of patients. This is identical to the involvement of consultant surgeons in 1990 (52%, 1341/2558). These figures show a minimal improvement on the original CEPOD report<sup>43</sup> where it was reported that 47% of procedures were performed by consultants.

The fall in numbers operated on by registrars has been compensated for by an increase in the activities of NCCG surgeons.

Figure 3.4: Grade of operating surgeon

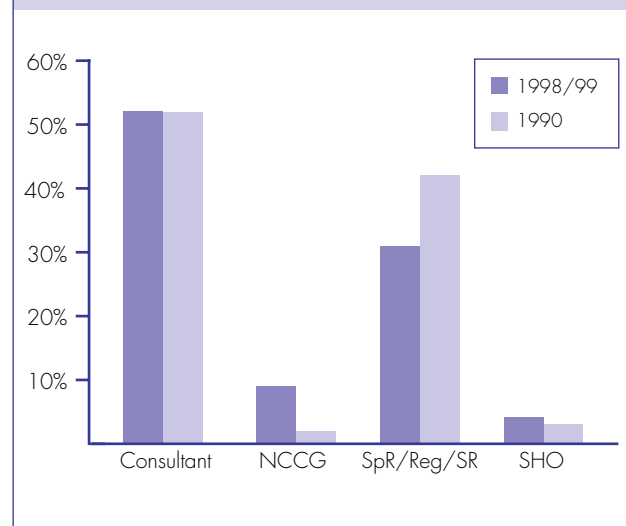


Table 3.21: Most senior surgeon involved in any way (including preoperative consultation) where no consultant involvement was detailed

Grade	Number
Associate specialist	14
Staff grade	11
SpR with CCST	9
SpR 4 or greater	23
SpR 3	5
SpR 2	4
SpR 1	1
Visiting SpR (or year not known)	3
Locum appointment (training)	1
Locum appointment (service)	2
Premier SHO	1
<b>Total</b>	<b>74</b>

None of the patients treated by the surgeons in Table 3.21 was moribund (ASA 5) at the time of surgery and many of the procedures were appropriate for the level of expertise available. Where cases were thought to be inappropriate, comments have been made in the specialty sections.

**Question 3.10: If the most senior operator was not a consultant, was a more senior surgeon immediately available, i.e. in the operating room/suite?**

Yes .....	357
No .....	319
Not answered .....	40
Not known .....	5
<b>Total .....</b>	<b>721</b>

Of the 30 cases shown in Table 3.23 it seems unlikely that certain grades would not have a higher degree; it is more likely that the individual filling in the questionnaire could not be bothered to supply accurate information. However, if the statements are true, then there would appear to be a problem in orthopaedic and general surgery. In these specialties individuals without a higher diploma appear to hold quite senior posts, including training posts. How likely is this?

Table 3.22: Higher diploma(s) in surgery held at the time of operation (1518 cases; answers may be multiple)

Diploma	Number
None	30
Part 1 Fellowship	155
Part 2 or Membership	133
Fellowship	1156
Part 3 Intercollegiate Assessment	266
MS/MD*	530
Other	11

\* The wording of the question makes it impossible to identify how many of these were awarded by qualifying exam and how many by submission of a thesis.

Table 3.23: Procedures, grade of most senior operating surgeon and specialty of surgeon in charge for cases where no higher diploma(s) indicated

Most senior operating surgeon	Specialty of surgeon in charge	Special interests	Procedure
Consultant	General	Upper GI/HPD	OGD
Consultant	Orthopaedic		Posterolateral spinal cord decompression & posterior fixation of spine
Consultant	Vascular		Above knee amputation
Consultant	Neurosurgery		Percutaneous CT guided spinal needle biopsy
Associate specialist	Orthopaedic		Hemiarthroplasty
Associate specialist	Orthopaedic		Insertion of two cannulated hip screws
Staff grade	Orthopaedic		Hemiarthroplasty
Staff grade	General		Laparotomy & gastrotomy
Staff grade	Orthopaedic		Internal fixation fractured femoral neck
Staff grade	Orthopaedic		Repair soft tissue injury to calf
Staff grade	General	Upper GI	Laparotomy, peritoneal lavage, ileostomy and mucous fistula
Staff grade	General	Vascular	Bilateral Gritti-Stokes amputation
Staff grade	Orthopaedic		Cemented Thompson hemiarthroplasty
Staff grade	Orthopaedic		Debridement & split skin grafting ankle
Staff grade	Orthopaedic		Internal fixation (sliding hip screw)
Staff grade	Orthopaedic		Thompson hemiarthroplasty
Staff grade	Orthopaedic		Total hip replacement
SpR 4+	General	Gastroenterology	Laparotomy & oversewing of perforated gastric ulcer
SpR 3	Orthopaedic		Internal fixation (sliding hip screw)
SpR 3	General	Vascular	Hartmann's procedure & caecostomy (multiple peritoneal seedlings present in pelvis)
Visiting SpR	Orthopaedic		Open reduction and internal fixation using sliding hip screw
Premier SHO	General	Vascular	Below knee amputation
Premier SHO	Otorhinolaryngology		Incision and drainage of retropharyngeal abscess
SHO 2	General	Breast and endocrine	Insertion of intercostal drain
Locum SpR	General		Hysteroscopy & endometrial biopsy
SHO 2	Orthopaedic		Internal fixation (sliding hip screw)
SHO 2	Orthopaedic		Cemented total hip replacement
SHO 2	General	Vascular	Amputation 5th toe
SHO 2	General	Breast surgery	Insertion of subclavian central venous catheter
House officer	General	Colorectal	Drainage of ascites on ward

## Local anaesthesia and sedation

Table 3.24: Procedures performed solely under local anaesthetic and/or sedation administered by the surgeon

Procedure	Number
OGD	20
Femoral embolectomy/thrombectomy/endarterectomy	11
Flexible sigmoidoscopy/colonoscopy	5
Biopsy of skin nodule	5
PEG insertion	4
Incision & drainage of abscess	3
Lens extraction & intraocular prosthesis insertion	3
Drainage of ascites	3
Lymph node biopsy	3
Percutaneous needle biopsy	2
Suturing laceration	2
Insertion or unblocking oesophageal stent	2
Insertion of biliary stent	2
Burr holes	2
Miscellaneous	22
<b>Total</b>	<b>89</b>

### Question 3.11: Was the procedure performed solely under local anaesthetic and/or sedation administered by the surgeon?

Yes	89
No	1335
Not answered	93
Not known	1
<b>Total</b>	<b>1518</b>

Endoscopies and femoral embolectomies were the most common procedures as they were in the 1990 report. Amongst the 'miscellaneous' procedures there were two major operations (a below knee amputation and a Thompson's hemiarthroplasty) for which it is unlikely that the surgeon administered the local anaesthesia. These were most probably performed under some form of regional anaesthesia. This is another example of failure to read the question and provide accurate, believable answers.

Table 3.25 shows that whilst the use of pulse oximetry has increased, other forms of monitoring are used less frequently than previously and a slightly higher percentage of patients had no monitoring whatsoever. In 1993 a working party commissioned by the Royal College of Surgeons of England published a report on sedation administered by non-anaesthetists<sup>44</sup>. This report pointed out to surgeons that the adoption of monitoring standards would increase patient safety. It recommended that the use of oximetry should be standard practice in all circumstances where patients are receiving intravenous sedation administered by surgeons. These recommendations are frequently being ignored.

Table 3.25: Monitoring during procedures performed solely under local anaesthetic and/or sedation by the surgeon

Monitoring	1998/99 (89 cases)		1990 (163 cases)	
Blood pressure	59	66%	128	79%
Pulse	66	74%	143	88%
ECG	23	26%	70	43%
Pulse oximetry	63	71%	72	44%
Other	3	3%	7	4%
None	9	10%	9	6%

## POSTOPERATIVE CARE

Table 3.26: Destination of the patient immediately after leaving the recovery suite

Destination	Number
ICU	449
HDU	118
Other specialised unit	27
Specialist ward	372
General surgical ward	396
General medical ward	34
Other	4
Died in theatre	63
Died in recovery	28
Not answered	26
Not known	1
<b>Total</b>	<b>1518</b>

Table 3.27: Reason for discharge from ICU/HDU/CCU

Reason	1998/99		1990	
Elective transfer to ward	168	28%	260	29%
Pressure on beds	7	1%	14	2%
Death	335	55%	609	68%
Not answered	99	16%	7	1%
Other	0	-	10	1%
<b>Total</b>	<b>609</b>		<b>900</b>	

There is probably little change in the figures shown in Table 3.27 as, if the 16% of cases where no answer was given are assumed to be deaths, the percentages would be approximately equal. Any conclusions drawn are only as good as the data submitted.

Table 3.28: Postoperative complications  
(Answers may be multiple)

Complications	1998/99 (1518 cases)		1990 (2558 cases)	
Respiratory	462	30%	847	33%
Cardiac failure (IHD/arrhythmia/cardiac arrest)	540	36%	796	31%
Renal failure	249	16%	574	22%
Generalised sepsis	217	14%	349	14%
Stroke or other neurological problems	140	9%	281	11%
Postoperative haemorrhage/bleeding requiring transfusion	103	7%	266	10%
Nutritional problems	76	5%	160	6%
Other organ failure	48	3%	151	6%
Wound infection/dehiscence/fistula	46	3%	166	6%
Thromboembolic	43	3%	129	5%
Hepatic failure	36	2%	141	6%
Urinary tract infection/retention	27	2%	131	5%
Anastomotic failure	26	2%	54	2%
Peripheral ischaemia	24	2%	88	3%
Endocrine failure	14	1%	32	1%
Pressure sores	13	1%	73	3%
Problems with analgesia	10	1%	34	1%
Prosthetic complication	4	<1%	9	<1%
Fat embolus	2	<1%	2	<1%
Other	7	<1%	338	13%

Cardiorespiratory problems remain the most common postoperative complication in patients who die. Whilst the percentages for other complications may vary, the general order remains similar with renal failure, sepsis and neurological complications being the next most common.

Table 3.29: Personnel shortages  
(Answers may be multiple)

Personnel	1998/99 (22 cases)		1990 (121 cases)	
Consultant surgeons	3	14%	5	4%
Trainee surgeons	1	5%	13	11%
Consultant anaesthetists	2	9%	25	21%
Trainee anaesthetists	1	5%	11	9%
Skilled assistants	2	9%	19	16%
Nurses	11	50%	32	26%
Operating department assistants	-	-	32	26%
Porters	-	-	22	18%
Other	3	14%	12	10%

**Question 3.12: Was there a shortage of personnel in this case?**

	1998/99		1990	
Yes	22	1%	121	5%
No	1313	87%	2437	95%
Not answered	183	12%	0	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

Whilst the problem of staff shortages appears overall to be less in 1998/99, the type of staff involved has changed, as shown in Table 3.29.

Table 3.29 shows a reported increasing shortage of consultant surgeons, which is interesting. This could reflect the recognition that a consultant is needed for the case, that trainees are less experienced, a specialist is needed or that the consultants are overworked or too few in numbers to cover the workload.

There has also been a significant increase in the shortage of nursing staff.

## AUDIT

**Question 3.13: Has this death been considered, or will it be considered, at a local audit/quality assurance meeting?**

	1998/99		1990	
Yes	1140	75%	1635	64%
No	313	21%	403	16%
Not answered	57	4%	520	20%
Not known	8	<1%	-	-
<b>Total</b>	<b>1518</b>		<b>2558</b>	

In the 1990 data, 64% of all deaths were considered at an audit meeting whereas the percentage in the 1998/99 data was 75%. In addition, there has been a marked improvement in the completion of this question. Whereas in 1990 20% of respondents either could not or would not answer this question, the latest figure has fallen to 4%. Clearly the profession has moved a long way (with

administrative support) and now embraces audit within the working week. However, the use of audit varies amongst specialties, as shown in Figure 3.5.

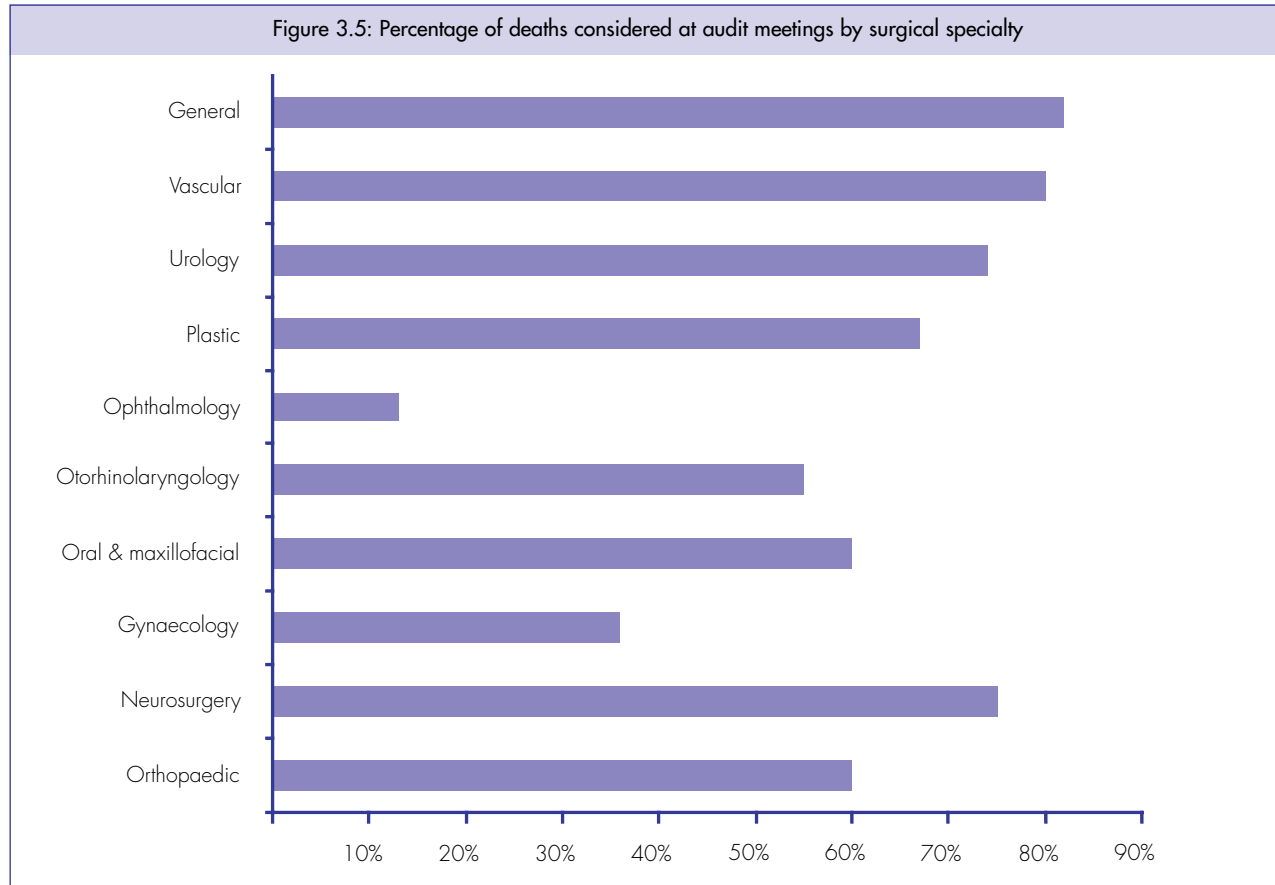
There are issues around these variations for individual specialties and departments to address and justify, especially in the light of clinical governance.

**Question 3.14: Has the consultant surgeon seen and agreed this questionnaire?**

Yes	1403
No	49
Not answered	66
<b>Total</b>	<b>1518</b>

A small percentage of consultants (3%, 49/1518) do not check the content of the completed questionnaire. Even when the questionnaires are checked before return, there are omissions and verifiable inaccuracies. Perhaps the time is approaching when it will be necessary to audit the accuracy of completion of NCEPOD questionnaires.





# SPECIFIC ISSUES AND SURGICAL SPECIALTIES

## CONSENT

### Key Points

- *Consent was frequently obtained by pre-registration house officers and senior house officers for complex surgical procedures, where death was anticipated.*
- *Clinicians must be aware of their legal obligations concerning consent.*

### Introduction

For the first time, this year's enquiry asked questions about consent. These will become increasingly important in future samples as the effects of the recent GMC guidance<sup>45</sup> begin to be seen.

In 30 cases consent had definitely not been obtained prior to operation. In a further 54 cases there was no evidence that consent had been obtained, as either the question was not answered or the answer was not known by the person completing the questionnaire.

The majority of cases were classified as emergency or urgent (Figure 3.6).

All of this group of patients had either life threatening conditions requiring immediate surgery, or were extremely ill, and possibly legally incompetent to give consent. All patients undergoing scheduled or elective surgery without consent were recorded as having psychiatric or neurological illness, which may have rendered them incompetent to give consent.

The over-riding legal and professional duty to a patient is to act in good faith and in the best interest of the patient. Where the patient's life is at risk, a doctor may operate without the consent of the patient, provided that he does so in the patient's best interest, and provided that no indication was given by the patient in advance (advance directives) that they would not consent to surgery.

If an adult patient is judged to be incompetent (and that is a matter to be determined by the treating clinician), then no other person may give or withhold consent for a procedure. The doctor must act in the patient's best interest; however, if time permits, consultation with relatives and carers is good practice, provided the patient has not previously indicated a desire for confidentiality.

Where the clinician is in doubt, and where time permits, application may be made for a direction to be issued by the High Court.

Figure 3.6: Classification of operation when no consent was obtained prior to surgery

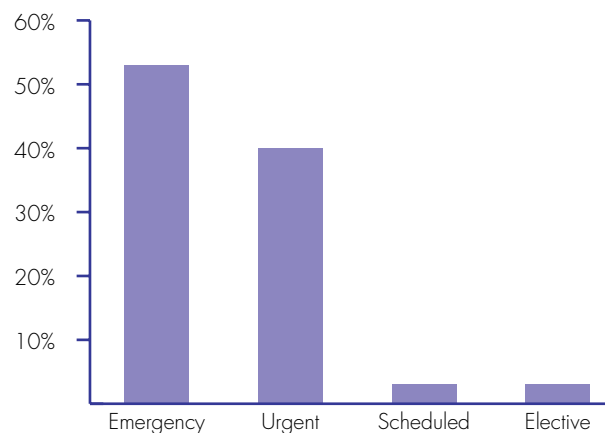
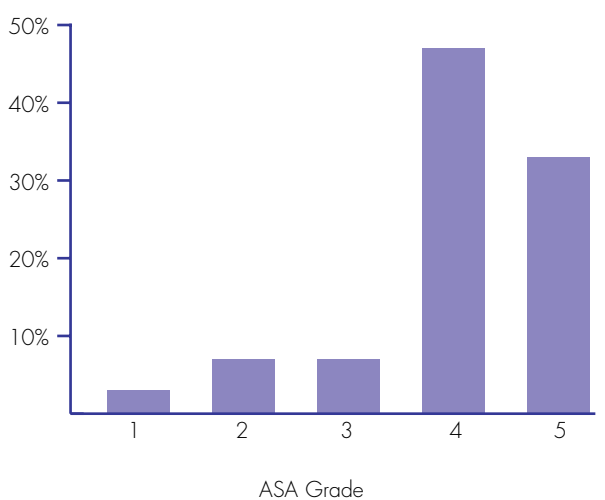


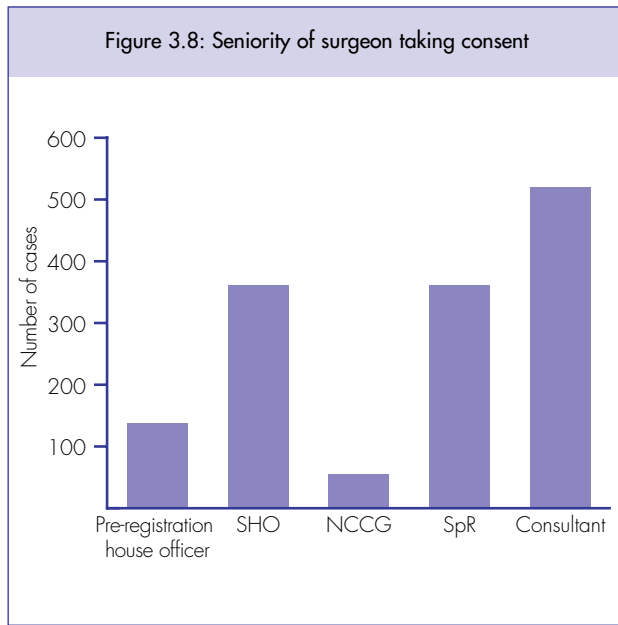
Figure 3.7: ASA classification when no consent was obtained prior to surgery



## Was the surgeon who obtained consent present at the operation?

Of the 1434 cases in which consent was definitely obtained prior to operation, in 399 (28%) the surgeon obtaining consent was not present at the operation.

### Seniority of surgeon taking consent



Consent was taken by pre-registration house officers and SHOs in 498 (33%) cases for a wide range of complex surgical procedures. It is likely that in most cases the procedures will have been discussed in detail by a senior member of the surgical team prior to operation. It is important, however, that salient details of the discussions that take place prior to surgery between senior staff and the patient are recorded in the notes.

It is important that the clinician obtaining consent from the patient fully understands the nature of the procedure proposed, the likelihood of complications arising, and is capable of answering questions asked by the patient. Furthermore, for consent to be valid, the risks of particular relevance to the individual patient must be discussed and complication rates must take account not only of published rates but also of the operating surgeon's own outcomes<sup>46</sup>.

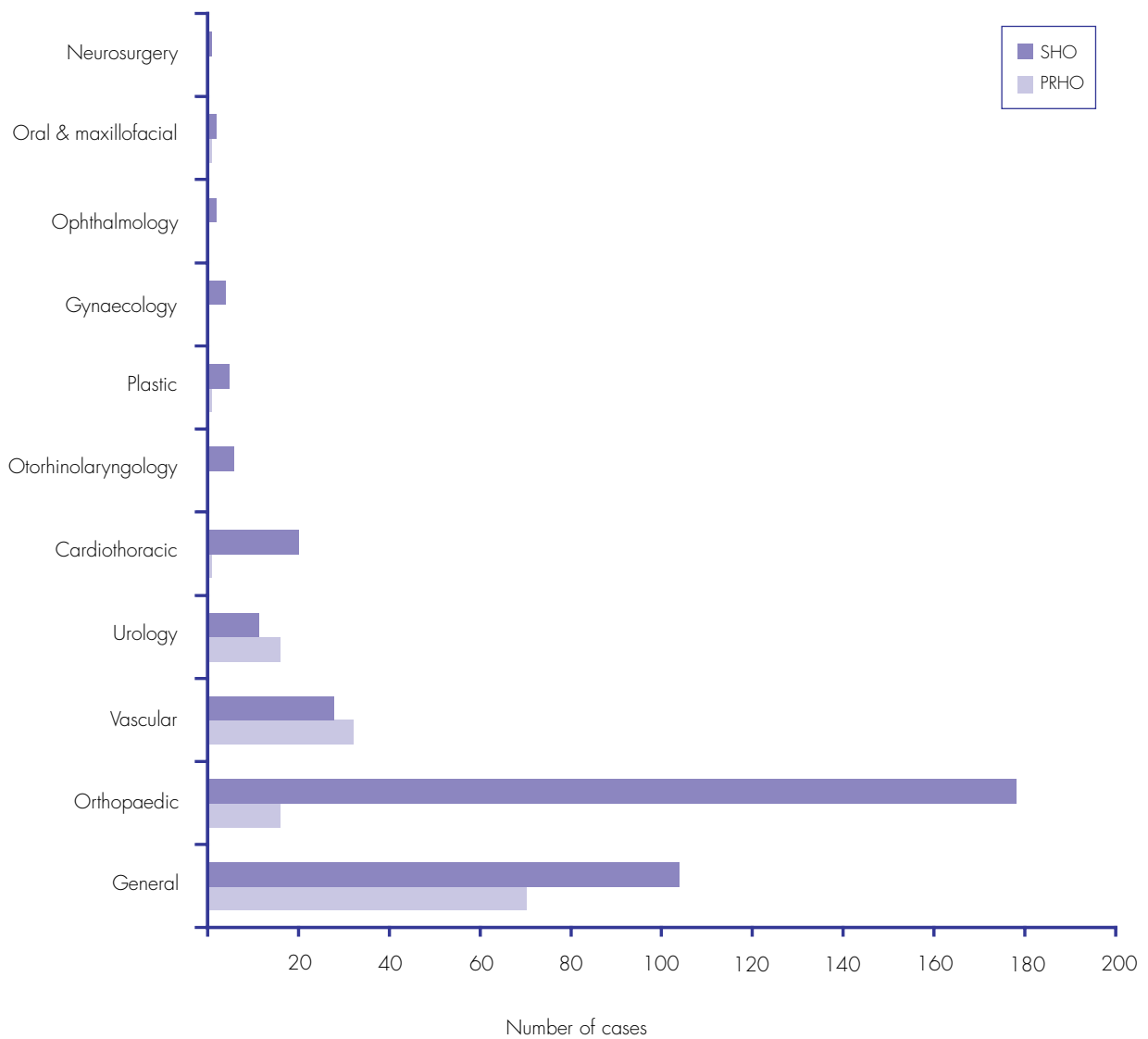
The GMC has recently issued the following guidance<sup>45</sup>:

*"If you are the doctor providing treatment or undertaking an investigation, it is your responsibility to discuss it with the patient and obtain consent, as you will have a comprehensive understanding of the procedure or treatment, how it is carried out, and the risks attached to it. Where this is not practicable, you may delegate these tasks provided you ensure that the person to whom you delegate*

- *Is suitably trained and qualified;*
- *Has sufficient knowledge of the proposed investigation or treatment, and understands the risks involved;*
- *Acts in accordance with the guidance in this booklet."*

Of the patients for whom consent was obtained by SHOs or pre-registration house officers, 273 were regarded as having definite risk of death or of death being expected. Is it appropriate for inexperienced house officers to be obtaining consent for complex surgical procedures where there is a significant possibility of death?

Figure 3.9: Consent taken by pre-registration house officer (PRHO) or senior house officer (SHO) by specialty



## CARDIOTHORACIC SURGERY

### Key Points

- *Waiting lists for cardiac surgery remain unacceptably long.*
- *Patients continue to have operations cancelled due to lack of ICU beds.*
- *Consultant input is even greater than it was in 1990. Almost all urgent or emergency operations were performed by consultants.*
- *An increased number of patients were admitted as emergencies and were of poor physical status.*
- *A higher proportion of deaths were discussed at audit meetings.*

### Introduction

As with other specialties cardiothoracic surgery is being compared with the data presented in the 1990 NCEPOD report<sup>4</sup>. The number of cases in the 1998/99 sample is smaller, being 10% of the total deaths reported, compared to the 20% sample reviewed in 1990. In 1999 the Society of Cardiothoracic Surgeons of Great Britain and Ireland published the results of an audit of adult cardiac operations performed in 1998<sup>47</sup>. The number of deaths included in the NCEPOD sample is smaller than in this audit; this is due to the exclusion of Scotland and the Irish Republic, likely under-reporting of deaths from some hospitals and a return rate of questionnaires of 78%. Reporting and return rates are expected to continue to improve as clinical governance takes effect.

Cardiothoracic surgery as a specialty collects better data and has been subject to more internal scrutiny than perhaps any other specialty<sup>48</sup>. Audit has shown a steady improvement in results for coronary surgery during the period from 1993-98<sup>47</sup>, despite the fact that there has been an increase in the number of operations on older patients. It is ironic, therefore, that the specialty should have had such adverse publicity in recent years.

As in 1990, there was a very high level of input from consultants, both in the decision to operate and in the person performing the actual operation. Some operations were performed by trainees indicating that training is in progress; these were all on scheduled or elective patients, with the emergencies being performed by consultants.

### Cardiac surgery

Table 3.30: Procedures in cardiac surgery

Procedure	Number
Coronary artery bypass grafting (CABG)	23
CABG + carotid endarterectomy	1
CABG + mitral valve replacement	3
CABG + repair of LV aneurysm	2
CABG + repair of ascending aorta	1
CABG + repair of VSD	3
CABG + aortic valve replacement	2
Redo CABG	5
Redo CABG + mitral valve replacement	1
Redo CABG + repair of LV aneurysm	1
Aortic valve replacement	6
Redo aortic valve replacement	2
Mitral valve replacement	3
Redo mitral valve replacement	2
Aortic and mitral valve replacement	1
Mitral and tricuspid valve replacement	1
Replacement of aortic root	2
Replacement of ascending aorta	3
Replacement of descending aorta	1
ASD	1
Reopening after CABG	1
Formation of pericardial window	1
Insertion of LV assist device	1
<b>Total</b>	<b>67</b>

## Age

Table 3.31 compares the age of patients in 1998/99 with those in 1990. Forty-three percent of the patients in the 1998/99 sample were aged 70 years or over, as compared with 21% in 1990. Children aged ten years or under were excluded from the 1990 sample. There were nine cardiothoracic procedures in children aged ten years or under in the 1998/99 sample and these have been included in the paediatric surgery section of this report (see page 105).

Age in years	1998/99		1990	
11-19	0	-	3	3%
20-29	1	2%	2	2%
30-39	0	-	3	3%
40-49	4	6%	14	14%
50-59	10	15%	19	18%
60-69	23	34%	40	39%
70-79	22	33%	18	17%
80-89	7	10%	4	4%
<b>Total</b>	<b>67</b>		<b>103</b>	

## Sex

The distribution between the sexes has remained unchanged since 1990, with the female to male ratio being 1:1.7, reflecting the higher incidence of ischaemic heart disease in males.

## Admission category

Admission category	1998/99		1990	
Elective	29	43%	64	62%
Urgent	16	24%	18	17%
Emergency	21	31%	21	20%
Not known	1	1%	0	-
<b>Total</b>	<b>67</b>		<b>103</b>	

Many operations continue to be performed electively, although the proportion done urgently or as an emergency has increased since 1990.

## Delay, cancellation and transfer

There was a delay in performing the operation in 13/67 (19%) cases. In 1990 there were 16/103 (16%) reported delays in admission due to lack of resources.

Reason	Number
<i>Elective operations:</i>	
Long waiting list (up to 14 months cited)	8
No ICU bed (cancelled twice)	1
Surgeon to whom patient referred was on leave; referred to a second surgeon whose lists were full	1
Difficulty in funding a patient who was not entitled to NHS treatment	1
<i>Emergency operations:</i>	
Time taken for perfusionist and anaesthetist to get to hospital	1
Patient had a cardiac arrest requiring ventilation and stabilisation	1

NCEPOD has no information regarding patients who may have died while on long waiting lists.

Two patients had had their operations cancelled on a previous occasion; one because there was no ICU bed and the other because there was a need for carotid Dopplers to be performed.

Forty-two percent (28/67) of patients were transferred as an inpatient from another hospital, compared to 34% (35/103) in 1990. This is not surprising as cardiac surgery is practiced in regional or subregional centres.

## Coexisting medical disorders

Table 3.34: Coexisting medical disorders (other than the main diagnosis)  
(Answers may be multiple)

Coexisting disorder	1998/99 (67 cases)		1990 (103 cases)	
	Cases	%	Cases	%
Cardiac	21	31%	61	59%
Renal	17	25%	21	20%
Respiratory	16	24%	19	18%
Diabetes	9		*	
Neurological	7		9	
Gastrointestinal	5		5	
Vascular	5		*	
Other endocrine	5		7	
Malignancy	3		*	
Sepsis	3		*	
Haematological	1		2	
Musculoskeletal	1		5	
Psychiatric	1		1	
Other	0		10	
None	21		17	
Not known	1		1	

\* Not a separate category in 1990 question

There appears to have been a relative rise in respiratory and renal problems, but a relative fall in cardiac disorders other than the condition requiring surgery.

### ASA status

Table 3.35 and Figure 3.10 show that 60% of the patients who died were ASA grade 4; this compares to 45% in this category in 1990.

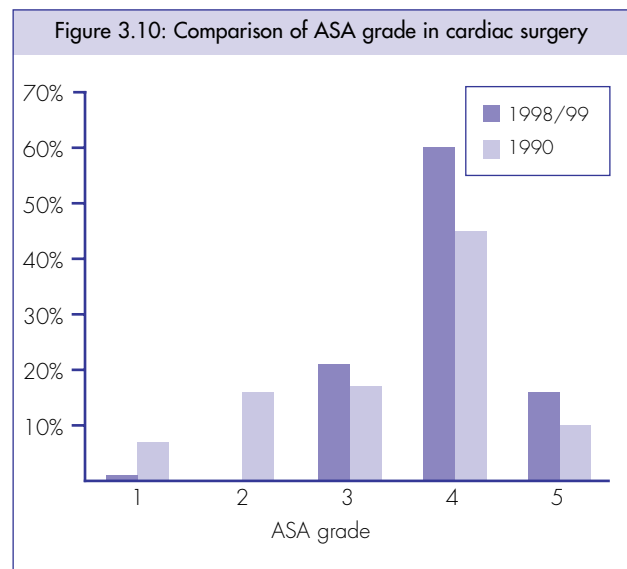


Table 3.35: ASA status by classification of operation

Classification	ASA 1		ASA 2		ASA 3		ASA 4		ASA 5		Total	
	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990
Emergency	0	0	0	0	0	1	6	8	10	10	16	19
Urgent	0	1	0	1	2	0	14	12	1	0	17	14
Scheduled	1	4	0	6	5	14	14	21	0	0	20	45
Elective	0	3	0	9	7	3	6	5	0	0	13	20
<b>Total</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>16</b>	<b>14</b>	<b>18</b>	<b>40</b>	<b>46</b>	<b>11</b>	<b>10</b>	<b>66*</b>	<b>98**</b>

\* In one elective case the ASA grade was not known.

\*\* In five cases the ASA grade or classification of operation was not known.

## The surgeon

Grade	1998/99	1990
Consultant	67	100
Senior registrar	-	1
Associate specialist	0	2
<b>Total</b>	<b>67</b>	<b>103</b>

A very high level of consultant involvement continues although, in the 1998/99 group, 11 surgeons did not indicate who proposed the operation undertaken; in the remaining 56 cases the consultant made this decision.

Grade	1998/99		1990	
Consultant	59	88%	90	87%
Associate specialist	0	-	2	2%
SpR with CCST/SR	2	3%	10	10%
SpR 4 or greater	4	6%	Not applicable	
SpR 3/Registrar	1	1%	1	1%
SpR 2	1	1%	Not applicable	
<b>Total</b>	<b>67</b>		<b>103</b>	

Grade	Emergency		Urgent		Scheduled		Elective		Total	
	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990
Consultant	15	19	17	12	16	43	11	16	59	90
Associate specialist	0	0	0	0	0	1	0	1	0	2
SpR with CCST/SR	1	1	0	5	0	1	1	3	2	10
SpR 4 or greater	0	-	0	-	3	-	1	-	4	-
SpR 3	0	-	0	-	1	-	0	-	1	-
SpR 2	0	-	0	-	1	-	0	-	1	-
<b>Total</b>	<b>16</b>	<b>20</b>	<b>17</b>	<b>17</b>	<b>20</b>	<b>45</b>	<b>14</b>	<b>20</b>	<b>67</b>	<b>102*</b>

\* One case in 1990 was performed by a registrar but the operation was not classified.

Table 3.38 shows that once again the overwhelming majority of operations were performed by consultants. In 1990, six out of 37 emergency and urgent cases were performed by senior registrars, whereas now only one out of 33 such cases was performed by a surgeon below consultant grade and this was by an SpR with a CCST. Trainees are, therefore, being taught cardiac surgery on the planned rather than the emergency cases. This is reassuring but raises the issue of SpRs not being adequately trained in emergency surgery on achieving consultancy. There is other evidence to support this<sup>49</sup>.

### Postoperative complications

These were remarkably similar to those identified in 1990.

### Audit

Ninety-three percent (62/67) of cases were considered at a local audit meeting. This commendably high figure is a great improvement on the 68% recorded in 1990.



## Thoracic surgery

Table 3.39: Procedures in thoracic surgery

Procedure	Number
Bronchoscopy	2
Bronchoscopy + oesophagoscopy	1
Bronchoscopy + lung biopsy	1
Bronchoscopy + lobectomy	1
Bronchoscopy + pneumonectomy	2
Pneumonectomy	2
Lobectomy	4
Tracheostomy	2
Rigid oesophagoscopy	1
Oesophagoscopy + dilatation and stent	3
Repair of oesophageal tear and removal of foreign body	1
Lung volume reduction	1
Stapling of bulla	1
Stapling of bulla + closure of bronchopleural fistula	1
Pleurectomy + closure of air leaks	1
Pleural biopsy + talc pleuradesis	3
Cervical mediastinoscopy	1
Pulmonary thromboendarterectomy	1
Reopen, resection necrotic stomach + fistula in neck	2
Thoracotomy + evacuation of clot	2
Mini laparotomy + splenectomy	1
<b>Total</b>	<b>34</b>

### Age

Table 3.40 shows the age of those who died, compared to 1990 data. The numbers are small, but there does seem to have been an increase in the number of patients aged over 70 years having operations.

Table 3.40: Age of patient at time of final operation

Age in years	1998/99		1990	
11-20	0	-	1	2%
21-30	0	-	1	2%
31-40	1	3%	0	-
41-50	2	6%	3	7%
51-60	5	15%	3	7%
61-70	13	38%	24	59%
71-80	11	32%	8	20%
81-90	2	6%	1	2%
<b>Total</b>	<b>34</b>		<b>41</b>	

### Admission category

There has been an increase in the proportion of emergency operations among those who died.

Table 3.41: Admission category

Admission category	1998/99		1990	
Elective	17	50%	26	63%
Urgent	9	26%	11	27%
Emergency	7	21%	4	10%
Not answered	1	3%	0	-
<b>Total</b>	<b>34</b>		<b>41</b>	

### Delay, cancellation and transfer

Three patients had their operations delayed; two because the waiting list was too long and one had a delayed transfer because no bed was available on the surgical ward.

None of the thoracic patients had their operation cancelled for a non-clinical reason.

Thirty-five percent (12/34) of the patients were transferred from other hospitals.

### Coexisting medical disorders

Table 3.42: Coexisting medical disorders (other than main diagnosis) (34 cases; answers may be multiple)

Coexisting disorder	Number
Cardiac	14
Respiratory	12
Malignancy	8
Sepsis	4
Vascular	3
Diabetes	3
Renal	2
Haematological	2
Neurological	1
Other endocrine	1
Psychiatric	1
None	8

These complications are similar to those seen in 1990, with cardiorespiratory problems being predominant.

## ASA status

Table 3.43: ASA status by classification of operation

Classification	ASA 1		ASA 2		ASA 3		ASA 4		ASA 5		Total	
	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990
Emergency	0	0	1	1	0	0	2	2	2	3	5	6
Urgent	0	0	0	1	3	1	8	2	1	0	12	4
Scheduled	0	3	4	9	7	3	3	7	0	1	14	23
Elective	0	1	0	4	3	2	0	0	0	0	3	7
<b>Total</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>15</b>	<b>13</b>	<b>6</b>	<b>13</b>	<b>11</b>	<b>3</b>	<b>4</b>	<b>34</b>	<b>40*</b>

\* One scheduled case had no ASA grade recorded.

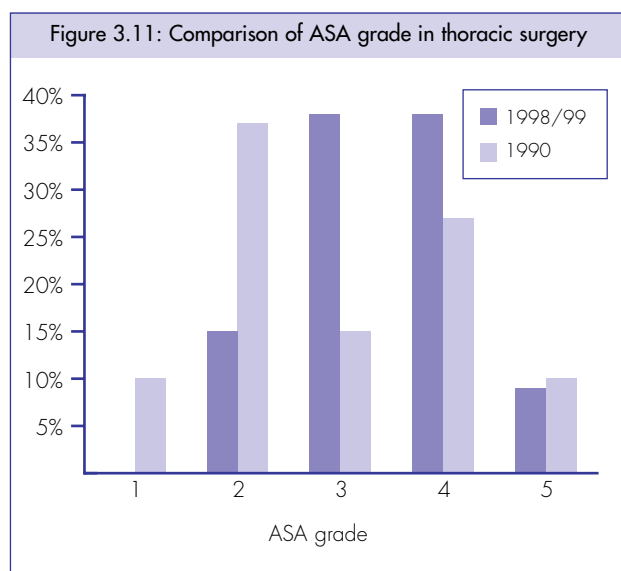


Table 3.43 and Figure 3.11 show that 76% (26/34) of patients in 1998/99 were graded ASA 3 or 4; this compared to 41% in 1990.

### The surgeon

In all 34 cases a consultant was consulted before the operation. This is an improvement since 1990, when a consultant made the diagnosis in 35/41 (85%) patients.

Table 3.44: Grade of the most senior operating surgeon

Grade	1998/99		1990	
	Count	Percentage	Count	Percentage
Consultant	24	71%	31	76%
Staff grade	1	3%	0	-
Senior registrar	Not applicable		4	10%
SpR 4 or greater/Registrar	5	15%	6	15%
Visiting SpR	2	6%	Not applicable	
Not answered	2	6%	0	-
<b>Total</b>	<b>34</b>		<b>41</b>	

Table 3.45: Grade of most senior operating surgeon by classification of operation

Grade	Emergency		Urgent		Scheduled		Elective		Total	
	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990
Consultant	5	6	7	3	9	16	3	6	24	31
Staff grade	0	0	0	0	1	0	0	0	1	0
Senior registrar	-	0	-	1	-	3	-	0	-	4
SpR 4 or greater/Registrar	0	0	3	0	2	5	0	1	5	6
Visiting SpR (or year unknown)	0	-	0	-	2	-	0	-	2	-
Not answered	0	0	2	0	0	0	0	0	2	0
<b>Total</b>	<b>5</b>	<b>6</b>	<b>12</b>	<b>4</b>	<b>14</b>	<b>24</b>	<b>3</b>	<b>7</b>	<b>34</b>	<b>41</b>

As in 1990, all the emergency cases were performed by consultants. In the urgent and scheduled cases a number were done by an SpR 4 or visiting SpR, and one case by a staff grade.

### *Postoperative complications*

Table 3.46: Postoperative complications (34 cases; answers may be multiple)

Complication	Number
Respiratory	17
Generalised sepsis	8
Cardiac arrest	5
Renal failure	4
Postoperative haemorrhage/bleeding requiring transfusion	3
Cardiac failure (IHD/arrhythmia)	3
Nutritional problems	2
Anastomotic failure	1
Problems with analgesia	1
Thromboembolic	1
Other	1
None	11

These are very similar to the complications identified in the 1990 report.

### *Audit*

Eighty-two percent (28/34) of cases were considered at a local audit meeting. This shows some improvement on the 61% (25/41) reported in 1990.

## GENERAL SURGERY

### Key Points

- *There has been an increase in emergency admissions compared to 1990.*
- *The ability to do an operation is not an indication for surgery.*
- *Consultants are undertaking some major operations when there is no hope of cure and without defining the aims of the procedure.*
- *If a surgeon firmly believes that surgery is contraindicated, he/she should decline to operate. A second opinion can always be sought.*
- *Endoscopy for gastrointestinal (GI) bleeding may be difficult. There needs to be experienced endoscopy cover 24 hours per day in hospitals that receive and treat patients with GI haemorrhage. This is an area for collaboration with other disciplines, such as medical gastroenterology.*
- *Some examples of apparent breakdown in teamwork were identified. Surgeons and anaesthetists should ensure that good professional working relationships are maintained in the current climate of clinical practice.*

### Introduction

A total of 639 deaths were reviewed in this year's 10% sample compared with 1188 deaths in 1990 (based on a sample of 20% of all deaths). Data relating to general surgery in the 1990 report<sup>4</sup> were subdivided by procedure and not all pieces of information were reported; for the purposes of comparison with the current data, the old 1990 data have, where possible, been aggregated.

The two samples are broadly similar in terms of age and sex. However, 70% of patients (445/639) were aged between 70 and 100 years in this sample, compared with 64% (766/1188) in the 1990 group. This increase in age mirrors the difference between 1990 and 1998/99 seen in the overall surgical sample. The male to female ratio was 1:1.2 in the current sample and 1:1.1 in 1990.

### Procedures

The procedures performed in each of the seven groups are shown in Tables 3.47 to 3.53; these groups are identical to those used in the 1990 report. The groups were loosely created on the basis of pathology or procedures; this subdivision of general surgery has been retained in order to allow some comparison although a broader overview is also taken. Due to differences in sampling and changes in clinical practice no specific comparisons can be made concerning the individual procedures which resulted in death. The reader is referred to the 1990 NCEPOD report for in-depth comments on the subgroups<sup>4</sup>.

Table 3.47: Procedures in oesophageal surgery  
(May be multiple in any one patient)

Procedure	Number
Oesophagectomy (all approaches for malignant disease)	7
Procedures for oesophageal varices	4
Endoscopic dilatation and intubation (malignancy)	3
Oesophagoscopy and dilatation of stricture	2
Miscellaneous (one each of: laser resection of oesophageal tumour, open insertion of oesophageal tube, unblocking of stent, oesophagostomy, gastrostomy)	5

Table 3.48: Procedures in abdominal surgery  
(May be multiple in any one patient)

Procedure	Number
'Open and shut' laparotomy, for widespread malignancy or acute mesenteric ischaemia	72
Small bowel resection (all causes)	38
Oesophagogastroduodenoscopy	26
Gastroenterostomy	23
Laparotomy for adhesive obstruction	20
Feeding jejunostomy	14
Partial gastrectomy for carcinoma	13
Drainage of intra-abdominal abscess (all sites)	8
Resuturing of abdominal wound dehiscence	7
Splenectomy	6
Enteroenterostomy for malignant obstruction	6
Removal of packs	4
PEG insertion	4
Total gastrectomy	4
Laparotomy for multiple trauma/haemorrhage	4
Laparotomy for malignant obstruction	3
Laparostomy	3
Diagnostic laparoscopy (with or without biopsy)	3
Drainage of ascites	3
Gastrostomy	2
Laparoscopic fundoplication	2
Miscellaneous (one each of: removal of CAPD catheter, repair gastrojejunal fistula, second look laparotomy, repair duodenum)	4

When compared to the 1990 data, exploratory laparotomy, mainly for undiagnosed mesenteric ischaemia or intra-abdominal malignancy, remains the most common procedure within this group (Table 3.48). This is perhaps surprising but there is still no specific diagnostic test for acute mesenteric ischaemia. In addition, limitations within the resourcing of the health service and the availability of investigative techniques and imaging often mean that a laparotomy is the most expeditious means of arriving at a diagnosis. Is this in the best interests of the patient?

**CASE 3** • An 81-year-old patient had a diagnostic laparotomy. He was known to suffer from COPD, ischaemic heart disease and chronic renal failure. No preoperative diagnostic tests or imaging were carried out. At laparotomy multiple metastases were found and no procedure performed. He died within 24 hours of surgery.

**CASE 4** • A 73-year-old patient was referred with an acute abdomen from a medical specialty. She had been in hospital for four days. After suitable resuscitation an SpR 4 performed a laparotomy after discussion with the consultant surgeon. Extensive mesenteric infarction was found and the abdomen closed. The surgeon commented that the clinical findings were not clear cut and that he had operated as soon as the resuscitation was effective.

There were seven cases where the abdomen was resutured after a dehiscence (Table 3.48). In this sample, when compared to the 1990 data (four cases), there appears to have been an increase in this procedure, despite changes in techniques and suture materials.

Table 3.49: Procedures for complications of peptic ulcer disease  
(May be multiple in any one patient)

Procedure	Number
<i>Bleeding gastric ulcer:</i>	
Under-running of bleeding ulcer	4
Excision of bleeding ulcer	2
Partial gastrectomy	1
<i>Perforated gastric ulcer:</i>	
Simple closure	10
<i>Bleeding duodenal ulcer:</i>	
Under-running of bleeding ulcer	13
Truncal vagotomy and pyloroplasty	2
Pyloroplasty only	2
<i>Perforated duodenal ulcer:</i>	
Oversewing and/or omental patch	23
<i>Stomal ulcer:</i>	
Oversewing	1

Within the sample of deaths following upper gastrointestinal haemorrhage there were examples of poor management and failure to adhere to published guidelines<sup>50</sup>. As this area appears to be of concern there is a case for reviewing these guidelines, revising them if necessary and ensuring that they receive a wide circulation. Perhaps this subject could be encompassed within the agenda for NICE.

**CASE 5** • A 97-year-old patient presented with a gastrointestinal haemorrhage and haematemesis. She was apparently under the care of a medical gastroenterology unit. However, a surgical registrar (SpR 4) was left to perform an endoscopy in theatre at 23.00. All he found was 'blood in the stomach'. The patient continued to bleed and died four days later.

These arrangements for the investigation of gastrointestinal haemorrhage could be much improved.

**CASE 6** • An 80-year-old ASA 5 patient had a haematemesis. Without preoperative endoscopy a surgical registrar (SpR 4) in a university hospital operated and attempted to oversew a bleeding duodenal ulcer. An incidental small bowel resection was performed but the reason is unknown, as the operation note was not returned. The patient died the same day.

Preoperative endoscopy might have allowed a rational policy of management to be formulated. The initial endoscopic management of gastrointestinal (GI) haemorrhage is to exclude oesophageal varices. Often an ulcer can be injected with adrenaline or sclerosant to arrest haemorrhage without recourse to surgery.

There is a widespread lack of proper facilities for emergency endoscopy. This is not entirely a surgical problem and needs a collaborative approach between physicians and surgeons. Endoscopy for GI bleeding may be difficult and requires an expert endoscopist supported by an endoscopy team. This cover is needed 24 hours per day. Emergency endoscopy should not be left to a surgical trainee, often working in an operating theatre where the necessary support and equipment are not available.

In the previous report no deaths were reviewed following laparoscopic procedures, as this technique was in its infancy at that time. In the current sample (Table 3.50) there were five deaths related to laparoscopic surgery (three following an initial laparoscopic cholecystectomy, which was converted to an open procedure, and two following a laparoscopic procedure alone). When the procedure is not going well the surgeon should summon help or convert to an open operation. The problems highlighted in case 7 were not only technical but also concerned communication.

**CASE 7** • An 83-year-old patient had a laparoscopic cholecystectomy performed by an experienced SpR in a university hospital. The procedure was difficult due to adhesions and, therefore, the surgeon converted the approach to an open cholecystectomy. There was no appeal for senior help. The following day there was evidence of a biliary leak and attempts were made to drain the common bile duct by an ERCP and then a percutaneous approach; both failed. Intra-abdominal bleeding commenced. Two further laparotomies were performed for haemoperitoneum and haemobilia. Embolisation was also attempted but the patient died from haemorrhage on the 24<sup>th</sup> postoperative day. A postmortem identified a torn common bile duct but could not identify the source of bleeding.

Table 3.50: Procedures in hepatopancreaticobiliary surgery  
(May be multiple in any one patient)

Procedure	Number
Open cholecystectomy (conversion from laparoscopic procedure)	12 (3)
Bypass surgery for malignant obstructive jaundice	5
ERCP and insertion of biliary stent	4
Pancreaticoduodenectomy	3
Pancreatic necrosectomy	3
Laparoscopic cholecystectomy	2
Cholecystostomy	2
Liver biopsy	2
Exploration of common bile duct	2
Miscellaneous (one each of: drainage of peripancreatic collection, revision of cholecystenterostomy, choledochoduodenostomy, packing of liver for trauma)	4

**Table 3.51: Procedures in colorectal surgery**  
(May be multiple in any one patient)

Procedure	Number
Hartmann's procedure	63
Right hemicolectomy	52
Anterior resection of rectum	21
Sigmoid colectomy	17
Defunctioning ileostomy	17
Sigmoid colostomy (all types, including one laparoscopic procedure)	16
Transverse colostomy	11
Ileotransverse bypass	9
Abdominoperineal excision of rectum	8
Appendectomy	8
Left hemicolectomy	6
Colonoscopy/flexible sigmoidoscopy	6
Rigid sigmoidoscopy	5
Transverse colectomy	5
Total colectomy +/- ileorectal anastomosis	4
Total colectomy and ileostomy	4
EUA rectum	3
Closure of ileostomy	2
Transabdominal rectopexy	2
Caecostomy	2
Miscellaneous (one each of: dilatation of rectal stricture, correction of sigmoid volvulus, repair of caecal perforation, repair of sigmoid perforation, perianal excision of villous adenoma, closure of colostomy, refashioning of colostomy, refashioning of ileostomy)	8

In the 1990 report a right hemicolectomy was the most frequent procedure preceding death in this group. Although a Hartmann's procedure was more common in the current group, a right hemicolectomy is still high in the table. NCEPOD has previously commented that a right hemicolectomy is a more dangerous procedure than is perceived<sup>11</sup>.

**Table 3.52: Procedures in hernia surgery**  
(May be multiple in any one patient)

Procedure	Number
Strangulated femoral hernia repair (all approaches +/- small bowel resection)	17
Obstructed incisional hernia repair	6
Strangulated inguinal hernia repair (+/- small bowel resection)	3
Uncomplicated elective inguinal hernia repair	3
Paraumbilical hernia repair	3
Recurrent inguinal hernia repair	2
Miscellaneous (one each of: parastomal hernia repair and release of internal abdominal hernia)	2

Surgery for strangulated femoral hernia remains the most frequent hernia-related procedure associated with death.

Table 3.53: Miscellaneous primary procedures in general surgery  
(May be multiple and/or coincidental with other procedures in any one patient)

Procedure	Number
Drainage of abscess (excluding abdomen)	4
Biopsy of tumour mass (excluding abdomen)	4
Partial cystectomy	4
Debridement of wound	3
Oophorectomy	3
Tracheostomy	3
Excision biopsy of lymph node (all sites)	3
Repair of major arterial trauma	3
Insertion of intercostal drain	2
Miscellaneous (one each of: toilet mastectomy and chest wall reconstruction, cadaver renal transplant, excision breast lump, fasciotomy, desloughing pressure sore, suture scalp wound, orchidectomy, hysterectomy, manual evacuation of rectum, insertion of central venous catheter, insertion of Hickman line)	11

## Admission category

In 1990, 55% of the admissions were emergencies; this figure is now 71% (453/639). This reflects the general increase in emergency admissions which most surgical specialties are experiencing (see also section on orthopaedic surgery, page 102). This increasing unplanned load on services, beds etc. requires careful analysis, planning and resourcing.

## Shared care

Given the high level of emergency admissions, there may be little time to organise consultations and the formal involvement of physicians etc. Indeed, only 22% (139/639) of these patients were managed jointly. This is a very similar figure to that of the overall surgical data (25%) for 1998/99 and to the data for 1990 (28%, although this was only collected for oesophageal surgery and a few miscellaneous procedures). Anaesthetists are familiar with the immediate requirements of ill patients awaiting urgent general surgical procedures and shared care may have less relevance here than in other specialties, such as orthopaedic surgery, where longer term care and rehabilitation are needed.

## Consultation

Table 3.54: Grade of most senior surgeon consulted before the operation  
(Figures for locums given in brackets)

Grade	Number
Consultant	580 (5)
Associate specialist	9
Staff grade	6
SpR with CCST	6
SpR 4 or greater	17
SpR 3	6
SpR 2	2
SpR 1	3
Visiting SpR or year not known	3 (1)
Premier SHO	1
SHO 1	1
Not answered	5 (1)
<b>Total</b>	<b>639</b>

A consultant, or SpR 4 with a CCST, was consulted in 92% of cases. In 1990, a consultant or senior registrar was consulted in 90% of cases (1066/1188). These figures are in contrast to those for anaesthesia where there was less consultation with a senior member of staff in 1998/99 compared to 1990 (see pages 28,48). Local guidelines should clarify when it is appropriate for a trainee to discuss a patient and their management with a consultant. It might be suspected that trainees are not consulting senior surgeons concerning elderly patients for whom they perceive that nothing can be done; this is not so. In cases where no opinion was sought from a consultant (59 patients), 38 were less than 80 years old and only two patients were aged 90 years or over. In the older patients (>79 years of age) there were no moribund (ASA 5) patients.



## Coexisting medical disorders

Comorbidity was present in 87% of the patients (555/639). Cardiorespiratory problems were most common followed by malignancy and renal disease.

### *ASA status and risk of death*

There has been a shift in the ASA class with an increase in the sicker (ASA 3 and 4) patients compared to 1990 (Figure 3.12).

Surgeons were asked how they assessed the risk for the procedures undertaken, and their responses are shown in Table 3.55.



Risk of death	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Not answered	Not known	Total
Not expected	9	25	17	15	0	0	1	67
Small, significant risk	1	32	58	21	1	3	0	116
Definite risk	3	41	138	174	30	7	1	394
Expected	2	1	11	17	25	0	0	56
Not answered	0	2	4	0	0	0	0	6
<b>Total</b>	<b>15</b>	<b>101</b>	<b>228</b>	<b>227</b>	<b>56</b>	<b>10</b>	<b>2</b>	<b>639</b>

There were 25 cases where the patient was moribund (ASA 5) yet the surgeon operated knowing that death was expected (Table 3.55). The procedures are shown in Table 3.56.

Procedure	Number
'Open and close' laparotomy	5
Hartmann's procedure	4
Surgery for strangulated hernia with bowel resection	3
Suture of perforated peptic ulcer	3
Oversewing of bleeding peptic ulcer	2
Miscellaneous (one each of: diagnostic laparoscopy, pancreatic necrosectomy, anterior resection of rectum, oversewing of gastrojejunal fistula, ligation of subclavian artery, suture of scalp laceration, OGD and sigmoidoscopy)	8
<b>Total</b>	<b>25</b>

In certain cases the question might be 'why operate?' Some procedures were clearly inappropriate. With hindsight some surgeons might have used a different, more conservative, management plan.

## *Inappropriate surgery by consultants in advanced malignancy*

Overall the pattern of inappropriate operating appears to have changed. The problem is no longer one of trainees operating beyond their capability (as was reported in the 1990 report) but rather that of consultants doing radical and inappropriate procedures, simply because they have the ability, without regard for the outcome. Why make heroic attempts to palliate rather than refer to palliative/symptom control teams?

**CASE 8** • A 79-year-old patient with colorectal cancer was treated by a consultant surgeon with an interest in coloproctology. The patient was anaemic and hypoalbuminaemic. A laparotomy was performed and the consultant then proceeded to do a palliative right hemicolectomy, a cholecystectomy and a partial gastrectomy. There was tumour spillage at surgery. There was no HDU bed available and so the patient was held in recovery. Death from respiratory failure occurred five days later. No postmortem was performed.

The advisors questioned the advisability of such radical surgery in an unfit patient.

**CASE 9** • An 85-year-old patient had a left hemicolectomy, partial cystectomy and appendicectomy in order to remove a colonic carcinoma. This was performed by a consultant general surgeon with an interest in vascular surgery. The patient died with cardiac failure three days later.

**CASE 10** • A 59-year-old patient suffered from an advanced carcinoma of the breast and pulmonary metastases. The surgeon was under considerable pressure from the patient's family and agreed, reluctantly, to operate. A radical toilet mastectomy and chest wall reconstruction was performed. The patient died within 30 days from carcinomatosis.

These were massive procedures with no hope of cure although they could possibly have been palliative. Would a lesser procedure have enabled the patients to leave hospital? The aim of the first of these operations is unclear; perhaps it was never defined!

**CASE 11** • A 48-year-old patient presented to an appropriate specialist with a carcinoma of the oesophagus. An initial CT scan suggested inoperability. Preoperative laparoscopy suggested that the lesion was operable. At surgery the tumour was adherent and it was apparent that the extent of disease had been underestimated. A 3-stage oesophagectomy was done together with insertion of a feeding jejunostomy. The surgeon stated that he had left tumour behind. The anastomosis leaked and the patient died with septicaemia seven days later. A postmortem examination revealed widespread malignancy not seen on laparoscopy.

The initial CT scan suggested involvement of adjacent tissues but this can be unreliable. The advisors questioned whether the surgery should have taken place at all. However, the patient was young and resection offered the best chance for palliation. Unfortunately the initial staging was inaccurate.

## Unexpected deaths in patients graded ASA 1 or 2

Table 3.57: Procedures performed on ASA 1 or 2 patients where death was unexpected

ASA 1	Number
Diagnostic laparotomy	1
Appendicectomy	1
Sigmoid loop colostomy	1
Laparoscopic cholecystectomy, converted to open procedure	1
Anterior resection of rectum	1
Flexible sigmoidoscopy	1
Gastrectomy & Roux-en-Y	1
Repair recurrent inguinal hernia	1
Laparotomy and intestinal bypass	1
ASA 2	
Right hemicolectomy	5
OGD	3
'Open & close' laparotomy (with or without biopsy)	3
Biopsy of superficial malignant mass	2
Laparoscopic cholecystectomy, converted to open procedure	2
Colonoscopy	2
Miscellaneous (one each of: repair strangulated femoral hernia, elective repair inguinal hernia, laparoscopic repair hiatus hernia, anterior resection of rectum, sigmoid colectomy, small bowel resection, gastroenterostomy, anal dilatation)	8
Total	34

An area of considerable interest is the fact that 34 patients died after anaesthesia and surgery when they were ASA 1 or 2 and not expected to die (Table 3.55). These procedures are shown in Table 3.57.

### Why did the ASA 1 patients die?

- The laparotomy was for an unsuspected ruptured hepatoma in a 39-year-old patient treated in a DGH by a general surgeon. There was no preoperative investigation and when the laparotomy was performed it took four hours. Death occurred within 24 hours and was said to be due to a combination of renal failure, ARDS and sepsis. A postmortem was not performed. Why did the surgeon not call for more specialist help? Why was there no postmortem to establish the diagnosis?
- The death after appendicectomy in a 38-year-old patient appeared to be due to technical error. A consultant operated, there was 600 ml blood loss and two sutures transfixed a loop of small bowel when the abdomen was closed (shown at postmortem examination). Death was due to streptococcal septicaemia on the fourth postoperative day.

- The patient with a sigmoid colostomy was found to have unexpected carcinomatosis at laparotomy.
- The death after cholecystectomy was due to a myocardial infarction in a patient with a history of angina (i.e. the ASA classification was incorrect).
- Death following the anterior resection was due to septic shock. The patient was obstructed and there was spillage of colonic contents. The original ASA classification is rather optimistic; the anaesthetist classified the patient as moribund, ASA 5. Death occurred the same day.
- The details returned about the patient having a flexible sigmoidoscopy were so inadequate that no comment is possible.
- The patient dying after gastric surgery developed ARDS and gastric bleeding.
- The death after surgery for a recurrent inguinal hernia was in a 90-year-old patient and was due to pneumonia following aspiration of gastric contents.

- The death after laparotomy and intestinal bypass was in an apparently fit 89-year-old patient who presented with intestinal obstruction. At laparotomy widespread carcinomatous seedlings were found to be the cause of the obstruction.

### Preoperative therapy

Most patients had some form of additional therapy to prepare them for surgery but there were 26 instances where the surgeon completing the questionnaire stated that no therapeutic manoeuvres were undertaken prior to surgery. Included within this group were four major colorectal resections, an oesophagogastrectomy and several elective procedures. It seems inconceivable that there were no preoperative preparations. It is more likely that the data submitted are inaccurate.

### Delays

There were 26 instances (4% of the general surgery cases) where delays occurred which were due to non-clinical factors. Reasons for delay included no theatre being available at the required time, the absence of a senior surgeon and the lack of an ICU or HDU bed. There were also ten cases where delay in referral by physicians contributed to a bad outcome (10/639, 2%). There were further cases where the advisors felt that delay in referral had occurred despite the fact that this was not commented on by the surgeon returning the questionnaire.

**CASE 12** • A 68-year-old patient was being treated with bed rest and analgesia for a crush fracture of the 1st lumbar vertebra. General surgeons were called when he had established peritonitis and sepsis due to perforated diverticular disease. A Hartmann's procedure was performed and later a laparotomy for an ischaemic colostomy. He died nine days after surgery from multisystem failure.

**CASE 13** • A 36-year-old patient with multiple fractures following an RTA developed abdominal pain. Eight days after the accident (following which he had complained of abdominal pain) a laparotomy showed a mesenteric tear and gangrenous ileum. This was resected but despite ICU care (at another hospital because of bed problems) he died from septicaemia 11 days after the accident.

## Seniority of surgeon

Table 3.58: Grade of the most senior operating surgeon (Figures for locums given in brackets)

Grade	Number
Consultant	346 (4)
Associate specialist	14
Staff grade	29
SpR with CCST	38
SpR 4 or greater	86
SpR 3	43
SpR 2	20
SpR 1	12
Visiting SpR (or year not known)	18 (4)
Premier SHO	17
SHO 2	6
Pre-registration house officer	1
Not answered	9 (1)
<b>Total</b>	<b>639</b>

Consultants operated on 54% (346/639) of the patients. In the 1990 sample consultants operated on 52% (618/1188) of the cases. The changes seen in the latest sample (Figure 3.13) are an increase in the number of cases performed by NCCGs (1% in 1990 compared to 7% in 1998/99), a decrease from 45% to 34% in cases undertaken by registrars and a small increase in cases where the operator was an SHO (2% in 1990 compared to 4% in 1998/99).

Figure 3.13: Grade of operating surgeon

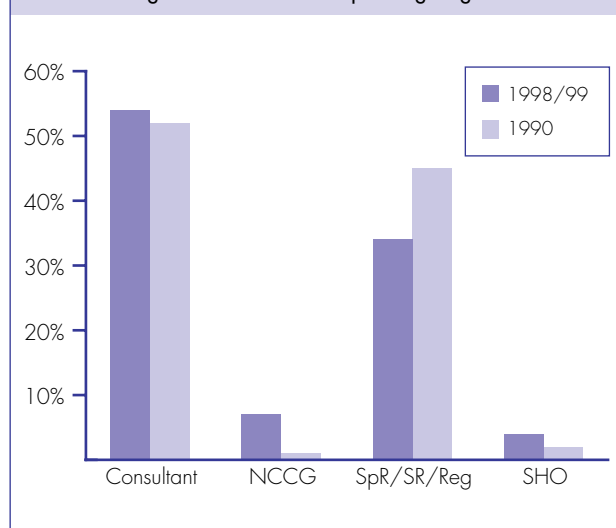


Figure 3.14 shows that there are still differences between the specialties in terms of the grades involved with patients, particularly in the trainee grades. Anaesthetists in basic training are far more likely to be the most senior anaesthetist present than surgical SHOs are likely to be in charge.

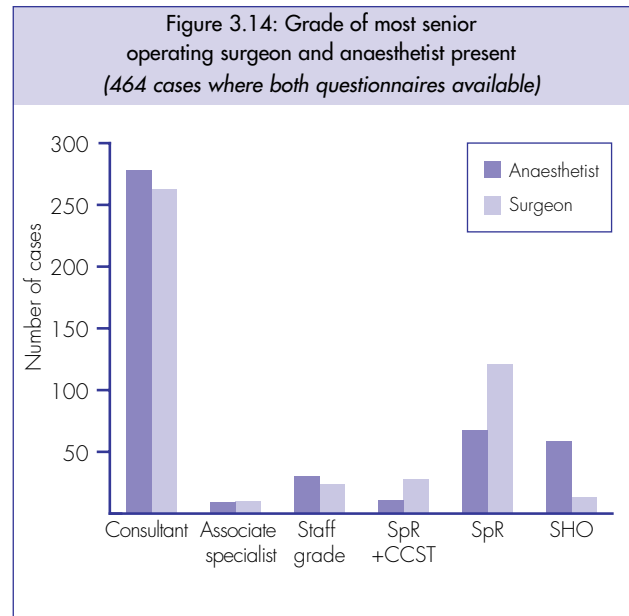


Table 3.59: Grade of most senior operating surgeon by classification of operation (Figures for locums given in brackets)

Grade	Emergency	Urgent	Scheduled	Elective	Not answered	Total
Consultant	58	147 (2)	111 (2)	26	4	346 (4)
Associate specialist	5	7	2	0	0	14
Staff grade	8	15	4	1	1	29
SpR with CCST	13	17	8	0	0	38
SpR 4 or greater	17	52	14	3	0	86
SpR 3	8	26	7	2	0	43
SpR 2	6	10	4	0	0	20
SpR 1	2	7	3	0	0	12
Visiting SpR (or year not known)	5	10 (3)	2 (1)	1	0	18 (4)
Premier SHO	3	12	2	0	0	17
SHO 2	0	4	2	0	0	6
Pre-registration HO	0	1	0	0	0	1
Not answered	0	6	2 (1)	0	1	9 (1)
<b>Total</b>	<b>125</b>	<b>314</b>	<b>161</b>	<b>33</b>	<b>6</b>	<b>639</b>

Consultant surgeons operated on 47% of the patients undergoing emergency or urgent procedures. The majority of these procedures were major undertakings and it was quite appropriate that a consultant was involved. With the move towards a consultant-based service this figure is likely to increase with time. There were 20 emergency or urgent procedures involving an unsupervised SHO or preregistration house surgeon. Of these 15 were done by Premier SHOs who would be capable of performing as an SpR 1. The death following a procedure by a house surgeon was a quite appropriate drainage of ascites under local anaesthesia on a ward. The other procedures included three laparotomies for

intestinal obstruction due to adhesions, three cases of strangulated femoral hernia and a miscellany of other procedures of intermediate to major complexity.

Table 3.60: Elective procedures performed by consultants

Procedure	Number
Ivor Lewis 2 stage oesophagogastrrectomy	1
Gastrojejunal pouch + Roux-en-Y	1
Laparoscopic fundoplication	1
Laparoscopic cholecystectomy converted to open cholecystectomy	2
ERCP and stent insertion	1
Gastrojejunostomy & ileo transverse bypass	1
OGD and colonoscopy	1
Toilet mastectomy and chest wall excision, reconstruction chest wall	1
Open prolene mesh repair of inguinal hernia	2
Laparotomy and transverse loop colostomy	1
Sigmoid colectomy & bilateral ureteric catheterisation	1
Resection hepatic flexure colonic carcinoma and distal gastrectomy (Polya)	1
Transabdominal rectopexy	2
Closure of ileostomy	2
Closure of colostomy	1
Hartmann's procedure	1
Anterior resection of rectum	3
Abdominoperineal resection of rectum	2
Transanal excision of villous adenoma	1
<b>Total</b>	<b>26</b>

There were 26 elective procedures performed by consultants. These were largely major procedures and are listed in Table 3.60.

## Audit

While 82% (524/639) of these deaths had been discussed at an audit meeting, there were still 18% of deaths that were either not discussed or about which we do not have information. It is noteworthy that the general surgical sub-specialties had the highest rate of audit amongst specialties in 1998/99 and that there has been a considerable improvement since 1990 when 71% of deaths were considered at an audit meeting. It is our opinion that no death following a surgical procedure should be allowed to pass unremarked. All deaths should be subject to audit.

## Other issues identified

### *Bowel obstruction*

There were cases where patients with malignant small intestinal obstruction were treated with laparotomy. There are now good regimens for the pharmacological management of this problem and, in terminal illness, laparotomy should be avoided if at all possible<sup>51</sup>.

### *Friction between surgeon and anaesthetist*

The questionnaires returned for this report appeared to contain more statements and allusions

to a breakdown in collaboration between the specialties than has been seen previously. It is unclear whether this is a general attempt to shift blame in the current climate of clinical practice (despite the advent of clinical governance and a 'blame free' culture), a few isolated incidences or a more widespread breakdown in collaboration.

**CASE 14** • An 88-year-old patient was treated in a teaching hospital for perforated diverticular disease. The anaesthetist thought 'it was considered inappropriate to proceed to full postoperative support in view of the patient's age and pathology. However, at the insistence of the surgical team, full support was instituted'. The surgeon stated 'I asked for the patient to be nursed in ICU but this was not complied with'. The patient was subsequently admitted to ICU where, despite full support, she died.

**CASE 15** • A 77-year-old patient was admitted in a moribund state with acute abdominal pain. She was reviewed by a consultant anaesthetist who personally telephoned a consultant surgeon and asked him to review the patient before surgery. The surgeon refused to see the patient and instructed an SHO to go ahead with a laparotomy. The anaesthetist wrote: 'moribund patient with severe COPD and acute abdomen. Hypoxic, tachycardic, hypokalaemic, acidotic. Sent to ICU for resuscitation for four hours. Not fit for surgery but duty surgeon insisted on opening to ensure that there was not a simple remediable cause. I am reluctant to anaesthetise this moribund patient'. The patient died the same day.

The consultant surgeon's behaviour was deplorable. It also showed an ignorance of pathology; while there may have been a 'simple' technical problem within the abdomen, this patient was most unlikely to survive anaesthesia and surgery.

**CASE 16** • An open feeding jejunostomy was performed on a 78-year-old patient who could not swallow. Seven years previously he had undergone an oesophagectomy and a recent cerebrovascular accident had resulted in dysphagia. The anaesthetist said that he was being asked to do an increasing number of this type of patient and procedure and that he could not see the benefits for the patient. The surgeon reported that he was under pressure from both physician colleagues and the patient's relatives.

There did not appear to be much 'teamwork' in this case. There were other examples where cooperation and teamwork appeared to have broken down. Surgeons and anaesthetists should strive to maintain the good professional working relationships that have built up over the last two centuries. If audit and other initiatives are creating an atmosphere of blame shifting we should take positive corrective steps and work to avoid further deterioration.

### *Epidurals and heparin*

The advisors noted many cases where pharmacological thromboembolic prophylaxis was omitted despite the presence of a protocol. The explanation was often that the anaesthetist wished to use a regional (epidural) anaesthetic technique and that the use of heparin was contraindicated until the epidural catheter was in place. Unfortunately the prophylaxis was often not commenced at all.

There are recommendations on this issue and anaesthetic departments should have a protocol. It is important that appropriate prophylaxis is started as soon as it is safe to do so<sup>52</sup>.

### *Inappropriate operations*

There were 50 (50/639, 8%) cases in which the advisors considered that the surgery was inappropriate. The reasons for this were multiple; they included the following:

- There was a better, alternative procedure:

**CASE 11** • A 48-year-old patient had a 3-stage oesophagectomy and insertion of a feeding jejunostomy (see page 90 for further details of this case).

Why did the surgeon elect for this over ambitious operation when lesser alternatives were available which might have allowed the patient to leave hospital for palliative care?

- There was no hope of success:

**CASE 17** • A 75-year-old ASA 4 patient had a laparotomy for peritonitis. Surgery was performed by an SpR 3. At operation ischaemic bowel was found. The surgeon resected the gut but the patient died on the table. No consultant supervision or opinion was available.

The surgeon should have decided to close the abdomen without a resection. The lack of consultation for advice is regrettable.

- There was a clear diagnosis of advanced malignancy and surgery was of no benefit to the patient. Palliative treatment was a better choice:

**CASE 3** • An 81-year-old patient, who was unresponsive and moribund, had a laparotomy in order to diagnose an abdominal mass (see page 85 for further details of this case).

Was it necessary to operate at all?

- Preoperative investigations might have identified (or excluded) the intra-abdominal problem and avoided surgery (often a laparotomy):

**CASE 18** • An 84-year-old patient presented to a teaching hospital with acute abdominal pain. A laparotomy was performed without any specific investigations or referral to a consultant. The laparotomy was negative. The patient died from a pulmonary embolus ten days later.

The management of this patient is indefensible. While this case involved a negative laparotomy, in many cases where malignancy was found, few preoperative investigations were done.

- An inappropriate case to use as a teaching session:

**CASE 19** • A 79-year-old patient had a right hemicolectomy for a tumour. A consultant was present and teaching. The SpR 1 operated and took three hours to do the procedure. The patient died later.

The operation took too long. While death may not have been related to the length of operation, there is evidence that this consultant does not understand how to teach. It is not necessary to add to the length of surgery if the teaching is done in a structured manner.

- The general condition of the patient indicated that surgery was inappropriate:

**CASE 20** • An 89-year-old patient presented with small bowel obstruction. The patient already had cardiac failure and a chest infection. A carcinoma of the ascending colon was found at laparotomy. Hepatic secondaries were present. Nevertheless a right hemicolectomy was performed. The patient died.

## *Pressure on surgeons*

In ten cases (10/639, 2%) surgeons reported that they operated against their better judgement due to pressure from relatives or medical colleagues. Examples included operations which were considered unkind (see cases 10 on page 90 and 16 on page 95), operations with no chance of success and cases where more careful investigation using non-surgical techniques might have identified a diagnosis. Surgery might be a quicker option than pursuing investigations but must be requested appropriately and with some chance of a successful outcome.

**CASE 21** • A 68-year-old man was in an ICU with septic shock. He was under the care of physicians. There was no evidence in the questionnaire of any imaging or other investigations but the advisors felt that it was highly likely that these would have been done. The surgeon came under pressure from the physicians to look for a source of sepsis within the abdomen. He agreed to a laparoscopy, which was negative. The patient subsequently died and pancreatitis was found at postmortem examination.

If a surgeon firmly believes that surgery is contraindicated for whatever reason, then he must justify those reasons and decline to operate. A second opinion can always be sought.



## Key Points

- The number of procedures undertaken by consultants in this specialty is high (82%) and has increased since 1990 when it was 68%.
- No procedures were performed by SHOs.
- Preoperative assessment was sometimes deficient in elderly patients with malignancy.
- The benefit of surgery was unclear in a small number of elderly patients with disseminated malignancy.

The majority of the 22 patients in this group were over 60 years old (86%) and this is similar to the 1990 findings<sup>4</sup>.

## Procedures

The majority of procedures (86%) were undertaken for patients with gynaecological malignancy, or where malignancy was suspected.

Table 3.61: Gynaecological procedures (22 cases; procedures may be multiple)

Procedure	Number
Laparotomy	8
Total abdominal hysterectomy	3
Oophorectomy	7
Omentectomy	4
Omental biopsy	4
Other	12

## Admission category

In this specialty 13/22 (59%) cases were admitted either urgently or as emergencies, compared to 43% in 1990.

## Shared care

Shared care was undertaken in only 36% of cases.

## Seniority of surgeon consulted

In 1990, consultant involvement in the decision to operate was high and in this sample, in all cases, a consultant was involved in the decision to operate.

## Coexisting medical disorders

Forty-five percent (10/22) of patients had pre-existing cardiac and/or respiratory disease.

## ASA status

Fifty-five percent (12/22) of patients were graded ASA 3-5. In only one ASA 1 case was death not expected. There has been no significant shift in the ASA grading between this sample and the 1990 sample.

## Delays

There were no cases in which significant delays occurred between the decision to operate and operation in this specialty.

## Seniority of operating surgeon

The majority of procedures were undertaken by consultants (18/22, 82%). This is an increase by comparison with the 68% of cases operated upon by consultants in the 1990 sample. No operations in this sample were performed by SHOs.

## Decision making

In the 1990 sample, a number of questions were raised about the appropriateness of surgery in patients with advanced malignancy. Similar questions are raised in this sample:

**CASE 22**• A 73-year-old ASA 3 patient with advanced abdominopelvic malignancy underwent laparoscopic ovarian and peritoneal biopsies. Was this appropriate?

**CASE 23**• A 78-year-old ASA 2 patient underwent laparotomy, oophorectomy and omentectomy, for disseminated abdominopelvic malignancy. A CT scan had not been performed, and pathology revealed no evidence of ovarian malignancy. Should a general surgical or oncological opinion have been sought prior to operation?

## Audit

The number of cases considered at audit meetings was 8/22 (36%). This is similar to the response in 1990.

## Key Points

- *Consultants were involved in the care of all patients.*
- *Thromboembolic prophylaxis was used in 75% of patients, representing a significant increase over the 6% reported in 1990.*
- *A small number of elderly patients with a very poor prognosis had operations which were of questionable benefit.*

Fifty percent of patients (34/68) were under 60 years of age, and the male to female ratio was 1:1.

## Procedures

The most common procedures are shown in Table 3.62. The range of procedures performed is similar to the 1990 sample<sup>4</sup>.

Table 3.62: Common neurosurgical procedures (68 cases; procedures may be multiple)

Procedure	Number
Craniotomy for haematoma	24
Craniotomy for tumour	11
External ventricular drain	17
Burr holes	11
Stereotactic biopsy	2
Other	17

## Admission category

As in 1990, the majority of patients were admitted as emergencies (69%).

## Shared care

Only 13% of cases were managed on a formal shared care basis.

## Seniority of surgeon consulted

Consultants were involved in the care of all 68 patients.

## Coexisting medical disorders

Fifteen percent of patients had pre-existing cardiac disease and 15% of patients had pre-existing respiratory disease.

## ASA status

Sixty percent (41/68) of patients were graded ASA 4 or 5, and 50/68 (74%) were either regarded as at definite risk or expected to die. These grades are in keeping with the 1990 report.

## Therapeutic manoeuvres

The 1990 report identified 82/87 (94%) cases in which no DVT prophylaxis was administered, and at least three deaths were attributable to pulmonary embolus. By contrast, only 17/68 (25%) cases in the present sample were not given DVT prophylaxis. There were no reported deaths due to pulmonary emboli.

## Delay

In only one case was a possibly remediable delay encountered when a cerebral angiogram could not be obtained.

## Classification and day of operation

The majority of operations 35/68 (51%) were classified as emergencies and, interestingly, emergency operations occurred predominantly on Mondays (11/35, 31%). Does this reflect a deficiency in primary, secondary or tertiary services at weekends?

## Seniority of operating surgeon

Registrars performed 38/68 (56%) procedures and an SHO performed only one. Consultants performed 25/68 (37%). Where the operator was not a consultant, a consultant was immediately available in 18/43 (42%). In only four cases did the operator not possess a relevant higher surgical diploma. In no case did the advisors feel that the grade of operator was inappropriate to the procedure being performed. In 1990 consultants performed 29/87 (33%) operations.

## Decision making

As in the 1990 study, advisors were concerned about the value of surgery in a small number of cases.

**CASE 24** • A 72-year-old ASA 5 patient underwent craniotomy for an acute subdural haematoma, the procedure being performed by an SpR 3. The patient was moribund with fixed dilated pupils. Was surgery appropriate?

**CASE 25** • A 64-year-old ASA 4 patient, with known carcinomatosis, underwent a CT guided cerebral biopsy. What was the indication in this terminally ill patient?

## Audit

A total of 51/68 (75%) cases were considered at an audit meeting; a significant improvement over the 1990 figure of 39%.

# OPHTHALMOLOGY

## Key Points

- *These patients were elderly with a significant degree of coexisting medical disease. Despite this the majority of patients were treated in hospitals with no HDU or ICU and two patients were treated in single specialty hospitals.*
- *Audit of deaths continues to be carried out infrequently in this specialty.*

There were only eight cases in this sample. All were over 50 years of age and all but two were over 70 years. The female to male ratio was 1.7:1.

All of these patients were admitted electively, and none was managed on a formal shared care basis.

## Procedures

Procedure	Number
Unilateral cataract extraction and implant	3
Bilateral phacoemulsification and lens implants	1
Removal of implant	1
Vitreotomy	1
Trabeculectomy	1
Eyelid procedures (Wies)	1

## Anaesthesia

General anaesthesia was used in two cases. In one case local anaesthesia was administered in the presence of an anaesthetist and in the remaining five cases, local anaesthesia was administered by the surgeon.

## Seniority of surgeon consulted

Consultants were involved in the care of 6/8 patients.

## Coexisting medical disorders

Three patients had pre-existing cardiac disease, and two had pre-existing respiratory disease.

## ASA status

One patient was ASA 1, three patients ASA 2 and four patients ASA 3. Death was not expected in any of the eight patients.

Advisors expressed concern about the five elderly patients with significant coexisting medical

problems undergoing surgery in hospitals without HDU/ICU facilities. Concern was also expressed about two cases undertaken in single specialty hospitals with very limited access to general medical back up.

**CASE 26** • A 75-year-old ASA 4 patient with bilateral leg amputations, diabetes and angina, on warfarin, underwent vitrectomy under general anaesthesia in a single specialty hospital. No HDU or ICU facilities were available. Should patients with extensive coexisting medical problems be treated in single specialty hospitals without access to HDU/ICU and other back up facilities?

## Decision making

**CASE 27** • An 88-year-old ASA 3 patient underwent bilateral cataract extraction and intraocular lens implants under general anaesthesia. Should bilateral procedures be performed, and should general anaesthesia be employed?

## Delays

There were no delays reported. One procedure was urgent, one scheduled and six elective.

## Seniority of operating surgeon

Consultants operated on 6/8 patients.

## Audit

Only one patient was considered at an audit meeting. The low rate of audit of deaths in this specialty has been commented upon previously.

# ORAL AND MAXILLOFACIAL SURGERY

## Key Points

- *Patients undergoing surgery should have their general medical status optimised prior to operation, particularly when surgery is non-urgent.*
- *Patients with significant cardiovascular disease would benefit from the presence of an anaesthetist and appropriate monitoring, even when local anaesthesia is employed.*

There were five deaths in this specialty; all patients were over 60 years old. Three of these patients were elective admissions.

## Procedures

Table 3.64: Oral & maxillofacial procedures

Procedure	Number
Tracheostomy	1
Extraction of two dental roots under LA	1
Incisional biopsy under LA	1
Partial left maxillectomy	1
Excision carcinoma in situ, bilateral medial canthi supraclavicular Wolfe graft repair under LA	1

## Shared care

Formal shared care was undertaken in only one case. Consultants were involved in the care of all but one case.

## Coexisting medical disorders

Two patients had pre-existing cardiac problems and two had pre-existing respiratory problems.

## ASA status

One patient was graded ASA 4 and the remainder were ASA 2 or 3. Death was not expected, by the surgical team, in any of these patients.

## Therapeutic manoeuvres

All but one of the cases were managed in units with an anti-thromboembolic prophylaxis protocol, and 2/5 patients received prophylaxis.

## Delay

No delays were reported in the care of this group of patients.

## Seniority of operating surgeon

Consultants operated on 3/5 patients.

**CASE 28** • A 60-year-old ASA 3 patient was admitted electively for bilateral excision of carcinoma in situ and skin grafts to the medial canthi, under local anaesthesia. Immediately prior to the procedure the patient suffered an ischaemic attack which responded to GTN. Surgery was performed by an SpR 3 using LA, without any monitoring, and without an anaesthetist being present. Was this appropriate? This case was not considered at an audit meeting.

## Audit

Three out of five cases were considered at a local audit meeting.

## Key Points

- A greater percentage of patients in this study were admitted as emergencies compared with the 1990 group.
- Shared care remains uncommon, despite the predominance of an elderly group of patients with significant coexisting medical problems. The specialty should have clear standards of care for the non-surgical management of trauma patients.
- There has been an increase in the number of patients receiving thromboembolic prophylaxis from 15% in 1990 to 74% in this sample.
- The reduction in the number of operations performed by registrars since 1990 has been matched by an increase in the number of operations performed by NCCGs.
- In this sample 39% of NCCGs had no relevant postgraduate qualification.
- Delays in treating trauma patients still occur for non-medical reasons despite an increase in the number of dedicated trauma lists.

There were 341 deaths reviewed in comparison with 420 in the 1990 report<sup>4</sup>. There was no significant difference in the age distribution with 92% of patients being aged between 70-99 years in this sample compared with 88% in the 1990 group. The male to female ratio was 1:1.9 in both samples.

Table 3.65: Common orthopaedic procedures

Procedure	1998/99		1990	
	Count	%	Count	%
Hip fracture (various)	239	70%	303	72%
Total hip replacement	15	4%	29	7%
Revision hip prosthesis	2	1%	12	3%
Total knee replacement	4	1%	5	1%

In both groups the range of procedures performed was similar, with the majority being undertaken for hip fracture.

## Admission category

In 1990, 251/420 (60%) orthopaedic admissions were classified as emergency, whereas in the present sample, 287/341 (84%) were so classified. What is the reason for this?

## Shared care

In 1990 only 90/420 (21%) cases were managed under formal shared care, whereas in the present sample this had increased to 104/341 (30%). There was a difference of opinion between orthopaedic advisors regarding the role of formal shared care. Some orthopaedic surgeons prefer to take an holistic approach to the management of their

patients and are enthusiastic about being directly involved in the medical management of their own patients. Others would prefer to undertake care on a more formally shared basis with specialist physicians. The specialty should have clear standards of care for trauma patients who are predominantly elderly and have significant coexisting medical problems. This component of orthopaedic management should be more rigorously audited.

## Seniority of surgeon consulted

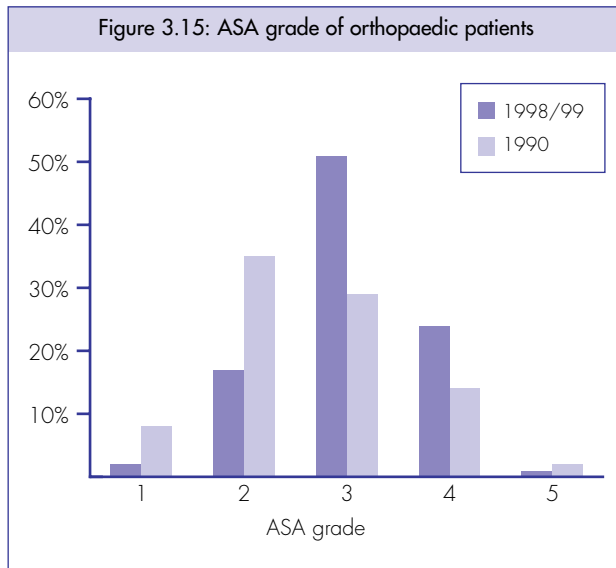
In 1990, 285/420 (68%) cases involved a consultant prior to surgery, whereas in the present sample 314/341 (92%) patients benefited from the consultant having been involved in their care.

## Coexisting medical disorders

In both samples 33% (1998/99: 112/341 and 1990: 140/420) had respiratory problems. Fifty-three percent (180/341) and 47% (199/420) respectively had cardiac problems.

## ASA status

In this sample, surgeons used ASA grades 1, 2 and 5 less frequently, but tended to use grades 3 and 4 more often than in 1990 (Figure 3.15). Similar numbers of cases were designated as carrying small, significant or definite risks of death.



## Therapeutic manoeuvres

There was no significant difference in the range of preoperative therapeutic manoeuvres undertaken in either sample, with the exception of DVT prophylaxis. In 1990 only 64/420 (15%) patients received DVT prophylaxis, whereas in this sample 254/341 (74%) patients received prophylaxis. Of the 87 patients who received no prophylaxis, 28 were judged to be at high or moderate risk of thromboembolic complications. In only 188/341 (55%) cases was there an anti-thromboembolic protocol.

A urinary catheter was placed in only 89/341 (26%) patients. Of the remaining 252 patients, 143 were known to have either pre-existing renal or cardiovascular disease where careful fluid and electrolyte balance was required.

## Delays

Despite the improvements in availability of trauma lists which have been demonstrated over the ten year period, it was disappointing to note that a significant number of orthopaedic patients are still having their operations delayed for non-clinical reasons. In 1990, 43/420 (10%) were so delayed compared with 40/341 (12%) in the present sample. Why is this? Is the failure to staff trauma lists with consultants a factor? Could it be that the failure to

provide trauma lists at weekends is actually making delays worse for some patients?

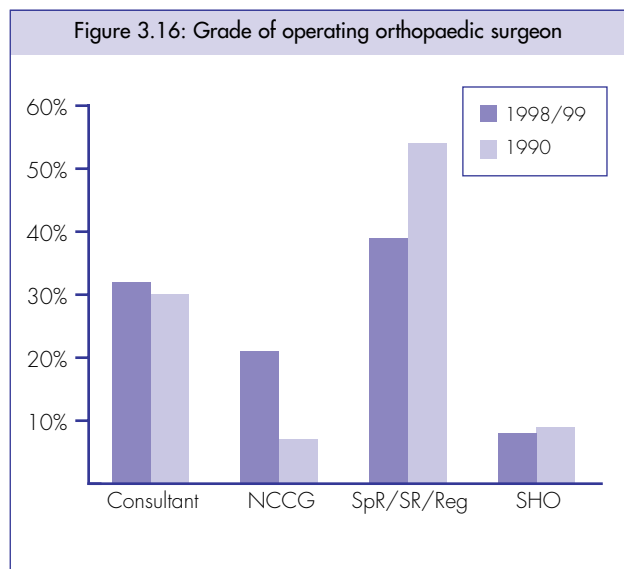
**CASE 29** • A 73-year-old ASA 3 patient admitted with a fractured neck of femur had to wait for five days before a theatre was available to treat her. She died 11 days following surgery of bronchopneumonia.

## Classification and day of operation

There was no significant difference between the two samples in terms of either day of operation or classification.

## Seniority of operating surgeon

Consultants operated on 108/341 (32%) cases in this sample, compared with 124/420 (30%) in 1990. There has been a reduction in the number of cases being treated by SpRs; however, in 1990 only 28/420 (7%) were operated upon by NCCGs whereas, in the present sample, there was a significant increase (71/341, 21%). Of these 71 NCCGs, 28 (39%) had no relevant postgraduate qualification. NCEPOD has previously commented upon the increasing trend toward the use of NCCGs, particularly in emergency surgery, and the significant number of such surgeons who possess no postgraduate qualification.



## Audit

In 1990, 207/420 (49%) deaths were considered at audit meetings; in the present sample the figure was 206/341 (60%).



## Key Point

- *Major head and neck surgery continues to be performed on elderly patients with coexisting medical problems, in hospitals without on-site HDU or ICU facilities.*

There were 22 cases in this sample. There were seven patients under the age of 60 years, and there were equal numbers of male and female patients. Ten patients were admitted electively and nine as emergencies. There was no significant difference between this sample and the 1990 sample<sup>4</sup>.

Table 3.66: Otorhinolaryngology procedures (22 cases; procedures may be multiple)

Procedure	Number
Tracheostomy	7
EUA/endoscopy	5
Biopsy	3
Neck dissection and excision of malignant tumour	3
Partial glossectomy	1
Thyroplasty	1
Incision & drainage pharyngeal abscess	1
Debulking nasal tumour	1
Ivor Lewis oesophagectomy	1
Insertion of grommet	1
Insertion of nasogastric tube	1
Other	2

## Shared care

In 8/22 cases care was undertaken on a shared care basis.

One patient was managed in a hospital without on-site ICU/HDU facilities.

**CASE 30** • A 99-year-old ASA 3 patient underwent a partial glossectomy for a T2 carcinoma. Despite the patient having evidence of a preoperative chest infection, no chest radiograph was performed, and the operation was carried out by an SpR 2 in a hospital without on-site HDU or ICU facilities; these were available at another hospital within the Trust, but several miles distant. Was this appropriate?

## Seniority of surgeon consulted

In 17/22 (77%) cases a consultant was involved in care.

## Coexisting medical disorders

Respiratory problems pre-existed in 11/22 (50%) patients and cardiac problems were present in 6/22. Death was not expected in 11/22 (50%). A total of nine patients were graded ASA 4 and the remainder were ASA 2 or 3.

## Therapeutic manoeuvres

All but six cases were managed in units with a DVT prophylaxis protocol. Ten patients (45%) received DVT prophylaxis.

## Delays

There were no cases in which non-medical delay occurred in this speciality.

## Classification and day of operation

There was only one emergency operation and this was performed on a Sunday. The majority of operations were classified as urgent or scheduled (19/22, 86%) and these were all performed on weekdays.

## Seniority of operating surgeon

Consultants performed 13/22 (59%) of the procedures. Specialist registrars performed 7/22 (32%); only one case was performed by a premier SHO and one by a staff grade. Again, allowing for the different grading system in 1990, there would appear to be no significant change since 1990. Unlike some other specialties, the staff grade surgeon does not seem to have replaced SpRs operating on urgent or emergency cases.

## Audit

Fifty-five percent (12/22) of cases were considered at audit meetings, showing an improvement since 1990 when 36% of cases were considered at audit.



## PAEDIATRIC SURGERY

### Key Points

- *Surgeons with appropriate training and experience treated the majority of children.*
- *Temperature maintenance is important in children.*
- *In the presence of multiple trauma, the management and timing of surgery require discussion and collaboration.*

There were 18 patients in the sample who were under 16 years of age when they died.

Children of ten years and under were excluded from the 1990 sample so comparisons are not possible. There were nine cardiothoracic procedures; the remaining deaths were principally due to necrotising enterocolitis (which was discussed in a previous report<sup>2</sup>) and tumours. Most deaths occurred in sick children and were inevitable. The advisors did identify two cases that raised issues.

**CASE 31** • *A two-month-old baby had a paralysed hemidiaphragm following a switch procedure. The child was referred from a university/teaching hospital to a specialty hospital as a semi-urgent case for diaphragmatic repair. The operation was to be performed by a consultant surgeon and a consultant administered the anaesthetic. At the time of anaesthetic induction the infant's temperature was 32°C. The child collapsed and died during induction of anaesthesia.*

The low temperature may have contributed to the collapse. It is important to ensure that a baby's temperature is maintained.

**CASE 32** • *An 11-year-old child was injured in an accident; she suffered a severe head injury, knee injuries and a fractured femur. She was managed in a DGH under the joint care of a neurosurgeon and an orthopaedic surgeon (locum). Due to an altering level of consciousness she was admitted to an ICU and the lungs were ventilated. Two days after admission, surgery was undertaken to treat the limb injuries. During surgery there were haemodynamic changes; she developed raised intracranial pressure, coning and died.*

The advisors made several comments. Despite the apparent shared care there was no evidence of a CT scan prior to the surgery. There was also no evidence of intracranial pressure monitoring during surgery. The question was raised as to whether the orthopaedic surgery was premature given the neurological problems. The locum orthopaedic surgeon had received an unorthodox training and may not have been appropriately trained in the management of children.

The recently published report on children's surgery<sup>53</sup> emphasises the need for surgeons and anaesthetists who regularly treat children to be specifically trained and updated in the paediatric aspects of the chosen specialty.

## PLASTIC SURGERY

### Key Points

- Major surgery is being undertaken on elderly patients with significant coexisting medical problems, in hospitals without HDU or ICU facilities.
- Delay is occurring due to an inadequate number of ICU beds available for the postoperative management of complex scheduled surgery.

Table 3.67: Plastic surgery procedures

Procedure	Number
Debulking neck metastasis	1
Evacuation of haematoma right lower leg, debridement and split skin graft	1
Change of burn dressing	1
Debridement lacerations to face & suture. Debridement and skin graft left arm and left leg	1
Excision squamous cell carcinoma left leg and split skin graft	1
Repair laceration to left ear	1
Revision reconstruction of pharyngolaryngectomy with right free radial forearm flap	1
Excision burns left upper arms/shoulders & skin grafting. Excision burns scalp & skin grafting	1
Shave excision of lesion on back	1
Excision biopsy of two skin nodules	1
Extensive burns	1
Incision of infected areas left thigh	1
Wound debridement	1
Second pectoralis major flap repair to cervical fistula	1
Full thickness abdominal wall resection, Marlex mesh, omental flap and skin graft	1

Fifteen cases were studied in this specialty. A wide range of procedures was undertaken. There was no significant change in the age and sex distribution compared with 1990<sup>4</sup>.

### Admission category

The majority of admissions in this specialty were emergency or urgent (10/15, 67%).

### Shared care

Within this specialty, 8/15 (53%) cases were managed on a shared care basis. This is perhaps not surprising given the nature of the specialty. However, care was usually shared between different surgical groups. In all 15 cases there was significant comorbidity, but in only five cases were physicians involved. In five cases patients were managed in hospitals without an HDU and in three cases in hospitals without access to either HDU or ICU facilities.

**CASE 33**• An 88-year-old patient, graded ASA 2, underwent debulking of a metastatic tumour in the neck. The procedure was undertaken in a hospital without ICU or HDU facilities. Was this appropriate?

**CASE 34**• A 76-year-old ASA 4 patient with COPD and hypertension underwent revision with a free radial forearm flap, following four previous failed attempts to reconstruct following pharyngolaryngectomy. The patient was poorly nourished and had had a carotid blow-out. The operation was cancelled due to unavailability of ICU beds, and several days' delay occurred. The patient subsequently died on the ICU of pseudomonas pneumonia.

### Seniority of surgeon consulted

Consultant involvement remains high in this specialty with 13/15 (87%) cases where consultants were involved prior to operation.

## Coexisting medical disorders

All 15 patients had significant coexisting medical problems. Ten (67%) of these patients had pre-existing respiratory and/or cardiac problems. Psychiatric illness was present in 5/15 (33%).

## ASA status

Sixty percent (9/15) of cases were graded ASA 3 or 4, and in seven cases there was deemed to be a definite risk of death. In only one ASA 1 patient was death not expected.

## Therapeutic manoeuvres

Eighty percent (12/15) of patients were classified as at high or medium thromboembolic risk. Four of these patients may not have received prophylaxis.

## Delays

Only one case was reported as being delayed for non-medical reasons.

## Seniority of operating surgeon

Almost half (7/15) of these procedures were undertaken by consultants. Three procedures were undertaken by SHOs.

## Audit

Ten cases (67%) were considered at an audit meeting, which appears to be an improvement on the 50% reported in 1990.

## UROLOGY

### Key Points

- Consultants continue to perform the majority of operations in this specialty, although there has been an increase in the number of procedures performed by NCCGs compared with 1990.
- All NCCGs operating in this sample had a relevant postgraduate qualification.
- A small number of elderly patients underwent operations where the benefits of surgery are unclear.

The majority of patients (89% in 1998/99 and 93% in 1990) were aged 60-99 years. Sex ratios varied slightly being male: female 4.5:1 in 1990 and 1.9:1 in this sample. There was no significant difference in admission category.

In 1990, one of the main concerns for advisors was the number of urological procedures being undertaken by non-urologists. In 1990<sup>4</sup>, of 161 procedures, 22 were undertaken by surgeons with no stated interest in urology; 91 (57%) procedures were undertaken by trained urologists. In the present sample, all but 8/73 (11%) cases were undertaken by urologists. With three exceptions, all of the non-urologists in the present sample professed a special interest in urology. In contrast to the experience in 1990, there was no evidence from this sample that non-urologists were submitting patients to unnecessary open urological procedures.

Table 3.68: Urology procedures  
(73 cases; procedures may be multiple)

Procedure	Number
Cystoscopy	24
TURBT	17
TURP	11
Laparotomy	7
Nephrectomy	6
Cystectomy	5
Bladder washout/clot evacuation	4
Other	14

### Shared care

The response to this question was not reported in 1990; despite the elderly population of patients in this year's sample, only 20/73 (27%) cases were managed on a formal shared care basis.

### Seniority of surgeon consulted

In only 3/73 cases (4%) was a consultant not involved in the decision to operate. Consultant urologists have consistently been involved in the care of the majority of patients.

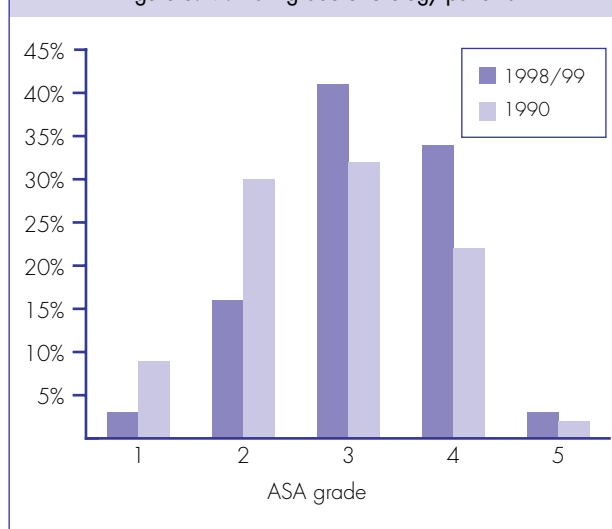
### Coexisting medical disorders

In this sample 19/73 (26%) patients had pre-existing respiratory problems, 29/73 (40%) had cardiac problems and 21/73 (29%) had renal problems. These rates are very similar to those found in the 1990 study.

### ASA status

The majority of patients 55/73 (75%) were graded ASA 3 or 4. Death was regarded as a small significant or definite risk in 46/73 (63%) cases, compared with 66% in the 1990 sample.

Figure 3.17: ASA grade of urology patients



## Therapeutic manoeuvres

The overall rate of DVT prophylaxis in this group was 58/73 (79%) compared with 21% in the 1990 sample.

## Classification of operation

The majority of procedures in this specialty were classified as scheduled or elective (52/73, 71%). Only one emergency and one urgent operation were undertaken during weekends.

## Delays

Non-medical delay was only identified in four cases (5%). In no case was a lack of theatre time cited as the reason for delay. In one case there was no ICU bed available, and in another there was a staff shortage on the urology ward.

## Seniority of operating surgeon

In this sample, 51/73 (70%) procedures were performed by consultants, compared to 80% in 1990. The reduction of 10% is largely accounted for by the increasing number of procedures undertaken by NCCGs. In 1990 only 3/161 (2%) cases were performed by NCCGs, whilst in this sample 6/73 (8%) were performed by NCCGs. In contrast to some other specialties, all of these NCCGs were in possession of a higher postgraduate diploma.

Of the 22 cases where a consultant was not operating, in only seven cases was the consultant not immediately available. Consultant supervision in this specialty remains high.

## Decision making

In a number of cases, advisors questioned the benefits of surgery.

**CASE 35** • A 77-year-old ASA 4 patient with bilateral malignant ureteric obstruction, severe congestive cardiac failure and Alzheimer's underwent bilateral ureteric reimplantation, and died on the day of surgery. Would more conservative methods of palliation have been more appropriate?

**CASE 36** • A 74-year-old arteriopath had a TURP performed by an SpR 2. The procedure took 2 hours 30 minutes and blood loss was significant. The patient was returned to the ward after only 30 minutes in recovery and died the next day of a myocardial infarction.

**CASE 37** • A 78-year-old ASA 4 patient underwent laparotomy and biopsy for an inoperable malignancy, but it was unclear as to why the diagnosis could not have been achieved with ultrasound or CT guided biopsy. The patient died in renal failure two days following surgery.

## Audit

In this sample 54/73 (74%) cases were considered at an audit meeting; an increase compared with the 57% reviewed in the 1990 sample.

## VASCULAR SURGERY

### Key Points

- *There is more specialisation compared to 1990 but inappropriate operations are still occurring.*
- *The percentage of emergency aneurysm surgery done by surgeons without a vascular interest is higher than seen in 1990.*
- *No patient should have an amputation without the benefit of a vascular surgical opinion.*
- *There is concern over delay in referral from physicians and lack of medical involvement in surgical audit.*

There were 206 questionnaires relating to deaths after vascular surgery. The final procedures related to deaths in vascular surgery are listed in Table 3.69. The most common procedures leading to death were surgery for ruptured abdominal aortic aneurysm and above knee amputation. This situation has not changed since 1990<sup>4</sup>. It must be recognised that the majority of these patients are elderly and have extensive comorbidity that prejudices the outcome. In this sample 80% (165/206) of patients were aged between 70-100 years compared with 65% (291/449) in the 1990 group. There was a preponderance of males in both samples.

The majority of deaths (84%) were reported by general surgeons who expressed an interest in vascular surgery or by vascular surgeons. In the 1990 data this figure was 66%. Thus it is clear that specialisation continues. Nevertheless, it is necessary to maintain a degree of generalism in order to provide an emergency on-call rota for 'general surgery'. For how much longer can this be sustained; has the time arrived for specialist rotas?

Table 3.70: Specialty of surgeon in charge at time of final operation (206 cases; answers may be multiple)

Specialty	Number
Vascular	89
General	14
<i>General with a special interest in:</i>	
Vascular	84
Breast	11
Endocrine	4
Colorectal	3
Coloproctology	2
Gastroenterology	2
GI	2
Upper GI	2
Oncology	2
Urology	1
Transplantation	2

Table 3.69: Procedures in vascular surgery

(206 cases; procedures may be multiple. Some procedures were done by vascular surgeons when complications arose)

Procedure	Number
<i>Abdominal aortic aneurysm surgery (including iliac and thoracic aneurysms presenting to vascular or general surgeons):</i>	
Leaking (ruptured) aortic aneurysm	60
Urgent/elective surgery for non-leaking abdominal aortic aneurysm	12
Excision of aortic graft/abandoned repair and axillobifemoral bypass	3
Re-exploration for bleeding following abdominal aortic aneurysm repair	3
Leaking thoracoabdominal aneurysm	2
Ligation of abdominal aorta	1
Endoluminal stent graft	1
Leaking iliac aneurysm	1
<i>Aortoiliac surgery for occlusive disease:</i>	
Elective aortic bypass surgery	3
Iliodistal bypass	3
Femorofemoral crossover graft	2
Axillobifemoral bypass	2
Iliofemoral bypass	1
<i>Peripheral vascular surgery:</i>	
Femoral thromboembolectomy	19
Femorodistal bypass	8
Brachial embolectomy	7
Femoral endarterectomy and profundoplasty	3
Femoropopliteal bypass	3
Bypass of popliteal aneurysm	2
Repair femoral aneurysm	1
Removal of infected prosthesis and extra-anatomical reconstruction	1
<i>Amputation surgery:</i>	
Unilateral above knee amputation	28
Unilateral below knee amputation	16
Unilateral Gritti-Stokes amputation	3
Debridement ulcerated foot	3
Amputation of toes	2
Debridement amputation stump	2
Bilateral below knee amputation	1
Through knee amputation	1
Bilateral Gritti-Stokes amputation	1
Bilateral above knee amputation	1
<i>Miscellaneous:</i>	
Fasciotomy	2
Carotid endarterectomy	1
On-table iliac angioplasty	1
Debridement of leg ulcers	1
Thrombectomy of AV fistula	1
Drainage of perigraft infection	1
Insertion of Hickman line	1
Insertion of haemofiltration line	1
Repair aortic trauma	1
PEG	1
Bilateral inguinal hernia repair (at time of repair of aortic aneurysm)	1
Splenectomy	1
Subtotal colectomy and ileostomy	1
Laparotomy and removal of packs	1
Debridement of pressure sore	1

## Inappropriate specialty

All the cases where the specialty of the surgeon was felt to be inappropriate involved the care of patients with abdominal aortic aneurysms that presented acutely.

There were 4/60 (7%) cases, where an abdominal aortic aneurysm presented acutely, in which the advisors felt that a surgeon with a vascular interest might have obtained a better outcome. Instead, a general surgeon without a vascular interest was called upon to operate in these acute situations. This compares with 4% (8/224) of cases in 1990 where the specialty was considered inappropriate. In all four of these latest cases the repair of the aneurysm was accompanied by technical difficulties due to:

- Perirenal aneurysm
- Inflammatory aneurysm
- Coincidental peripheral occlusive disease

Such cases can be technically demanding to the most experienced vascular surgeons; we need to work towards a situation where a specialist vascular surgical rota ensures the availability of a vascular surgeon for every patient 24 hours a day.

Where deaths followed technical problems with perirenal aneurysms, it was apparent that the surgery was poorly managed by non-vascular surgeons. Such cases emphasise the need for dedicated vascular specialists. If this is impractical, then general surgeons who may find themselves operating on leaking abdominal aortic aneurysms should take the time to learn the surgical techniques appropriate for difficult perirenal aneurysms.

Inflammatory aneurysms can be difficult to identify preoperatively. One death was identified where a consultant general surgeon with a vascular interest, who had been in post for less than two years, ran into difficulties with an inflammatory suprarenal aneurysm. This case highlights the need for a spirit of teamwork and collaboration on vascular units so that junior consultants can be assisted and advised by more senior colleagues when appropriate. A more experienced surgeon might, for instance, have given the simple advice to abandon the surgery and refer the patient to a centre with the appropriate expertise when unexpected problems were encountered during surgery.

## Coagulopathy

Even when the difficult technical challenges of aneurysm surgery are overcome, severe diffuse bleeding can cause additional blood loss. Appropriate correction of any coagulopathy must

be made. Platelets are rarely provided for this type of surgery but are essential to correct bleeding related to thrombocytopenia. The anaesthetist monitoring the coagulation status should request platelets when needed and the pathological services should provide them.

## Technical errors

There were cases where the technical procedures were questionable. Two examples included a long composite iliotibial graft, crossing two joints, and a femoral embolectomy done in a bed on a stroke unit. The advisors considered that the complex graft was unlikely to succeed and an iliopofunda bypass alone would have been adequate. Failure to improve after this simpler graft would have led to an amputation, as did the more complex procedure. The embolectomy was done under local anaesthetic, in a ward, by a trainee surgeon. The advisors felt that this was inappropriate.

## Amputations

No patient should undergo amputation without the benefit of a vascular surgical opinion. There were several cases of precipitate decisions, lack of consultation and investigation. Not only were no vascular opinions sought but also, in some cases, no prophylaxis against thromboembolus was given. There was then considerable complacency about the cause of death (often given as myocardial infarction, without a postmortem examination). Death could well have been due to a pulmonary embolus.

## Inappropriate operations

Many operations were thought to be inappropriate. Common reasons were advanced malignancy with a terminal vascular event, patients with advanced arterial disease and numerous comorbidities and prolonged heroic (or simply slow and inexperienced) reconstructive surgery.



## Admission category

In 1990, 62% of the admissions were emergencies. This figure was similar in 1998/99, being 65% (133/206). It appears that the unplanned workload in vascular surgery remains fairly steady and does not reflect the increasing workload seen in some specialties.

## Delays

Surgeons reported delays due to non-clinical factors in 13 instances (13/206, 6%). The most common cause was delay in referral, by physicians, of elderly patients with ischaemic limbs. Other reasons were delay in transfer between hospitals and lack of an ICU bed. Advisors believed that some of the delays by physicians were crucial in affecting the outcome. By the time the patient was received by the vascular surgeons, surgery may have been inappropriate. Do physicians audit such cases or is the death attributed to surgery?

## Grade of most senior surgeon consulted

In 95% (196/206) of cases either a consultant or an SpR with a CCST was consulted about the management of these patients.

## Fitness for surgery

Cardiorespiratory disease and diabetes mellitus were the most common comorbidities present.

### ASA status

There were no ASA 1 deaths where death was not expected, i.e. there were no surprises (Table 3.71). There was a good correlation between the ASA status and the surgeon's perception of risk.

## Unfit for surgery

Patients may be denied elective surgery because they are unfit. When an emergency arises there is often a lack of communication and patients receive inappropriate surgery with no realistic hope of a successful outcome. This situation particularly applies to the surgery of ruptured abdominal aortic aneurysm. Whilst a lack of communication is often to blame, the surgeon sometimes feels under pressure to reverse his original decision when faced with an emergency presentation. Relatives may also pressurise the surgical team despite explanations that surgery is inappropriate. These pressures are often difficult to resist but it is the job of surgeons to help relatives understand the decisions made and the evidence upon which they are made.

There needs to be a means of recording the decision not to offer elective surgery to a patient for an aneurysm. A simple method is to lodge a copy of the letter recording this decision in the Accident & Emergency department (or other receiving area). When any patient with a ruptured aneurysm is admitted, the file could be checked for decisions concerning fitness for surgery. Another approach is to ensure that the patient's family are aware of the decisions about surgery.

Table 3.71: ASA status by anticipated risk of death

Risk of death	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Not answered	Not known	Total
Not expected	0	1	10	2	0	0	0	13
Small significant risk	0	7	19	9	0	1	0	36
Definite risk	1	9	55	54	16	1	0	136
Expected	0	1	2	7	9	0	1	20
Not answered	0	0	0	1	0	0	0	1
<b>Total</b>	<b>1</b>	<b>18</b>	<b>86</b>	<b>73</b>	<b>25</b>	<b>2</b>	<b>1</b>	<b>206</b>

## Grade of surgeon

Grade	1998/99		1990	
	Consultant	119 (1)	58%	254
Associate specialist	4	2%	5	1%
Staff grade	9	4%	0	-
SpR with CCST/SR	6	3%	74 (4)	16%
Registrar (all levels below SpR with CCST/SR)	60 (5)	29%	98 (11)	22%
SHO (all levels)	7	3%	18 (1)	4%
Not answered	1 (1)	<1%	0	-
<b>Total</b>	<b>206</b>		<b>449</b>	

The demise of the experienced senior registrar has meant that more patients are operated on by registrars with a much-reduced experience and, probably, a lesser knowledge base.

Grade	Emergency		Urgent		Scheduled		Elective	
	1998/99	1990	1998/99	1990	1998/99	1990	1998/99	1990
Consultant	80%	70%	24%	37%	62%	56%	86%	73%
Associate specialist	3%	1%	3%	-	-	2%	-	4%
Staff grade	1%	-	10%	-	3%	-	-	-
SpR with CCST/SR	3%	19%	2%	19%	5%	11%	-	15%
Registrar (all levels below SpR with CCST/SR)	13%	10%	55%	35%	24%	28%	14%	4%
SHO (all levels)	-	<1%	5%	9%	6%	4%	-	4%

Whereas, in the past, senior registrars performed a fair amount of emergency surgery this is not the case for SpRs with a CCST. These surgeons will soon be consultants; have they been exposed to a sufficient number of emergencies to enable them to practise unsupervised?

### Compilers' note

*There are no case reports in this section. This is at the request of the advisors nominated by the Vascular Surgical Society*

## Postoperative complications

Cardiac, respiratory and renal complications remain the most common postoperative problems.

## Audit

An audit rate of 80% (164/206) for these patients is above the aggregated figure of 75% for the whole sample. No figure was recorded in the 1990 data and so a direct comparison is not possible.