

Postdischarge unplanned admission in ambulatory surgery—a prospective study

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Received 21 February 2005; accepted 6 June 2005

Available online 7 October 2005

Abstract

Background:: Postdischarge recovery continues at home and some patients will need admission if complications occur.

Objective:: To analyze the postdischarge unplanned admission rate in a hospital-based ambulatory surgery unit.

Method:: Prospective non-comparative study. Patients admitted in the first 30 days postdischarge were included.

Univariate analysis was performed to identify independent predictive factors for these admissions.

Results:: The postdischarge unplanned admission rate was 1%. Urology, gynaecology and general surgery, patients 90 years or older and epidural anaesthesia were significant risk factors for postdischarge unplanned admission.

Conclusion:: The postdischarge unplanned admission rate was very low.

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Keywords: Ambulatory surgery; Ambulatory outcome; Postdischarge admission

1. Introduction

A discharge protocol is essential for safe practice in the day procedure setting. It is accepted that some patients will not be fit for discharge after surgery. Postdischarge recovery will continue at home and some patients will need admission if complications occur.

Postdischarge complications cannot be reasonably predicted. The causes may either be related or not related to surgical technique or anaesthetic procedures. The bibliography reports postdischarge unplanned admission rates following ambulatory surgery between 0.85 and 2.2% [4,5,7,8] while we do not know what it is following inpatient surgery. It should be understood that once ambulatory surgery programmes overcome the implementation step it will be almost impossible to carry out research with a higher evidence level

as a control group of patients for comparison will not be available [16,17].

2. Objective

To analyze postdischarge unplanned admission in a hospital-based ambulatory surgery unit.

3. Method

In a 38-month period, a prospective non-comparative study was carried out on postdischarge unplanned admissions in a hospital-based ambulatory surgery unit.

Patients admitted in the first 30 days postdischarge from the ambulatory surgery unit between October/1998 and December/2001 were included. All patients operated on in this period were followed and consecutive unplanned admissions were documented using a specific protocol.

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At the central database system information was cross referenced between the ambulatory surgery unit programme and the emergency room admission programme. Data were collected and all coincidences of the patients' identifications numbers were derived to a designed protocol for unplanned admission. Details documented included:

- age and sex;
- ASA status;
- surgical specialty;
- type of anaesthetic;
- operation performed;
- reasons for admission;
- lapsed time before admission;
- hospital stay;
- mortality.

Modified Aldrete Test in recovery phase 1 (PACU) and Postanaesthesia Discharge Scoring System (PADSS) in recovery phase 2 (ASU) were utilized. All the patients had reached the required score before discharge.

4. Definitions

- Major ambulatory surgery: procedures that need a recovery phase in the ambulatory surgery unit but no overnight stay is necessary.
- Minor ambulatory surgery: procedures that do not need a recovery phase in the ambulatory surgery unit. Patients are discharged when surgery is finished.
- Recovery phase 1: recovery time between the end of surgery and total haemodynamic and respiratory stability.
- Recovery phase 2: recovery time between the end of phase 1 and a satisfactory score in the discharge protocol (PADSS).
- Lapsed time before admission: period of time in days between discharge and postdischarge admission.
- ASA status: American Society of Anesthesiologists Physical Status Classification.

- PACU: postanesthetic care unit.
- ASU: Ambulatory surgical unit.

The postdischarge unplanned admission rate was calculated and descriptive statistics were utilized. The significant risk factors on postdischarge unplanned admission were reported as a relative risk (RR) with a 95% confidence interval.

Univariate analyses of five clinical factors (sex, age by group, ASA status, surgical specialties and type of anaesthetic) were performed to identify independent predictive factors for these admissions.

5. Results

Between October 1998 and December 2001, 16,601 of 21,693 elective surgeries were performed on an ambulatory basis. There were 6209 (37%) major ambulatory and 10,392 (63%) minor ambulatory procedures. Fig. 1 shows the percentages of both major and minor ambulatory surgery by surgical specialties.

In a 38-month period, there were 63 cases of postdischarge unplanned admission being a rate of 0.37% (63/16,601). These were distributed by surgical specialty as follows: General surgery 0.59% (25/4217), Vascular surgery 0.32% (2/613), Gynaecology 0.20% (4/1965), Ophthalmology 0.17% (5/2879), ENT (ear, nose and throat) 0.33% (2/604), Orthopaedic 0.49% (8/1624), Paediatric 0.76% (2/263), Urology 0.37% (15/3960) and Plastic surgery 0% (0/476). There were no postdischarge unplanned admissions following minor ambulatory procedures and their exclusion resulted in an admission rate of 1% (63/6209). Table 1 shows this rate by surgical specialty for major ambulatory surgery. Significant differences in the unplanned admission rate in General surgery, Gynaecology and Urology were found.

Female sex was 51%. No significance difference in the unplanned admission rate by sex was found (Table 2).

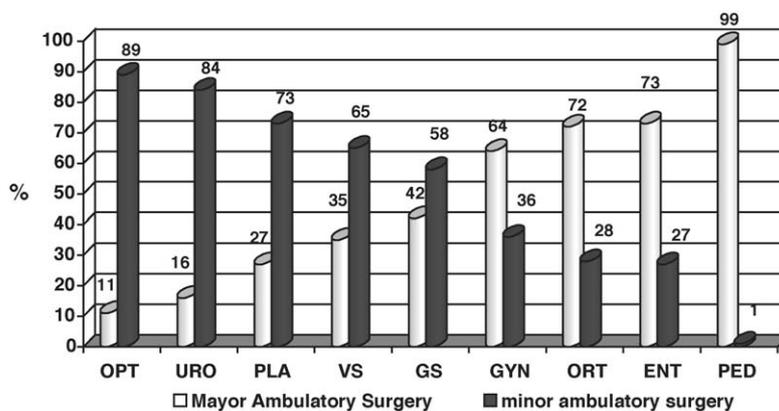


Fig. 1. Percentages of both major and minor ambulatory surgery by surgical speciality. OPT: ophthalmology; URO: urology; PLA: plastic surgery; VS: vascular surgery; GS: general surgery; GYN: gynaecology; ORT: orthopaedic; ENT: ear, nose and throat; PED: paediatric.

Table 1
Unplanned admission rate by surgical specialties for major ambulatory surgery

Surgical specialties	Number of patients	Unplanned admission rate (%)	Relative risk (95% confidence interval)	P-value
General surgery	25/1777	1.40	1.64 (0.99–2.71)	0.058593
Vascular surgery	2/216	0.92	0.91 (0.23–3.59)	0.62
Gynaecology	4/1261	0.31	0.27 (0.10–0.73)	<0.005
Ophthalmology	5/327	1.52	1.55 (0.63–3.84)	0.23
ENT	2/444	0.45	0.43 (0.10–1.74)	0.16
Orthopaedic	8/1167	0.68	0.63 (0.30–1.32)	0.21
Paediatric	2/260	0.76	0.77 (0.19–3.15)	0.50
Urology	15/628	2.38	2.78 (1.56–4.93)	<0.0002
Plastic surgery	0/129	0	–	–
	63/6209	1		

Table 2
Unplanned admission rate by sex

Sex	Number of patients	Unplanned admission rate	Relative risk (95% confidence interval)	P-value
Female	32/3589	0.89	0.75 (0.46–1.23)	0.25
Male	31/2620	1.18	1.33 (0.81–2.17)	0.25
	63/6209			

Table 3
Unplanned admission rate by age group

Age group (years)	Number of patients	Unplanned admission rate	Relative risk (95% confidence interval)	P-value
0–9	1/228	0.44	0.42 (0.06–3.04)	0.32
10–19	4/198	2.02	2.06 (0.76–5.61)	0.14
20–29	3/404	0.74	0.72 (0.23–2.28)	0.40
30–39	2/401	0.49	0.47 (0.12–1.94)	0.21
40–49	6/623	0.96	0.94 (0.41–2.18)	0.89
50–59	6/838	0.71	0.67 (0.29–1.56)	0.35
60–69	17/1253	1.35	1.46 (0.84–2.59)	0.17
70–79	17/1682	1.01	0.99 (0.57–1.73)	0.90
80–89	5/545	0.91	0.90 (0.36–2.22)	0.81
90+	2/37	5.40	5.47 (1.39–21.54)	<0.007
	63/6209			

Median age was 64 years (interquartile range 25–75% = 47–74 years). Distribution rate by age group showed a significance difference in the unplanned admission rate in patients 90 years or older (Table 3).

ASA Status was: ASA I 15 cases, ASA II 36 cases and ASA III 12 cases. No significance differences in the unplanned admission rate were found (Table 4).

Type of anaesthesia showed a significance difference in the unplanned admission rate in epidural procedures (Table 5).

Operations performed by surgical specialties are showed in Table 6.

Most of the causes of unplanned admission were surgical (64%) and the more frequent were infection, bleeding and pain (Table 7).

Median lapsed time before admission was 6.5 days (interquartile range 25–75% = 2–13 days) (Fig. 2).

Median hospital stay was 3 days and the mode was 1 day. Mortality rate was 0.03%. There were two patients:

1. Woman of 76 years old with irradiated uterine cervix tumor. A biopsy of cervix was performed and then she was admitted for sepsis at 11th day postdischarge and died at 7th day post admission.

Table 4
Unplanned admission rate by ASA status

ASA status	Number of patients	Unplanned admission rate	Relative risk (95% confidence interval)	P-value
I	15/1699	0.88	0.90 (0.51–1.59)	0.72
II	36/3612	0.99	0.96 (0.58–1.57)	0.86
III	12/898	1.33	1.54 (0.84–2.82)	0.16
	63/6209			

Table 5
Unplanned admission rate by type of anaesthesia

Type of anaesthesia	Number of patients	Unplanned admission rate	Relative risk (95% confidence interval)	P-value
General	20/2053	0.97	0.94 (0.56–1.60)	NS
Spinal	17/1607	1.05	1.06 (0.61–1.84)	NS
Epidural	15/285	5.26	6.50 (3.68–11.46)	<0.0000001
Local + intravenous sedation	0/506	0	–	–
Brachial plexus block	1/244	0.40	0.39 (0.05–2.83)	NS
Local	10/1514	0.66	0.59 (0.30–1.15)	NS
	63/6209			

Table 6
Postdischarge unplanned admissions by operations performed

General surgery	Six laparoscopic cholecystectomy
	Six inguinal hernioplasty
	Five haemorrhoidectomy
	Three eventroplasty
	Two umbilical hernioplasty
	One femoral hernioplasty
	One anal abscess
Urology	One anal sphincterotomy
	Six shot weaver lithotripsy (SWL)
	Four transurethral resection of bladder tumour
	Two orchidectomy
	Two hydrocelectomy
Gynae	One ureteroscopy
	One cervix biopsy
	One breast biopsy
	One mastectomy
Orthopaedic	One laparoscopic quistectomy
	Four arthrovideoscopy
	One hallux amputation
	One dupuytren disease
ENT	Two internal fixation
	Two amigdalectomy
Ophthalmology	Three cataract surgery
	One retinopexy
	One strabismus surgery
Vascular surgery	One arterio-venous fistula
	One saphenectomy
Paediatric	Two inguinal hernioplasty

2. Man of 86 years old. An inguinal hernioplasty was performed and then at 2nd day postdischarge he was admitted with an acute abdomen. He was submitted to laparoscopy and a purulent diverticular peritonitis was found. A Hartmann's procedure was performed. At 4th day postadmission he died of sepsis.

6. Discussion

We think that the postdischarge unplanned admission rate is a good clinical indicator for quality control in ambulatory surgery programmes, but not the only one. Other parameters such as substitution index, unplanned overnight admission

index, morbidity, mortality, patient satisfaction and cost are very important too [1–10,12,14,16].

Both major and minor ambulatory surgery rates are different in each surgical specialties. The postdischarge unplanned admission rate in minor ambulatory surgery is very low. We think that the analysis of this clinical indicator must exclude these minor procedures. This way it will allow more reliable evidence to be obtained. Comparison between the institutions, inside institutions and among the surgical specialties requires defining key demographic elements whose identification for now remains a challenge [4]. Retrospective studies are important but we believe that prospective research should be the way forward. Given the progress of evidence-based medicine, surgeons should not distance themselves from these activities, which will have a great influence on health care in this century [17].

We found that 75% of the patients were admitted 2 or more days postdischarge (Fig. 2). Most postdischarge unplanned admissions could not be avoided even with an ambulatory surgery programme with extended recovery (i.e. patient including overnight stay before discharge the following day) [8]. On the other hand, we do not now what the

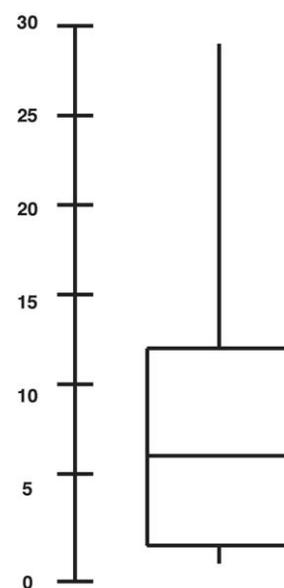


Fig. 2. Lapsed time before admission. Median 6.5 days; interquartile range 2–13 days, 2–13 days; range 1–29 days.

Table 7
Reasons for admission (N = 63/6209)

Surgical	N	Medical	N	Anaesthetic	N	Others	N
Wound bleeding	3	Acute myocardial infarctation	4	Headache	2	Fever	2
Wound haematoma	2	Pneumonia	3	Acute urinary outflow obstruction	1	Upper gastrointestinal bleeding	1
Haemarthrosis	1	Pulmonary embolism	2	Pneumothorax	1	Lower gastrointestinal bleeding	1
Renal haematoma	1	Deep venous thrombosis	2			Diverticular peritonitis	1
Anexial haematoma	1	Stroke	1				
Scrotal haematoma	1	Acute pulmonary oedema	1				
Haematuria	2	Tuberculous meningitis	1				
Anal abscess	1						
Scrotal abscess	1						
Wound infection	7						
Infection urinary tract	5						
Endophthalmitis	2						
Overcorrection poststrabismus surgery	1						
Postoperative biliary ascites	1						
Intestinal obstruction	1						
Renal colic	3						
Pain	6						
Sepsis	1						
	40 (64%)		14 (22%)		4 (6%)		5 (8%)

postdischarge unplanned admission rate is following inpatient surgery. There is a dearth of well-controlled, randomized studies comparing inpatient and ambulatory surgery.

We agree with Greenburg et al. [4] and we think that research needs to be undertaken to analyze the true predictive value of the surgical procedure on postdischarge unplanned admissions. Surgical techniques are not always comparable and other variables such as different surgical specialties and surgeons and illness status should be taken into consideration [4–7,11,13,17].

Anaesthetic induced complications have little influence on the postdischarge unplanned admission rate and our study only found a significant difference with epidural procedures. One report [15] shows spinal procedures as a significant risk factor. We consider that more research is necessary to obtain more reliable evidence.

7. Conclusions

1. The Postdischarge unplanned admission rate is relatively low.
2. Urology, gynaecology and general surgery and 90 years or older patients and epidural anaesthesia are significant risk factors on postdischarge unplanned admission.

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A Direct Booking Hernia Service – A shorter wait and a satisfied patient

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Received 30 July 2005; accepted 19 September 2005

Available online 16 November 2005

Abstract

Introduction: Patients requiring routine operations often have lengthy waits for outpatient appointments and surgery. Our aim was to reduce this wait by offering patients a Direct Booking Hernia Service and to assess its efficacy and its acceptability to patients.

Methods: Two groups of patients referred for treatment of an inguinal hernia were compared. Group 1 were those referred to a single named consultant and all those referred without specifying a consultant's name during the same period. Group 2 were those referred to any other named consultant at the same hospital during the same period. For those in Group 1, the referral letter was triaged by a single surgeon and sent directly to the Day Surgery Unit (DSU). The patient's first appointment was for nurse led pre-assessment in the DSU. At the same visit the duty DSU surgeon checked the hernia to confirm the diagnosis. If medically fit, patients were offered a date for operation within 4 weeks of their pre-assessment. If unfit for DSU, the nurses would discuss the patient with the DSU lead anaesthetist and could book them directly onto an inpatient list or refer them to the outpatient clinic. Group 2 patients followed the traditional pathway of outpatient clinic, then booking for surgery. Group 1 patients were invited to complete a patient satisfaction questionnaire following their treatment.

Results: There were 74 patients in Group 1 and 147 in Group 2 during the study period. In Group 1 3/74 (4.1%) did not have hernias at pre-assessment. The mean total waiting time from referral to surgery was 70 days. In Group 2 the mean wait for an out-patient appointment was 77 days, and the wait from outpatient appointment to surgery was 84 days, giving a total average waiting time of 161 days. The proportion of patients treated as day cases was 88.7% in Group 1 and 70% in Group 2. 43% of Group 1 patients responded to the questionnaire. 94% of these would recommend the service to a friend.

Conclusion: The Direct Booking Hernia Service provides an efficient way of treating patients requiring inguinal hernia repair that is acceptable to patients. It significantly reduces waiting times and reduces the load on outpatient appointments.

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Keywords: Direct Booking; Inguinal hernia repair; Waiting times; Patient satisfaction

1. Introduction

Inguinal hernia repair is one of the commonest general surgical procedures; there are approximately 113,000 new cases of inguinal hernia per annum [1]. Patients requiring such routine operations often have lengthy waits for outpatient appointments and surgery.

The current NHS Plan aims to reduce routine waits to 3 months for outpatient appointments and 6 months for surgery

by 2005 [2]. In addition, national guidelines recommend an increased proportion of hernia repairs be performed as day cases [3]. Such surgery has been shown to be safe, efficient, economical and convenient [4]. Currently, there is a very low overall UK wide day case rate of 20% [5].

It has been suggested that there is relatively little evidence of best practice in place within the NHS; safe and simple pathways are required to manage this large group of patients [6]. Regarding surgical technique, a recent review suggests that the open, tension free mesh repair gives the most consistent good results [7]. However, there appears to be little consistency regarding the management prior to and after surgery.

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This study aimed to set up a Direct Booking Hernia Service and then to compare patients' waiting times for surgery with those receiving the more traditional service. In addition, patient satisfaction with this service was assessed.

2. Methods

Following a pilot study in which six local general practitioner (GP) practices used a faxed referral/booking form (National Booked Admissions Programme) for inguinal hernia repairs, the surgical department decided to assess the effectiveness of a Direct Booking service for patients with inguinal hernias.

The study group (Group 1) included all patients referred to a single named consultant and all patients referred without specifying a named consultant. The process involved the consultant triaging 'Dear Doctor' hernia referrals. All those with a clear diagnosis of primary inguinal hernia were entered into the 'Direct Booking' service, with no age or co-morbidity discrimination. Patients entered a pooled waiting list, rather than waiting for a named consultant. Recurrent hernias, bilateral hernias and uncertain diagnoses were excluded. The patient's first attendance was at the Day Surgery Unit (DSU) for nurse led pre-assessment. At this appointment a protocol driven assessment was made and the duty DSU surgeon confirmed the diagnosis. For those with no hernia the patient was referred back to the outpatient department (OPD) or to the GP as appropriate. Written information about the operation and DSU was given to each patient and surgery followed within 4 weeks. Patients who were deemed unfit for DSU were booked for in-patient management after discussion with the consultant anaesthetist DSU lead, or referred back to OPD if unfit for anaesthesia.

Repair of the hernia was by the open, tension-free, mesh technique in all cases. The surgeon reviewed patients post-operatively in the DSU and they were discharged with written advice, contact details and analgesia. Follow-up was by telephone on day 1 post-operatively. Patients were not routinely seen in the outpatient clinic following their surgery.

A retrospective study was undertaken of all inguinal hernia repairs performed at the Whittington Hospital between October 2001 and January 2003. Patients managed with the Direct Booking service (Group 1: 74 patients) were compared with those referred to other named consultants and subsequently seen in the outpatient clinic (Group 2: 147 patients). All patients booked for inguinal hernia repair via Group 1 or Group 2 were pooled and booked onto the first available list of any general surgeon. For each group, the length of wait from referral to operation was determined. Statistical analysis was performed using a *t*-test (Table 1).

To further assess the Direct Booking service, a postal satisfaction questionnaire was sent to all the patients in Group 1 independently after their treatment (Appendix A). This comprised questions relating to waiting times, their assessment,

Table 1
Summary of data for both groups

	Study group	Control group
Number of patients	74	147
Age range (mean age)	23–89 years (47.2)	22–79 years (50.5)
Mean waiting time for surgery	70 days	161 days
Proportion treated as day cases	89%	70%

the operation and the post-operative period, and their satisfaction with the Direct Booking service.

3. Results

A total of 221 patients were included in this study. Seventy four of these (Group 1) were offered the Direct Booking service and 147 (Group 2) were managed traditionally via the outpatient clinic. There was no significant difference in the ages of Group 1 (47 years) versus Group 2 (50 years) patients.

The mean waiting time from referral to surgery in Group 1 was 70 days (range 10–177). This was significantly shorter than the total wait for the control group. In Group 2 the mean wait for an outpatient appointment was 77 days (range 35–136) and the mean wait for surgery was 84.2 days following the outpatient visit (range 28–105), totalling 161.2 days ($p < 0.05$).

A significantly greater number of hernia repairs were performed as day cases in the study group (89%) than in the control group (70.0%).

Of the study group, 3/74 (4.1%) did not have hernias at pre-assessment. 10/74 (13.5%) patients did not attend pre-assessment and 5/71 (7.0%) patients did not attend (DNA) surgery. This compares with a previous overall DNA rate of 10%. 8/71 (11.3%) patients were found to be unsuitable for day case surgery. No patients were cancelled on the day of surgery.

Thirty-two (43%) patients responded to the satisfaction questionnaire. 84% felt that the waiting time for surgery was 'about right'. 81% found it useful to meet a nurse before the operation and 91% felt they had had all their questions answered before the operation. 6% (two patients) who had further questions returned for an outpatient visit to obtain further information. 94% would recommend the service to a friend.

4. Discussion

Patients had a shorter wait for surgery when booked directly. This would be expected in view of the fact that the wait for an outpatient appointment had been removed. In doing this, the load on outpatient clinics is reduced, and as a result there is greater availability, and indeed a shorter wait, for patients requiring assessment. This would help in achieving the goals set out in the NHS Plan [2].

The Direct Booking Hernia Service has been successful in reducing waits for surgery. Comparisons can be drawn to a similar service offered by many hospitals with respect to ‘lumps and bumps’ where patients attend minor operations lists directly.

The patient survey gave promising results although the response rate was only moderate. This may be because the patients were not pursued a second time if they failed to respond on the first occasion, or may be related to the relatively mobile nature of our local population. No complaints or criticisms of the Direct Booking Hernia Service have been received by the Patient Advocacy and Liaison Service. Most importantly, the patients who responded felt that they were adequately informed prior to surgery. This would be one of the greatest potential concerns in removing the outpatient visit prior to surgery, but it has not been demonstrated to be a significant issue in this survey, perhaps because we give specific written patient information leaflets regarding the procedure, the anaesthetic options, DSU and post-operative analgesia. In addition the patients still see a surgeon at the time of pre-assessment, so that the pros and cons of proceeding with surgery can be discussed.

The day case operating rate with our direct booking group (89%) was higher than the traditional group (70%). This satisfies national guidelines, but still falls short of the results reported by other centres; a public hospital in Denmark reported a day case rate as high as 98% [8]. Effort is required to aim for such a rate; this would both suit patients and indeed hospitals, where shortage of inpatient beds is a common occurrence [9]. The high day case rate in the present study is probably because day surgery was the “default option” in the patient pathway.

Some centres have described a ‘one stop’ approach to inguinal hernia management in which patients are assessed and treated at a single hospital appointment [10]. This effectively eliminates the pre-operative assessment visit. It is reliant upon examination and investigations arranged by the general practitioner, and in some cases, telephone consultations. Whilst satisfactory results were reported, 4 out of 98 patients (4%) were cancelled on the day of surgery, on medical grounds (no, hernia, bilateral hernia and medically unfit). The Direct Booking service had no cancellations on the day of surgery. In view of waiting list pressures and limited operating time, all measures should be taken to avoid cancellations on the day of surgery. Therefore, it is felt that the pre-operative assessment is of value, both to address any of the patient’s enquiries and to ensure that the patient is suitable.

Since this study has been completed all surgeons at the hospital have converted to using the Direct Booking Hernia Service for all patients referred with a definite diagnosis of inguinal hernia.

5. Conclusion

The Direct Booking Hernia Service provides an efficient and safe way of managing patients referred for inguinal hernia repair. It significantly reduces waiting times, offering a date for surgery in an average of 70 days of referral, and also reduces the burden on the outpatients department. It has the added benefit of increasing the proportion of patients who have their operations as day case procedures.

Appendix A. Direct access hernia service questionnaire

Please complete this questionnaire by placing a cross in the boxes provided.

1. Waiting Time

The waiting time for the operation was:

- Too short
 About right
 Too long

Would you rather see a surgeon in clinic before deciding whether or not you wanted an operation?

- Yes
 No

2. Assessment

Meeting a nurse before the operation was:

- Very helpful
 Neither helpful nor unhelpful
 No help at all

The wait to see the surgeon in the assessment clinic was:

- Too long
 About right
 Too short

Did you feel that you had all your questions answered before the operation?

- Yes
 No

3. The operation

The pain after the operation was:

- Less than I expected
 About what I expected
 More than I expected

Did you have to come back to clinic because of any problems after the operation?

- Yes
 No

If so, what problem did you have?

Did you have to visit your GP because of any problems after the operation?

- Yes
 No

If so, what problem did you have?

4. Day Case Surgery

Coping at home after the operation was:

- Easier than I expected
 About what I expected
 Harder than I expected

Would you have preferred to stay overnight in hospital?

- Yes
 Don't mind
 No

5. Follow up

Did you get a call from the day surgery unit the day after your operation?

- Yes
 No

If so, was this

- Helpful
 Neither helpful nor unhelpful
 Not helpful

Would you have preferred to come back to see the surgeon in clinic after your operation?

- Yes
 Don't Mind
 No

6. Improvements

The amount of information given about the operation was:

- Too much
 About right
 Too little

Would you recommend our Day Surgery Unit to a friend with a hernia?

- Yes
 No

Is there anything we could do to improve our service for patients needing hernia operations?
 (Please write below).

Thank you for taking the time to complete this questionnaire. Please return it in the envelope provided.

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Cancellations in ambulatory day surgery: Ten years observational study

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Received 25 June 2005; accepted 19 September 2005
Available online 15 November 2005

Abstract

Background: Reasons for cancellation of booked procedures in ambulatory surgery need a detailed analysis in order to introduce corrective measures to lessen them.

Methods: Cancellations occurring the day before operation without patient replacement and procedures cancelled on the day of operation in 10 500 patients scheduled to be operated on in a multidisciplinary ambulatory surgery unit were analysed. Data were obtained from the incident register sheets and the database of the unit.

Results: A total of 424 patients were cancelled (4%). Reasons for cancellation were: acute medical conditions in 23.3% of cases, personal decision of the patient to refuse programming in 22.2%, non-attendance in 2.1%, failure to follow pre-operative guidance in 23.3% and unavailability of resources in 29%. These causes were preventable or possibly preventable in 57.1% of cases, difficult to prevent in 29% and not preventable in 13.9%.

Conclusion: More than half the cases of cancellation could be prevented. A rapid response of surgical departments to substitute patients, campaigns to increase the awareness of the population about the cost of health services and the implementation of pre-operative assessment guidelines must be considered.

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Keywords: Ambulatory surgery cancellations; Day surgery cancellations; Cancelled procedures

1. Introduction

The absolute need for a better use of health resources obliges the study of problems such as cancellations in elective and ambulatory surgery. The rate of cancelled procedures is not negligible in reported series and has important economic outcomes in western countries [1,2], because of operating room time waste, increase in pre-operative rework with additional associated expenditure and for its impact on patient waiting lists. Patients and their families can also be affected both economically and emotionally. Ambulatory surgery is an expanding practice worldwide in public health services, but is affected by the same problem despite proper patient selection for this type of surgery [3]. Among the various reasons leading to cancellations, inappropriate organization of

programming, incorrect pre-operative patient evaluation and outdated appointment systems must be considered and corrected. Causes related to patient attitude and mindset, have little possibility of improving without considering a publicity campaign in order to alert the population about the true costs of public health systems.

The aim of this observational study is to analyse the causes of cancellation of booked procedures in a multidisciplinary ambulatory surgery unit during 10 years, in order to allow surgeons, anaesthetists, nurses and administrators to introduce corrective measures.

2. Patients and methods

Our ambulatory surgery unit is integrated in a university general hospital with independent physical facilities. Admission area, pre- and post-operative holding area for 12 patients, registered nurse's office and nursing station, two operating

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rooms and a recovery area have a round architectural distribution. After a temporary proving period from 1995 to 1999, the unit began its normal work, reaching 1500 patients per year in 2003. A total of 10 500 patients were scheduled to be operated on in the studied period of 10 years. Patient selection was done by surgeons in according to procedures suitable for day surgery treatment in general surgery, ophthalmology, orthopaedic surgery, urology, ENT surgery, vascular surgery and plastic surgery, patient physical status related to the American Society of Anaesthesiologists (ASA) classification (ASA 1, 2 and stable 3) and social environment (availability of a responsible adult, phone access and residing within an hour travelling time from the hospital). Selection was also assessed by anaesthetists according to a detailed clinical history, physical examination and appropriate pre-operative tests. Programming of surgery was done weekly following priority criteria, waiting list status and surgical speciality. Patients were notified by phone twice, 1 week before the operation and the day before. A definitive phone call was made by nurses from the unit, to confirm the appointment, to verify the physical status of the patient and to give instructions related to the operation and the stay in the ambulatory surgery unit. After operation, patients were discharged from the unit following the Post Anaesthesia Discharge Scoring System (PADSS) developed by Chung et al. [4] in 1995. Clinical data from admission up to the 30th post-operative day were included in a database created with Stat-View 5.0.1 for Windows, 1992–1998, SAS Institute Inc. Cary, NC 27513. If a procedure was cancelled the day before operation and substituted by another patient from the list, this was not considered a cancellation. However, cancellations occurring the day before operation without patient replacement and cancellations on the day of operation were considered as cancelled procedures.

Data from the cancelled procedures were obtained from the incident register sheet of the weekly surgical booklet and the clinical database of the unit. Descriptive statistics were

used in the analysis. Different causes of cancellation were considered in the study with no-comparison.

3. Results

Out of 10 500 patients scheduled to be operated on in the day surgery unit, 424 were cancelled (4%). In 210 cases (2%) cancellations were done the day before the operation without substitution and in 214 cases (2%) on the day of operation. Cancellation rates varied from 1.9% in 1996 to 6.1% in 2002 (Fig. 1). There was a small seasonal variation: 3% for spring, 4.2% for autumn and 4.9% for winter. In summer time, no activity in the ambulatory surgery unit was scheduled. Considering only surgical specialities, treating more than 500 patients in the analysed period of time, cancellation rates varied from 2.8% in urology to 5.2 in vascular surgery (Fig. 2).

Reasons for cancellation were divided into five groups: (1) acute medical conditions: 99 cases (23.3%), (2) personal decision of patients to refuse programming: 94 cases (22.2%), (3) non-attendance: 9 cases (2.1%), (4) failure to follow pre-operative guidance: 99 cases (23.3%), and (5) unavailability of resources: 123 cases (29%). Among the reasons included in acute medical conditions, more than 50% of the cases were due to upper respiratory tract infections and the remainder were related to anxiety, fever or poorly controlled high-blood pressure. When considering the personal decision of the patients to refuse scheduling, the majority of them (80 cases) did it the day before operation, and 14 cases on the day of operation, mainly because of family, social or professional events. The main group of causes for cancellation, unavailability of resources, grouped reasons like health workers on strike, medical team unavailability, equipment repair or failure, overbooking of day surgery unit beds occupied for general emergencies and shortage of operating room time (Fig. 3).

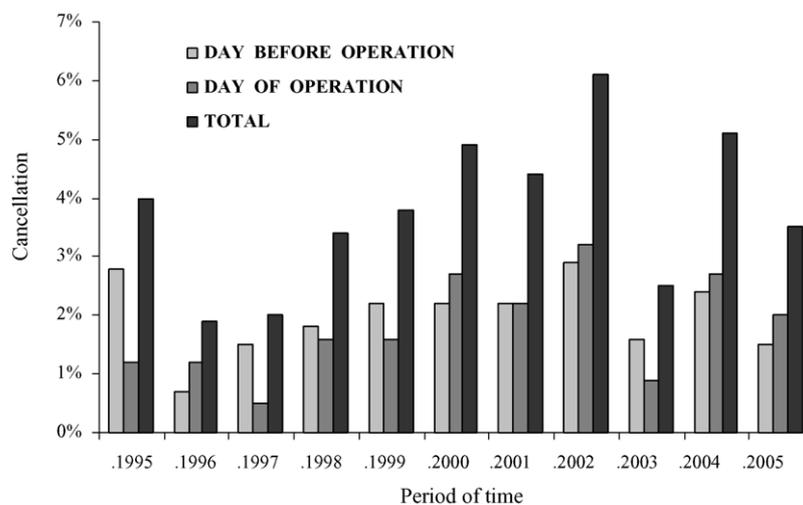


Fig. 1. Cancellation rates in the studied period of time.

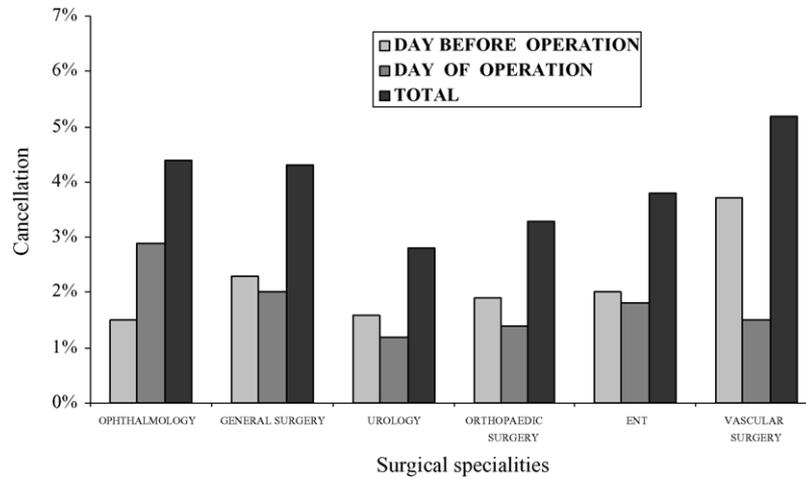


Fig. 2. Cancellation rates according surgical specialities.

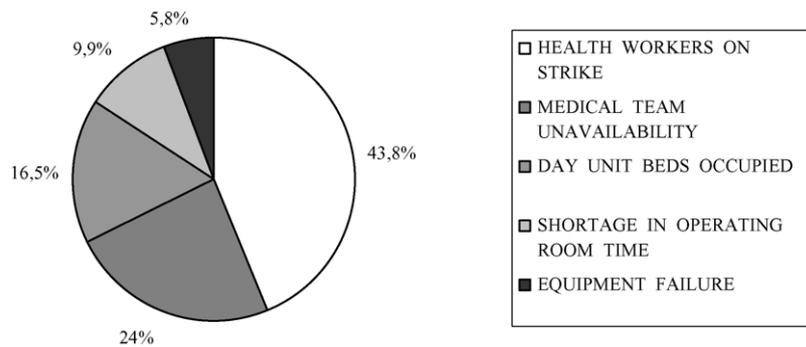


Fig. 3. Reasons for cancellation. Resource failure.

When considering surgical specialities and the reasons for cancelling in each, we found a high rate in vascular surgery (5.2%) mainly caused by coincidental strike or occupied bed places at the scheduled time. Cancellation rates above average was encountered in ophthalmology patients (4.4%), mainly due to unavailability of resources in two-thirds of the cases

Table 1
Distribution of reasons for cancellation in ambulatory surgery depending on the possibilities of prevention

	Number of cases	%
Preventable	219	51.7
Acute medical reasons the day before operation	40	9.4
Personal decision of patients the day before operation	80	18.9
Pre-operative work-up not followed	99	23.4
Possibly preventable	23	5.4
Personal decision the day of operation	14	3.3
Non-attendance of patients	9	2.1
Preventable with difficulty (resources not available)	123	29
Non-preventable (acute medical conditions the day of operation)	59	13.9

and to acute medical illness in the remaining third and in general surgery patients (4.3%).

Distributing cancellation causes into the classic four groups, based on difficulty in prevention, we found that more than 57% could be preventable (acute medical conditions appearing the day before the operation, personal decision of patients the day before as well as failure to follow pre-operative guidance) or possibly preventable (private decision of patients the day of operation or non attendance). The rest of the causes were difficult to prevent (resources unavailable) or not preventable at all (acute medical conditions on the day of operation) (Table 1).

4. Discussion

The cancellation of surgical procedures is such an important problem in health care delivery that institutions like The United Kingdom Parliament [5], The Modernisation Agency of the National Health Service [6] (NHS), or Insalud [7], Sistema Nacional de Salud (SNS) in Spain, have published their concern and recommended analysing the causes and have suggested introducing corrective measures. Reports from highly developed countries such as the USA [8,9]

and Norway [1] show cancellation rates from 10 to 17% in elective surgery. The Australian Council of Healthcare Standards and the Australian Day Surgery Council identified clinical indicators for application to day surgery centres and attached day surgery units within hospitals. In their users' manual version 3, edited in 2001 [10], four indicators were pointed out. The first was—cancellation of booked procedures—including four circumstances: (1) patients who fail to arrive, (2) cancellations due to pre-existing medical conditions, (3) cancellations due to acute medical conditions, and (4) cancellations due to administrative/organizational reasons. This interest in monitoring cancellations in day surgery is related to the surgical procedures on an ambulatory basis being affected by the same problem of cancellations as elective surgery. Some reports state rates of 10–13% [3,11], somewhat less than in elective inpatient surgery. In our hospital, the rate of cancellations in elective surgery was 6.4% in 2004, including only same day cancellations. That year, day surgery registered 5.1% of cancelled operations including both cancellations occurring the day before operation and on the day of operation. This percentage was one of the highest from 1995, the average being 4% during the period of time studied.

In outpatient surgery, higher rates of cancellation are reported in urology and dental procedures and lower rates in orthopaedic and paediatric surgery [8,9]. Our experience is quite different. Vascular surgery with 5.2% and ophthalmology with 4.4% have a higher than average cancellation rate. But we must consider the impact in these results of the coincidence of unavailable resources at scheduled dates for vascular surgery and unavailable resources and acute medical conditions when considering ophthalmology because an older age patient group is involved.

We observe, as others, that more than 50% of cancellations could be prevented [11]. It is our opinion that 57.1% of cancellations are preventable applying the correct measures, but the remaining 42.9% will be difficult to prevent because it seems unlikely to be able to avoid the occurrence of acute medical conditions in patients on the day of operation and because public administration is not likely to increase expenditure on health care delivery in the near future.

The occurrence of acute medical conditions in our patients produced 23.3% of all the cancellations. This is not surprising because surgical specialties such as ophthalmology deal with an older patient group, as mentioned. We must also consider that in winter, upper respiratory infections are frequent and interfere with day surgery programming. However, in one-third of cases, cancellation was known the day before operation but patients failed to be replaced. A more efficient response from surgical departments could allow the substitution of patients and would have avoided 9.4% of all cancellations.

The SNS [7] highlights that patient cancellations occur more frequently in hospitals with a higher rate of cancellations. This reason for cancellation is registered in 22.2% of our cases and was related to specific troubles associated with

family, workplace or personal change of mind about the decision to be operated on. As in the case of occurrence of acute medical problems, the majority of cancellations were known on the day before operation and a rapid substitution could have avoided as much as 18.9% of cancellations. In our opinion, patient cancellations would decrease even more if public oriented campaigns based on the real cost of health delivery systems and on the limits of economic resources were applied in countries like Spain where the SNS treats more than 95% of the population.

In the Theatre Programme of the NHS Modernisation Agency, piloted from August 2001 to June 2002, non-attendance of patients was the highest reason of patient cancellations in day surgery (23%) [6]. This cause of cancellation was not frequent in our day surgery unit (2.1%), probably because the way of notifying our patients of the date for operation. Patients receive two phone calls, the first from the admission department, 1 week before and the second one directly from the day surgery unit, the day before operation. Nurses use this second call to confirm attendance of patients and is extremely helpful, not only to know the physical condition of the patient, provide useful instructions for the pre-operative period about fasting, pre-operative drug consumption, time of arrival, number of relatives allowed in the recovery area and advise about concerns and fears, but certainly to begin a close relationship with patients, in order to obtain their confidence and for a more gratifying and successful outcome. Basu et al. [12] have demonstrated as well that patient questionnaires along with telephone screenings are very effective in reducing cancellation rates in day surgery.

The NHS Modernisation Agency advises the implementation of a pre-operative assessment to decrease the number of patients who do not attend [6] and this recommendation is supported by others [13–17]. The introduction of outpatient pre-operative evaluation, pre-assessment clinics, pre-clerking clinics or pre-admission evaluation centres has an important role to play in reducing cancellations not only in day surgery but in all elective surgery. All of these facilities allow a complete preparation of patients for surgery. A complete history and appropriate physical examination, followed by laboratory testing, chest radiographs and electrocardiographic evaluation related to ASA classification, gender and age of patients, a suitable selection of surgical procedures and the evaluation of patients' environment, should form the pre-operative assessment for day surgery. Furthermore, if a patient is suitable for day surgery, the preparation should include information provided by the surgeon and anaesthetist, about the surgical procedure and the pre-operative process.

At the beginning of our experience in day surgery, we reached an agreement among anaesthetists, surgeons, nurses and hospital managers, about the criteria and guidelines to follow in the selection of patients suitable for day surgery. Divergences appeared during the last years and the publication in Spain of consensus recommendations between surgical and anaesthetic associations [18], forced an agreement revision in 2003 focused princi-

pally on the selection of cost-effective pre-operative testing for different risk groups of patients and the period of their validity. With this change, we hope to avoid some 23.3% of cancellations due to failures in the pre-operative assessment and improve the cost efficiency of ambulatory surgery.

The unavailability of resources has been the most important group of reasons for cancellation in the study (29%). Heterogeneity of this group and the difficulty in introducing any improvement need a detailed analysis. Labour conflicts between health workers produced nearly half the cancellations included in the unavailable resources group. When a strike involves health workers of a surgical division, day surgery patients always suffer cancellation of their procedures due to the low priority of this type of surgery. Possibilities of changing this situation are nil because day surgery never will be considered as a so-called “priority service” during strikes. The unexpected prolongation of operating time may lead to cancellation of the last scheduled operations of the day. Although this situation is infrequent in our series (12 cases), a better relationship among surgeons, anaesthetists, nurses and managers could avoid these cancellations. Unavailability or maintenance of equipment is also infrequent (9 cases) and permits little improvement due to its nature. However, when the unavailability of resources is related to day surgery facilities being disrupted by unexpected emergencies, or medical teams are unavailable due to the interference of special programmes like organ transplantation, an important concern and debate appears. We have registered this incidence in 49 cases. With the purpose of dealing with a situation producing augmentation of current waiting lists, some ideas are being implemented in the UK, i.e.: the introduction of independent 24 h surgery units for elective procedures, diagnostic and treatment centres separated and protected from general emergency units and beds specifically ring fenced for routine operations [5]. In all cases, these plans need new resources and support and the published evidence does not show so far a clear increase of hospital efficiency. Reports from Norway [1,19] conclude that ring fenced day surgery units have 60–75% higher work efficiency than day surgery units without ring fencing, but the results at hospital level are discouraging because the positive effect observed in cost efficiency, ranging from 0.4 to 1.9%, is statistically insignificant. There is no doubt that plans to improve the availability of resources need a bigger investment in health and this is a subject for social and political debate, not for professional discussion.

In conclusion, in the current series, more than half the cases of cancellation could have been prevented. A prompt response of surgical departments involved in order to substitute patients already scheduled is encouraged. Public oriented information campaigning directed to increase population awareness about the real cost of health services and the implementation of guidelines for pre-operative evaluation of

patients must be advised to achieve these goals. All other cancellations need changes in the surgical division organization and additional funding for Public Health System hospitals.

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Give the patients the choice—The ‘walk in walk out’ hernia clinic

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Received 28 June 2005; accepted 19 September 2005

Available online 28 November 2005

This work was presented to the ASGBI and IAAS in April 2005 and was sponsored by NHS Elect and Tyco healthcare.

Abstract

Background: Patients referred with symptomatic inguinal hernias traditionally make at least three visits to the hospital and wait on average 41–53 weeks for their operation. Approximately, 10–15% of patients either do not attend (DNA) their clinic appointment, attend on the day of operation or are cancelled by the hospital due to bed shortage, lack of theatre space or associated co-morbidities. This results in a significant psychological strain on the patients and a financial drain on NHS resources.

Aims: To set up a hernia service within the confines of the NHS and give patients the choice of having their hernia repaired under local anaesthetic with only one visit to the hospital, on a date of their choosing, as in private hernia centres but without incurring the cost.

Patients and Methods: An e-mail containing two detailed proformas, “suitability criteria” and “instructions for patients” was sent to each general practitioner (GP) referring hernia patients to the North West London Hospitals NHS Trust (Northwick Park and Central Middlesex Hospitals). The GP gave each suitable and willing patient the instructions booklet and faxed a referral letter to the consultant's (RPB) scheduler. Patients were advised to read the instruction booklet and, when ready, ring the scheduler to make an appointment for a date of their convenience for the consultation and operation at the same visit.

Results: Ninety patients have been referred to the ‘walk in walk out’ (WIWO) clinic in the last 6 months. Ninety one percent of these patients have had successful ‘tension free’ open mesh repair under local anaesthetic. There were five (6%) inappropriate referrals (recurrent or bilateral hernias), and three patients (3%) did not attend their appointment due to ill health or family bereavement.

Conclusion: Patients with unilateral primary reducible inguinal hernias, regardless of their ASA status can safely have open ‘tension free’ mesh repair under local anaesthetic on a date of their choosing by making just one visit to the hospital. In just 6 months this ‘WIWO’ hernia clinic has shown a high level of patient satisfaction, significant reduction in ‘did not attend’/cancellation rates and financial savings for the Trust. Similar clinics set up across the nation would multiply the benefits we have shown.

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Keywords: WIWO; Local anaesthetic; Inguinal hernia

1. Introduction

Inguinal hernia repair is one of the commonest general surgical procedures performed in the NHS today, with approximately 80,000 inguinal hernia repairs being performed each year in England [1]. About 40,000 patients per year are cancelled on the day of operation due to non-clinical reasons [2]. We estimate that a considerable number of patients with

co-morbidities are advised against surgery or are cancelled at the last minute because of the high risk associated with general or regional anaesthesia.

In our trust, an average of 10–15% of patients either do not attend on the day of surgery, because of lost letters, unsuitable dates or family commitments. A significant number of patients are cancelled by the hospital on the day of surgery either due to a shortage of inpatient beds, lack of operating space or because they are considered unsuitable for general or regional anaesthesia due to their associated co-morbidities. Patients categorized as American Society of Anesthesiologists (ASA) class III and IV do not fulfill the normal criteria

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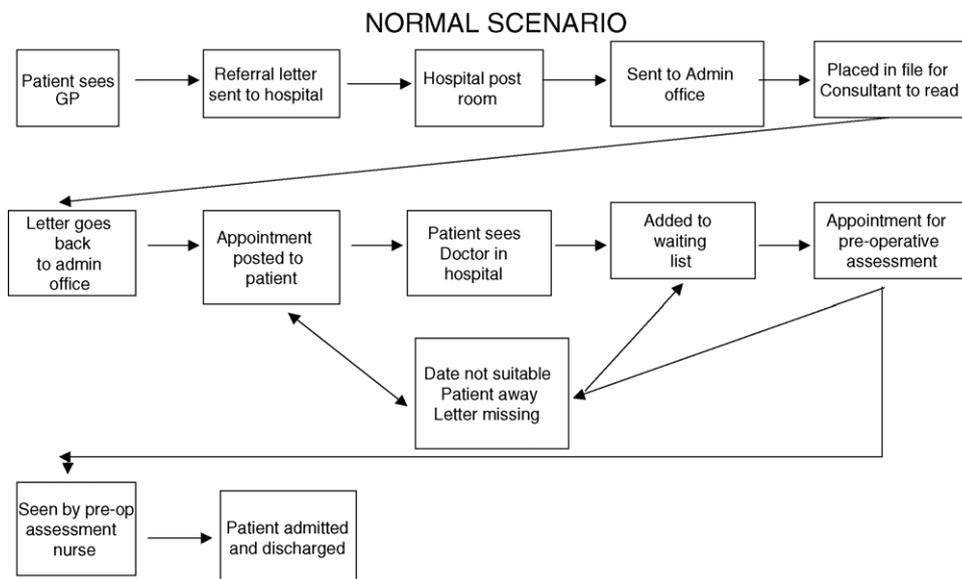


Fig. 1. The normal case scenario.

for day case surgery. These patients could have their hernia repaired under local anaesthetic in one of the private hernia centres at a cost of £1300. We believe that patients who can afford to pay for private healthcare would buy their treatment regardless, but a significant proportion of our patients cannot afford private health care and end up waiting and suffering.

The vast majority of patients in our trust still undergo inguinal hernia repair under a general anaesthetic despite several studies having reported on the benefits of inguinal hernia repair under local anaesthetic, such as shorter hospital stay, less post-operative pain, early mobilization and reduced mic-tur-tation problems [3–5]. In addition it allows the surgeon to test the quality of the repair at the time of surgery.

In the ‘normal case scenario’ (Fig. 1) a patient with an inguinal hernia would visit the hospital on at least three separate occasions, i.e. once to see a consultant, then for pre-operative assessment and finally for the operation. The average GP to operation time in our trust is 41–53 weeks. However, if patients are repeatedly cancelled on the day of surgery, there is no limit to their wait and suffering.

It was the desire to reduce these long waiting times and the suffering of one patient in particular, who had to sell a sentimental item to pay for private healthcare that prompted RPB to create the first ‘WIWO’ hernia clinic within the confines of the NHS. The aim was to give the patients the choice to organize the date of their own operation, have the hernia repaired under local anaesthetic and make only one visit to the hospital.

2. Patients and methods

In order to establish the ‘WIWO’ hernia clinic, each GP in the catchment area serving North West London Hospitals NHS Trust was e-mailed two proformas, entitled “instruc-

tions for patients” and “suitability criteria for the WIWO clinic” (Table 1).

Each GP usually referring hernia patients to the general surgical outpatients is requested to refer suitable patients to the WIWO hernia clinic by faxing a letter to the consultant’s scheduler. Suitable patients are given the choice of being referred to the WIWO clinic for their consultation and operation at a single visit.

Each suitable and willing patient is given the “instructions for the patient” booklet by their GP and advised to ring the consultant’s designated scheduler to make an appointment on a date of their choosing. Patients who do not fit into the criteria of the ‘WIWO’ clinic (Table 2) or wish not to be referred to the WIWO clinic are referred to the surgical outpatient clinic as in the normal case scenario.

On arriving at the clinic, patients are guided to a specified pre-operative area where a dedicated nurse completes their paperwork, performs their pre-assessment consisting only of routine measurements of pulse, blood pressure and

Table 1
Suitability criteria

Patients suitable for WIWO hernia clinic

- (1) Willing to have their hernia repaired under a local anaesthetic
- (2) Unilateral primary reducible inguinal, femoral and umbilical hernia
- (3) Small to medium build (BMI < 25)
- (4) Able to lie flat for 45 min

Table 2
Exclusion criteria

Patients not suitable for WIWO hernia clinic

- (1) Bilateral hernias
- (2) Recurrent hernias
- (3) Xylocaine or bupivacaine allergy

temperature, allays any fear they may have and answers their questions. Each patient is seen by the surgeon (RPB) who explains the procedure, its complications in detail and obtains informed written consent as well as answering any of their questions and their concerns. We encourage the next of kin to be present with the patient during this consultation.

The attending nurse walks the patient to the operating theatre. An intravenous cannula is sited on the dorsum of the hand and 1.5 mg of midazolam (Hypnoval) is administered intravenously by the surgeon, prior to the start of the operation. The surgeon uses a 60 ml mixture of 0.25% lignocaine with adrenaline (1:200,000) (maximum permitted is 7 mg/kg bodyweight) and 0.25% bupivacaine with adrenaline (maximum permitted is 4 mg/kg body weight) to induce a nerve and infiltration block. This combination is ideal for having both a rapid onset of anaesthetic effect due to the lignocaine and a long acting effect due to the bupivacaine. Each patient receives a single dose of intravenous antibiotic preoperatively, normally 1.5 g of Cefuroxime, but those with allergy are given an alternative. Prior to making the incision, the injected anaesthetic agents are massaged well into the area and enough time is given for them to take effect.

There is no designated anaesthetist scheduled to cover the list. In the rare event of a patient needing help with pain relief or anxiety, consultant anaesthetists from adjoining theatres would help. So far we have sought no anaesthetic help. Each patient undergoes standard Lichtenstein ‘tension free’ mesh repair. The prolene mesh is sutured to the inguinal ligament using 3/0 prolene interrupted sutures applied at three anchoring sites; pubic tubercle with mesh overhanging it, a mid-point between pubic tubercle and internal ring and just lateral to the internal ring itself. The mesh is stapled to the conjoint tendon using a Versatac stapling device (Tyco). The lateral tails of the mesh are overlapped behind the cord and stapled to one another.

The wound is closed in layers; the skin is closed using a subcuticular 4/0 PDS suture and a Tegaderm dressing is applied over the wound. The patient is allowed to have a shower 24 h after the operation, but the dressing is left in situ until a clinic appointment 2 weeks later. Patients are taken to recovery in a wheel chair and spend at average of 2–3 h in the recovery unit. Once they have eaten, passed urine and are comfortably mobile, they are allowed home with their relatives. They are encouraged to mobilize from the next morning, but are advised to avoid heavy lifting for 6 weeks postoperatively.

The attending nurse telephones the patients at home the next morning to ensure that they are well. In the rare event of a problem, the nurse will organize for the patient to be reviewed by the consultant within 24 h or sooner if required. This ‘open access’ approach has been found to be of great help in cementing the patient’s confidence and has made the clinic more acceptable to both patients and GPs alike.

Each patient is given a standard ‘satisfaction survey’ form at the time of discharge to be returned at their follow up appointment.

3. Results

In the WIWO hernia clinic we have reduced the complex web of the ‘normal case scenario’ (Fig. 1) to a two-stage approach (Fig. 2).

A total of 90 patients have so far been referred to this clinic in the last 6 months. 91% ($n=82$) (Fig. 3) have had their inguinal hernia repaired as per protocol. Five patients (6%) were referred inappropriately (four patients with recurrent inguinal hernias and one patient with bilateral inguinal hernias). Three patients (3%) did not attend their appointment, two due to ill health and one because of a family bereavement. These patients were advised to contact the scheduler, when they were ready for the operation. We did not have to cancel any patients except those referred inappropriately.

Of the 91% ($n=82$) of patients undergoing inguinal hernia repair we have recorded only two complications thus far. One patient developed a subcutaneous haematoma, following local trauma in the post-operative period. The patient made a full recovery following drainage of the haematoma in the outpatient clinic. The other, a patient with known benign prostatic hyperplasia, developed acute retention of urine necessitating catheterization and an overnight stay. The catheter

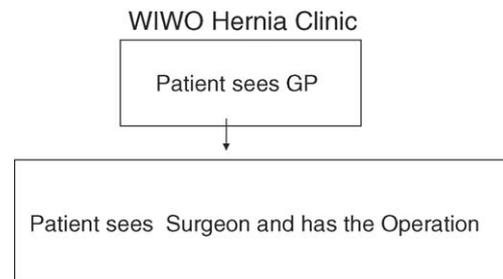


Fig. 2. The ‘walk in walk out’ hernia clinic.

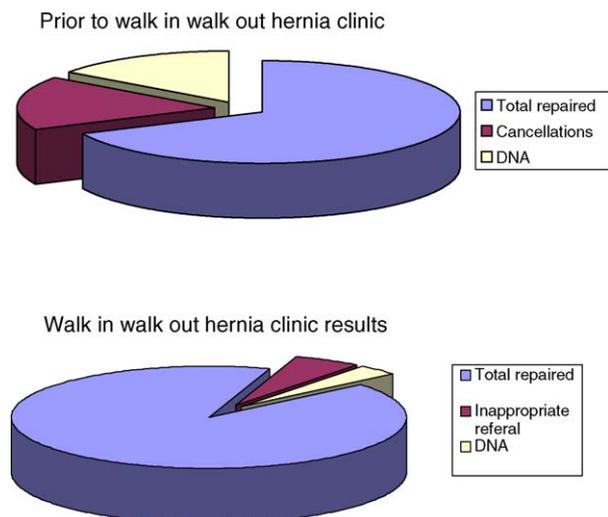


Fig. 3. Results of the ‘WIWO’ hernia clinic compared to the year before the clinic commenced.

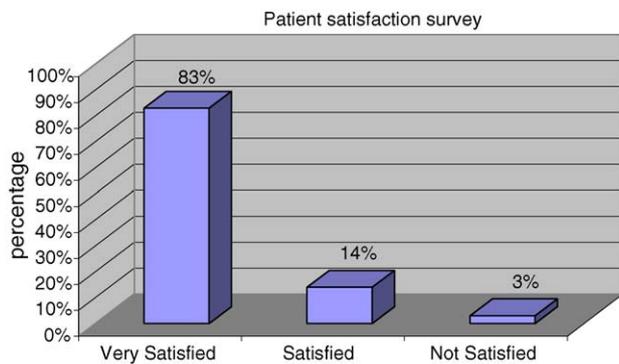


Fig. 4. The patient satisfaction survey.

was removed the next day following which the patient was able to void normally and was discharged home.

Only 87% ($n = 71$) of the 'satisfaction survey' proformas have been returned. Nearly 83% ($n = 59$) of these 71 patients were very satisfied and 14% ($n = 12$) were satisfied with their treatment (Fig. 4). Only two patients were not totally satisfied with the service.

4. Discussion

Given the current set up in the NHS, patients with inguinal hernias make several unnecessary visits to the hospital, wait for protracted periods to get onto a waiting list and wait on average 137 days for inguinal herniorrhaphy. Although considered by many as a 'minor' ailment inguinal hernias can cause significant physical and psychological morbidity.

Typically, the hospital and surgeons dictate the date of the patient's clinic appointments, reassessment and operation. One theory accounting for high 'did not attend' rates is that patients have no control over the dates of their appointments or their operation, which may clash with work or family commitments. The 'WIWO' hernia clinic has sought to address this problem by putting the patient in charge and providing them with the autonomy to choose the date of their consultation and operation. This has allowed us to reduce the 'did not attend' and cancellation rates from nearly 15% to around 3%, in just 6 months. It is hoped that this figure will reduce even further as more doctors and patients are educated about this clinic.

The 'WIWO' hernia clinic has especially helped high risk elderly patients and those with associated co-morbidities. These are the patients who would otherwise be on in-patient waiting lists, have protracted hospital stays, sustain nosocomial infections and who run the risk of being repeatedly cancelled on the day of surgery. These patients have had successful inguinal hernia repair under local anaesthetic in the 'WIWO' hernia clinic, which is unrestricted in terms of patients' ASA status.

Patients are no longer burdened with making arrangements for three visits to the hospital and can be treated on an entirely

one stop basis, with a reduced waiting time from initial GP consultation to the date of surgery. As a consequence, high risk elderly patients are no longer forced to seek treatment in the private sector.

Inguinal herniorrhaphy under local anaesthetic has been shown to be beneficial with patients experiencing less postoperative pain, earlier ambulation and less frequent micturition problems [3–5].

Our patient 'satisfaction survey' reflects the advantages that the patients experience with this treatment. Nearly 97% ($n = 69$) of the patients, who have been treated and returned their proformas, reported that they were either very satisfied or satisfied with their treatment.

Indeed, 95% of the patients stated that they would recommend the service to their friends and relatives and would have a hernia on the contralateral side repaired in the same way if it were to become necessary in the future.

Only two patients were not totally satisfied. One of these patients confessed to being needle phobic and only came to the WIWO clinic in order to be able to choose the date of his operation. The other patient felt that the needles used for infiltration of local anaesthetic were too blunt. However he did not have any specific complaint or suggestions regarding the clinic or the service provided.

The benefits to the hospital include, reduced clerical work and its associated costs (as all patients ring to make their appointment and the hospital does not send any information in the post). On average a hospital loses approximately £1000 per patient if they do not attend the outpatient appointment, the date of pre-assessment and/or the day of operation. By reducing the number of appointments, 'did not attend' and cancellation rates we estimate a significant financial saving for the Trust. Since all our patients have inguinal hernia repair under a local anaesthetic we have saved on the costs and manpower associated with routine preoperative tests and have released our consultant anaesthetists for sessions elsewhere. As the patients choose and arrange their own appointment, we have been able to dispense with the waiting lists for inguinal herniorrhaphy, except where the patients choose not to follow this route.

The consultant has found this clinic to be an ideal place to teach medical students how to examine inguinal hernias and to define the anatomical boundaries of the inguinal canal. Surgical trainees gain an opportunity to learn the technique of herniorrhaphy under local anaesthetic.

A recent study by Putnis et al. [6] has demonstrated similar success with one-stop inguinal hernia surgery. Since the vast majority of their patients had a general anaesthetic (only two patients had hernia repair under local anaesthetic), a pre-assessment health questionnaire was still required and they were limited to ASA class I and II patients. This excludes the significant number of patients (ASA III and IV) who would otherwise be on an in-patient waiting list or be repeatedly declined surgery due to their co-morbidity, bed shortage and theatre time. Of the 12 patients who were deemed unsuitable for day surgery by Putnis et al., 11 could have had successful

Table 3
Benefits of WIWO clinic

Summary of benefits of the 'WIWO' hernia clinic
Patients have a choice of an operation under local anaesthetic
One single visit for consultation and operation
A date of their choosing to fit in with their work and private life
No cancellations due to bed shortage or ASA status
Recovery from operation in the comfort of their home with their loved ones
Minimizing risk of nosocomial infection
Reduced waiting times from initial GP consultation to the date of surgery

open hernia repair under local anaesthetic in our 'WIWO' hernia clinic.

In addition, the patient's were required to visit their GP on two separate occasions, once to confirm the diagnosis and then for a general examination and completion of a health questionnaire. We believe this extra load on the already crowded GP surgery makes it harder to optimize their surgery time. It raises the question as to whether or not such a system is truly one-stop because the burden of visits is being transferred from the hospital to the GPs. In contrast, the 'WIWO' hernia clinic has led to a reduced volume of correspondence with the hospital and less repeated referrals of high-risk patients allowing GPs to maximize their surgery time.

We feel it is the GPs who know their patients best. Their input and co-operation is crucial to receiving appropriate referrals and allaying the apprehension of patients regarding surgery.

We have shown that the use of a detailed protocol sent to all referring GPs is not only a useful tool in receiving appropriate referrals, but extremely important in the successful running of this clinic.

Even patients who were referred inappropriately were seen by the consultant surgeon, had their routine pre-assessment for a general anaesthetic and were given a date for laparoscopic repair (total extraperitoneal procedure) at this visit. This has prevented them from making any further visits to the hospital except for their operation.

It is important to stress that no patient is under duress to undergo treatment on the day of the visit. For successful treatment of inguinal hernia under local anaesthetic it is imperative that the patient is willing and moreover wishes to have the operation performed this way.

Indeed, to avoid this clinic becoming a 'conveyor belt' those patients who prefer to have a general anesthetic or feel they need more time to think, are given an out patient appoint-

ment for further discussion or are offered a place on the in patient waiting list for an inguinal hernia repair under a general anaesthetic. We have not encountered any such patient thus far.

The benefits of the 'WIWO' hernia clinic described above are summarized in Table 3.

5. Conclusion

To reduce 'did not attend' and cancellation rates in our out-patient clinics, pre-assessment clinics and operating theatres and to maximize the use of our limited beds, we need to put the patients at the centre of our care and make them control some aspects of their treatment, such as choosing the date of their operation. This 'WIWO' clinic has shown that for operations such as inguinal hernia repair, it is feasible, very acceptable, safe and makes financial sense.

Acknowledgements

This paper is dedicated to the memory of Dr. Giordano Abbondati, consultant anaesthetist at the ACAD unit, Central Middlesex Hospital, London. We are grateful to Miss Aleka Bhutiani, for suggesting the name 'WIWO' hernia clinic. We extend our thanks to Miss Sophie Renton, Nicky Bloom, Sister Rose and her team of nurses for their dedication and hard work.

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Nursing knowledge and the expansion of day surgery in the United Kingdom

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Received 5 July 2005; accepted 19 September 2005

Available online 11 November 2005

Abstract

Background: The amount of surgery undertaken within United Kingdom Day Surgery Units has risen considerably over the past 15–20 years. Throughout this pioneering era, nursing roles and responsibilities within the modern surgical environment have developed although have largely shadowed medical advances. Evidence based nursing knowledge appears to have contributed very little to the recent success of day surgery. This may be due, in part, to the lack of attention given to modern surgical practices within current pre-registration nurse education programmes of study.

Aim: The aim of this educational audit was to evaluate the consideration given to modern surgical practices in the programmes of study of recently qualified staff nurses employed within Day Surgery Units in the United Kingdom in order to gauge the extent of the challenge.

Method: A postal audit was designed and sent to $n = 247$ Day Surgery Units. The audit was intended to elicit information from the staff nurses regarding their experiences of modern, elective day surgery during their nurse education programmes of study.

Results: Two hundred and seventy seven staff nurses responded revealing that the level of attention to day surgery practices within pre-registration programmes was extremely low. The professions' actual and potential theoretical contribution to modern surgical practices was virtually nil. Their experience of pre-operative nursing intervention appeared mainly to involve the teaching of traditional surgical in-patients nursing skills. The inclusion of modern surgical practices into the theoretical assignments within the programmes of study was very limited. Once qualified, the vast majority of staff nurses experienced no additional formal education for their new role.

Conclusions: The results are discussed in relation to the re-focusing of pre-registration nurse education, changing clinical roles and the future of nursing within the modern surgical arena.

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Keywords: Ambulatory surgery; Nurse education; Clinical research; Nursing roles

1. Day surgery: a new era of surgical nursing intervention

The amount of day surgery being undertaken in the United Kingdom has risen considerably over the past two decades [1]. Currently, the government is seeking to increase the average level of day surgery activity still further from 60–65 to 75% of all elective surgery [2,3]. Three central strategies to aid expansion are currently being pursued (i) encouragement to increase current capacity, (ii) building of new treatment centres (formally diagnostic and treatment centres) and (iii)

the introduction of National Tariffs. Firstly, wide differences in day surgery activity exist throughout the United Kingdom. If all the Day Surgery Units were as efficient as the best performers 120,000 more day-case procedures could be undertaken in day surgery facilities [4]. Efforts are therefore being made to help encourage Day Surgery Units to enhance their potential [5,6]. Secondly, the United Kingdom government is currently in the process of commissioning the building of new treatment centres both within the N.H.S. and the independent sector [7,8]. Treatment centres are new dedicated Day Surgery Units, generally built away from the acute hospital services. Approximately, 60–80 treatment centres are planned for England by the end of 2005 and a further 100 by 2006 [9]. Thirdly, alongside such expansion, National

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Tariffs or ‘Payment by Results’ for surgery undertaken is being planned. “It will mean that N.H.S. organisations are paid more fairly for the treatment they provide. Money will be linked directly to patients and patient choice so the more productive and efficient an N.H.S. Trust, the more it will benefit from extra resources” ([6] p. 61). The more efficient N.H.S. Trusts who undertake more day surgery will thereby be more financially rewarded. National Tariffs will be phased in over the next few years and be fully operational by 2008. “In particular, the Department (DoH), with the N.H.S., will look to develop incentives that help to reduce unnecessary hospitalisation” ([8] p. 69).

This rapid change in surgical healthcare delivery has ensured a major shift of emphasis in surgical nursing intervention [10]. Intermediate, elective surgical episodes once requiring lengthy hospital admission are fast disappearing from the in-patient ward, never to return, e.g. inguinal hernia repair, varicose vein stripping, cataract extraction, cholecystectomy and many more [11]. (Intermediate, elective surgery is defined here as planned uncomplicated surgery under general anaesthesia, which can be undertaken in an operating theatre in less than 1 h). Six years ago the British Association of Day Surgery recommended that at least 50% of all cholecystectomy surgery should be possible in day-case facilities [11]. The extensive physical pre- and post-operative nursing interventions once required by patients undergoing cholecystectomy are now becoming obsolete. This progress will inexorably lead over the next decade to the ever greater transfer of in-patient surgical procedures to day surgery facilities, e.g. hip replacement, prostatectomy and haemorrhoidectomy [12–14] and a constant decrease in the need for a considerable amount of physical surgical nursing intervention. Together with cost savings to be made from greater efficiency [15], National Tariff incentives and patients as willing accomplices to this surgical revolution [16,17] the further expansion of day surgery is inevitable.

In order to accommodate such a shift in surgical healthcare delivery the majority of nurses currently employed in Day Surgery Units within the United Kingdom undertake a multi-skilled role [18–21]. The adoption of numerous quasi-medical tasks by the profession is vital to ensure the safe and efficient throughput of patients in the limited time available. Much of this work is dominated by medical protocols in order to guarantee medical fitness for surgery [22–26]. Although such tasks are vital, an unfortunate consequence of such a rapidly changing medical agenda is that evidence based ‘nursing knowledge’ has contributed very little to the success of day surgery [27]. However, nursing knowledge may have a considerable part to play in the future as many challenging issues, which have the potential to be influenced by the application of nursing knowledge remain, e.g. pain management [28–32], psycho-educational intervention [33–37], nurse-led pre-assessment [38,39] and post-operative care [40,41].

The lack of awareness of the potentially valuable contribution nursing can afford day surgery practices may be due, in part, to the lack of attention given to modern surgi-

cal practices within current pre-registration nurse education programmes of study (modern surgical practices are defined here as the care and treatment provided to patients who spend 24 h or less in hospital surgical facility). Much consideration is given to traditional in-patient care within current pre-registration nurse education programmes of study although, as highlighted, such intervention now forms a far smaller element of the surgical nurses’ clinical role. If nurse educators, in collaboration with clinical colleagues, do not expose students new to the nursing profession to the potential contribution nursing knowledge can offer this new surgical era, from where is the evidence for effective surgical nursing fit for the 21st century to arise? If the current trend continues the profession is destined merely to follow in the wake of day surgical advances, accumulating devolved medical tasks and re-labelling them as surgical nursing intervention with little or no discrimination in-between. The current United Kingdom government desires a large number of student nurses to be educated to help achieve their N.H.S. reforms [5,42]. Some of these longstanding reforms do not have the promotion of nursing knowledge as a central feature. For example, between 4000 and 5000 nurses, physiotherapists and operating department assistants will be appointed over the next decade, depending upon demand, as surgical assistants [43]. It could be argued that we are currently engaged in educating additional nurses today for many of them to be undertaking doctor’s roles tomorrow.

In light of such expansion, an accurate evaluation of the position of nurse education in the United Kingdom in relation to the exposure of student nurses to modern surgical practices is required as a baseline from which to approach the challenge. The aim of this educational audit was therefore to evaluate the consideration given to modern surgical practices in the programmes of study of recently qualified staff nurses currently employed within the day surgery clinical environment, i.e. nurses who have qualified within the last 5 years (1999–Autumn 2004). The rationale being that new surgical nursing knowledge will not emerge while modern, surgical practices remain largely absent from programmes of study. The above specific time frame was chosen as it encompassed the period in which the ‘Making a Difference’ document was launched and implemented [44]. This document was designed to complement the N.H.S. strategy for the future [2].

2. Methodology

2.1. Literature review

In order to facilitate the study a literature search was undertaken employing the following nursing databases—RCN, Kings Fund, British Nursing Index and Cumulative Index of Nursing and Allied Health Literature (CINAHL). The following keywords were used with each database—day surgery and nurse education, surgery and nurse education, peri-operative care and nurse education, pre-operative care

and nurse education, post-operative care and nurse education and surgery and nursing curriculum.

Very little literature was uncovered. It would appear that aside from overarching reports such as Project 2000, Fitness for Practice and Making a Difference' [44–46] little or no specific clinical research has been undertaken to inform nursing curricula of the necessary modern surgical nursing skills and knowledge pertinent for the 21st century. Indeed, it has been argued that much of the rationale regarding the implementation of the initial Project 2000 programme was not sufficiently evidence based [47]. The implementation of Project 2000 originated from two main sources both of whom argued, alongside other issues, for the abolition of nurses as apprentices and a move towards a more 'knowledgeable doer' [45,48]. Although both are very laudable issues, there appears to have been a distinct lack of research evidence from the outset concerning, modern clinical practices. The Making a Difference document was designed to succeed the reforms of Project 2000 [46] and generate a modern, nursing curriculum intended to help deliver the N.H.S. Plan of healthcare reform [2]. Within the Making a Difference document there is only one very brief mention given to modern surgery within the context of surgical nursing and meagre overall reference to nursing research per se [49].

No nursing research was uncovered to help inform the pre-registration nurse education programmes of study but a number of studies have highlighted post-qualifying nursing roles within modern surgery, i.e. extended roles and nursing within pre-assessment clinics. Firstly, extended nursing roles in modern surgery are developing in anaesthesia [50–52], laparoscopy [53] and surgery [54,55]. The development and extension of nursing roles is a central theme in the N.H.S. Plan [2,5,56] as nurses are viewed as a flexible workforce who can undertake additional medical skills. Secondly, the pre-assessment of patients is a vital pre-requisite for successful, safe day surgery [57–59]. Courses are being designed for nurses to learn the skills required in the pre-assessment clinics and thereby help to improve day surgery efficiency [60]. However, extended roles and the gaining of pre-assessment skills both embrace devolved medical tasks [23,26,38,61–65]. Unfortunately, the exposition of nursing knowledge is again not considered although some studies have demonstrated the value of nursing skills in the pre-assessment clinic [39,66]. Largely, it is the interpersonal skills of the nurse that have contributed to the patients' positive experiences [67]. Nevertheless, interpersonal skills, the provision of information and psychological aspects of care remain peripheral issues delivered on an ad hoc basis and marginalised by other essential medical tasks.

2.2. Materials and participants

An audit form was constructed to gain an overview of the exposure to day-case surgical practices within the respondents pre-registration nurse education programmes of study. The items were brief and straightforward with the focus

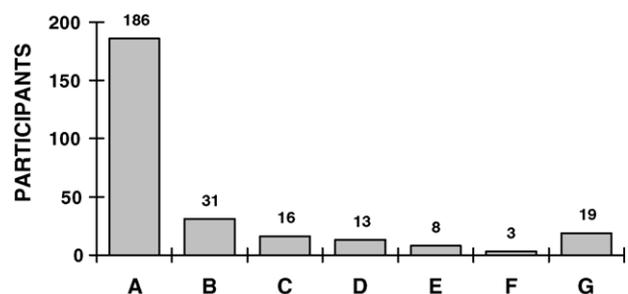
upon the amount of attention given to modern, day surgery practices within their recent programmes of study, i.e. theoretical content, assignments, type of surgical intervention taught, clinical placements in day surgery, post-qualifying studies and country of pre-registration study. The audit did not discriminate between diploma and degree pre-registration education. Items were designed with the flexibility to gain all responses. For example, "Approximately, how many hours were spent while in the School of Nursing during your pre-registration education specifically studying day surgery practices? (Answer) 1, 2, 3, 4, 5, 6 or more hours." The audit form was purposely kept brief and uncomplicated to aid the response rate.

The educational audit form was sent to Day Surgery Units ($n = 247$) within the United Kingdom utilising the addresses freely available via public access media. Day surgery managers were invited to question the staff nurses employed within their Day Surgery Units, respond to the audit and return it in the pre-paid envelope provided. Only staff nurses who had qualified since 1999 and Autumn 2004 were invited to complete the audit, as previously explained, this is the period in which the 'Making a Difference' document was implemented.

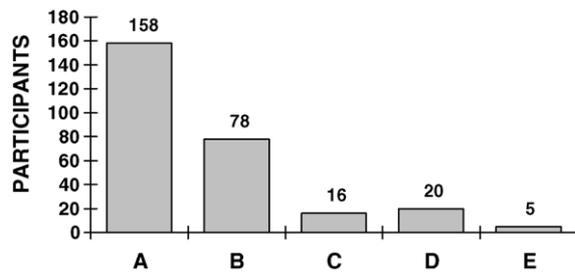
3. Results

A response rate of 42% was achieved. As there were frequently several staff nurses employed within individual Day Surgery Units who met the criteria, the final number of respondents was $n = 277$. A total of 58% ($n = 158$) respondents did not have the experience of a day surgery placement during their nurse education programme whereas 43% ($n = 119$) did have the benefit of a placement.

Sixty-seven percent ($n = 186$) experienced no theoretical input into modern day surgery nursing practices at any time throughout their 3 year programmes (Graph 1). Respondents were also invited to specify, which phrase best described the post-operative care taught throughout their programmes of study. The choices ranged from 'Traditional in-patients post-operative care' through to 'Day surgery post-operative care' (Graph 2). The majority (57% or $n = 158$) indicated



Graph 1. Theoretical input into day surgery practices during pre-registration nurse education. (A) None, (B) 1 h, (C) 2 h, (D) 3 h, (E) 4 h, (F) 5 h and (G) 6 h or more hours.

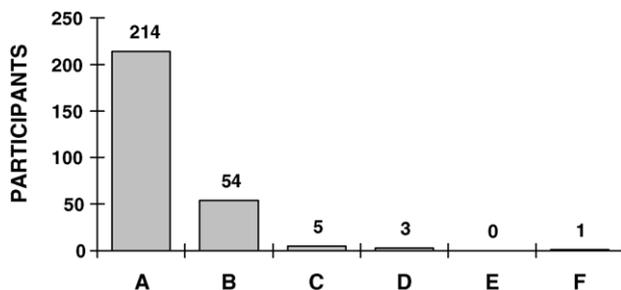


Graph 2. Post-operative nursing intervention taught during pre-registration nurse education. (A) Traditional in-patient post-operative intervention, (B) in and out-patient post-operative intervention, (C) traditional in-patient and day surgery patient post-operative intervention, (D) traditional in-patient, out-patient and day surgery post-operative intervention and (E) day surgery post-operative intervention.

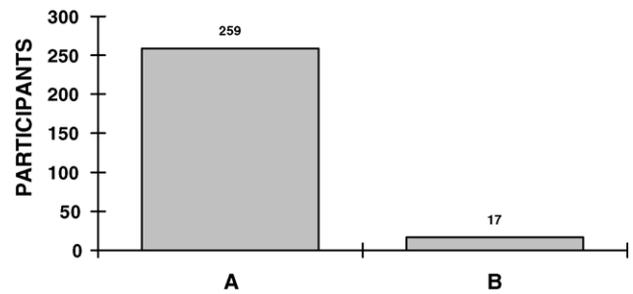
they had received ‘Traditional in-patient care’ only. The second largest group at 28% ($n = 78$) was ‘In-patient and out-patient post-operative care’ (Graph 2). Therefore, 85% ($n = 236$) of all post-operative nursing intervention taught to this group of staff nurses, currently employed within the day surgery environment, concerned in-patient and out-patient post-operative care only. Consequently, 85% of respondents received no instruction on post-operative day surgery nursing intervention.

Respondents were also asked to indicate the number of theoretical assignments presented throughout their 3 year programme of study that had encompassed modern day surgery practices. Seventy-seven percent ($n = 214$) indicated they had undertaken no theoretical assignments relating to day-case surgery followed by 20% ($n = 54$) who had undertaken only one such assignment. This indicates that 97% ($n = 268$) of staff nurses currently employed within the day surgery clinical environment, who responded to this educational audit, had undertaken no theoretical assignments (or a minimal number) relating to nursing practices in modern day surgery (Graph 3). Of note is the one staff nurse who had experienced six theoretical assignments during his/her programme of study. However, this nurse had undertaken his/her programme of study outside the European Union.

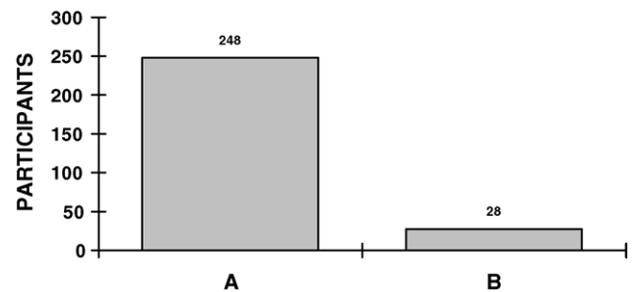
The vast majority of respondents (94% or $n = 260$) had undertaken their nurse education within the United Kingdom



Graph 3. Day surgery theoretical assignments undertaken during pre-registration nurse education. (A) None, (B) one theoretical assignment, (C) two theoretical assignments, (D) three theoretical assignments, (E) four or five theoretical assignments and (F) six or more theoretical assignments.



Graph 4. Country where pre-registration nurse education programme undertaken. (A) United Kingdom and (B) outside European Union.



Graph 5. Formal post-qualifying day-case surgery education. (A) None and (B) some (specific to day surgery).

with $n = 17$ staff nurses undertaking it outside the European Union (Graph 4). Finally, the respondents were requested to indicate what formal programmes of education, specifically relating to day surgery practices, they had undertaken since becoming a qualified nurse and practicing within the day surgery environment. Ninety percent ($n = 248$) had undertaken no formal post-qualifying programme of study relating specifically to day surgery practices (Graph 5).

4. Discussion

The aim of this audit was to evaluate the consideration given to modern surgical practices in the programmes of study of recently qualified staff nurses currently employed within the day surgery clinical environment. The results reveal a less than ideal representation of current pre-registration nurse education programmes of study in the United Kingdom in relation to the preparation of nurses for the modern, day surgery environment. The issues these results raise will be considered under the following subheadings of nurse education, clinical nursing roles and the future of surgical nursing within modern, elective surgery.

4.1. Nurse education

Pre-registration diploma and degree programmes of study clearly cannot include all aspects of nursing, as the length of such programmes would be prohibitive. Surgical nursing is changing and will never return to previous ways. Programmes of study, which primarily focus upon traditional surgical

nursing intervention, are now obsolete. Traditional surgical nursing intervention is defined here as (i) pre-operatively—a patient admitted in advance of the day of surgery and requiring much physical, social and psychological aspects of care and (ii) post-operatively—a patient who remains in hospital for more than 24 h requiring much physical, social and psychological aspects of care. As stated previously, this type of patient is now in the minority as the current United Kingdom government plans for 75% of all adult, elective surgery to be transferred to day surgery facilities [2]. Current 3 year programmes of study in which two-thirds of nurses are not receiving any theoretical insight into the nursing challenges confronting day surgery may be considered by many as unacceptable.

On a more positive note, 43% of the staff nurses experienced a day surgery placement during their programme of study. With 85% experiencing no day surgery post-operative management, 79% virtually no theory and 77% no specific assignments, is 43% gaining a placement truly concerned with day surgery enhancement or merely a convenient clinical placement within a very congested clinical placement programme (Graph 6). The staff nurses who responded to this educational audit were manifestly not prepared for their new roles in modern surgery—clinically or theoretically. It is recognised that nursing is diverse and many surgical patients will still require the traditional surgical nursing skills, highlighted above. However, programmes of study must remain clinically updated and gain greater flexibility in order to avoid the issues raised here. The development of modern day surgery and the potential contribution the nursing profession can offer must become an integral part of all pre-registration nurse education programmes. Based on the results of this educational audit, the priorities within surgical nurse education programmes must be completely reversed. The majority of pre- and post-operative nurse education should now be concerned with modern surgical practices and patients who experience 24 h or less in hospital. The minority of pre- and post-operative nurse education should be concerned with in-patient surgical practices and patients who experience 48 h or more in hospital. Theoretical assignments throughout all pro-

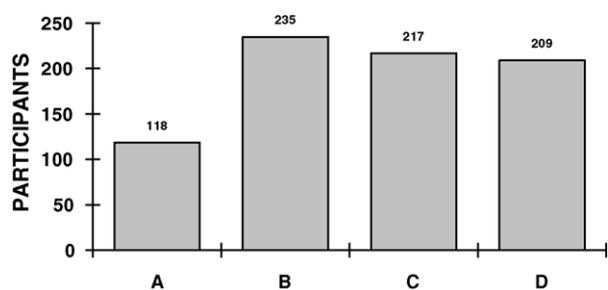
grammes of study must also reflect this changing emphasis. A greater emphasis must be placed upon the generation and utilisation of clinical research into modern, surgical nursing practices to prevent the profession falling even further behind in this day surgery revolution.

4.2. Clinical nursing roles

Only 43% of the staff nurses who responded to this educational audit experienced a clinical placement within day surgery during their 3 year programme of study. Many transferable skills will certainly have been acquired during other clinical placements although numerous aspects within modern surgery are unique because of the limited time available on the day of surgery, i.e. rapid recovery from anaesthesia [68–70], post-operative pain management [31] and early discharge following surgery [68,71–74]. Undoubtedly, extensive clinical supervision and clinical mentorship will have also occurred during the period since qualification. Programmes of a more formal nature are undeniably lacking, as 90% of respondents had undertaken no post-qualifying course in day surgery. Many respondents commented that this was not due to a lack of motivation but a shortage of finances and the limited number of courses available. In a comprehensive report undertaken to evaluate day surgery services [75] it was stated that insufficient funds were available for post-qualifying day surgery nursing studies and more should be made accessible. Since the publication of the report, such financial resources have evidently not emerged. Such limited resources available for post-qualifying nursing staff only seeks to reaffirm the crucial importance of pro-active and clinically dynamic pre-registration programmes of study.

Almost 80% of staff nurses experienced very little or no theoretical input into modern, day surgery nursing practices, e.g. extended roles, multi-skilling, pre-assessment, pain management. Likewise, little or no relevant political healthcare issues with the potential to impact greatly upon future surgical nursing intervention could have been conveyed, e.g. expansion of Treatment Centres, National Tariffs. With no theoretical insight into modern surgical practice, no overview of the changing political agenda and almost no post-qualifying education it is completely understandable why evidence based ‘nursing knowledge’ has currently contributed very little to the success of day surgery. Many recently qualified nurses have clearly not been exposed to such issues. Prior to the acceptance of nursing students to any Day Surgery Unit in the United Kingdom it may be of great benefit if the clinical staff enquire about the theoretical component within the student’s curriculum in relation to modern surgical practices. Additionally, this enquiry should extend to the number of theoretical assignments associated with modern surgery.

It has been recommended that nurse education should become more flexible and consider developing more distance learning packages, especially for post-qualifying courses [76,77] or more web-based learning approaches [78]. Such



Graph 6. Day surgery clinical placement in comparison with theoretical exposure. (A) Number of students experiencing a day surgery placement. (B) Number of students experiencing NO theoretical post-operative management in modern surgery. (C) Number of students experiencing little or NO theoretical issues relating to modern surgery. (D) Number of students experiencing NO assignments relating to modern surgery.

programmes have indeed started to emerge although not without their problems [79]. Innovative distance learning programmes in modern day surgery have also been commenced in response to the issues raised above [59]. A central feature of day surgery is the utilisation of pre-assessment clinics where nurses require a number of additional skills, e.g. interpretation of electro-cardiographs (ECG), purpose and calculation of body mass index (BMI), purpose and calculation of the American Society of Anesthesiologists (ASA) scoring system, unique patient information requirements, etc. The Modernisation Agency produced a high-quality learning resource containing extensive information plus a compact disc for tuition purposes [59]. This distance learning resource has (i) evidently not yet reached the day surgery staff within this educational audit and (ii) is only concerned with exposure to the largely medically orientated tasks of pre-assessment. Although nurses require such instruction for this role, such initiatives again do little to champion nursing knowledge and enable the profession to deliver a valued and lasting contribution to modern, surgical nursing practices well into the 21st century.

4.3. Future of nursing within the modern surgical environment

The current United Kingdom government plans to reduce the waiting time for in-patient surgery to 6 months by December 2005 and remove all waiting time completely by 2008 [8,80]. In an effort to achieve this target, dedicated day surgery facilities are being expanded and new treatment centres built [7]. The additional treatment centres planned for the end of 2005 will treating an extra 250,000 patients per year [80]. While nurses employed within treatment centres will predominantly remain in the familiar multi-skilled day surgery role, future employment may be based on a competency rating scale, i.e. ability to perform such tasks as venipuncture, cannulation, electro-cardiograph (ECG) reading, etc. [9]. Additionally, other ways in which nurses can be employed are being explored, as stated above [9,43,81]. It is suggested that nurses should welcome such change as new opportunities will become available, i.e. convenient working hours, scope for extended roles, improved continuity of patient care, new well-equipped clinical environments and the possible introduction of new 'school term' contracts [9,82]. All such developments intrinsically signify the continued adoption of quasi-medical tasks with, again, seemingly little or no input from nursing knowledge regarding the most effective nursing intervention for the modern surgical patient.

From the evidence gained in the present study, two main challenges will arise when modern treatment centres become more widespread and nurses are increasingly delivering care in the manner described [8]. Firstly, how will nurses be educated to undertake the extended roles suggested, i.e. anaesthetic care, electro-cardiograph reading, venipuncture and cannulation? This educational audit indicates that inadequate education currently exists for day

surgery within pre- and post-qualifying programmes prior to further expansion. The distance learning programmes presently offered appear so far to have made little impact. Secondly, considerable evidence suggests that pain management following day surgery [28–32,83], pre- and post-operative psycho-educational intervention [33–37,84], nurse-led pre-assessment clinics [38,39,85] and post-operative primary care [40,41,86] remain challenging issues in need of improvement. Exposure to day surgery practices was extremely limited in pre-registration programmes and 90% of staff nurses had undertaken no formal education in day surgery since qualification. Such challenges to the patients' experiences of day surgery will inevitably remain or even increase with this planned expansion if nurses are predestined always to undertake such quasi-medical duties and nursing knowledge, with the potential to contribute to modern surgical practices, is overlooked.

5. Conclusion

Staff nurses who qualified during the period between 1999 and Autumn 2004 were invited to respond to an educational audit concerning their exposure to modern surgical practices during their 3 year pre-registration programmes of study. Very little evidence of dynamic, clinically realistic programmes of study, which equipped the nurses for practice in the modern surgical environment, emerged. The nursing profession should, as a priority (i) reverse the emphasis placed upon surgical nursing intervention within all programmes of study and (ii) undertake clinical research to determine the evolving skills required by nurses in the modern surgical environment. New knowledge regarding the evolving role of the nurse in modern, elective day surgery is required directly. The trend to accumulate devolved medical tasks and re-label them as surgical nursing intervention cannot continue to go unchallenged, as many pressing issues within the nursing domain exist. The profession should also petition for increased post-qualifying resources that examine nursing issues in modern surgery rather than constantly extolling the virtues of extended roles. With the inevitable expansion of day surgery, extended roles are gaining greater prominence to the potential detriment of other highly valuable nursing issues.

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Oral or rectal diclofenac for laparoscopic sterilization[☆]

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Received 4 March 2005; accepted 21 October 2005

Available online 5 December 2005

Abstract

In the UK, perioperative non-steroidal anti-inflammatory drugs are commonly administered via the rectal route even though suppositories are unpopular with patients. This prospective, randomised, double-blind study compares the analgesic effectiveness of diclofenac 100 mg given either orally or rectally to 42 ASA grades 1 and 2 patients scheduled to undergo day-case laparoscopic sterilization by the application of Filshie clips. General anaesthesia was induced with fentanyl $2 \mu\text{g kg}^{-1}$ and propofol and maintained with isoflurane and nitrous oxide in oxygen. No difference was observed between the two groups in postoperative pain scores, morphine requirement, nausea and vomiting rates and time to achievement of street fitness. One patient in the rectal group and none in the oral group required in-patient admission. We conclude that oral and rectal diclofenac are of equal effectiveness in this approach to day-case laparoscopic sterilization.

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Keywords: Postoperative analgesia; Analgesics; Diclofenac; Surgery; Gynaecological laparoscopy

1. Introduction

In the UK, laparoscopic sterilization is commonly performed as an outpatient procedure. Postoperative pain may be severe and difficult to manage [1]. The efficacy of analgesic methods such as applying local anaesthetic gel to the Filshie clips [2], intravenous glycopyrrolate [3] and rectal diclofenac [4] has been demonstrated.

In other published studies investigating its efficacy, diclofenac has been administered intramuscularly [1] and intravenously [5] following the induction of anaesthesia. Neither has been shown to be superior to placebo. Suppositories are unpopular with patients [6], and their use without consent has been the subject of a serious professional misconduct ruling by the General Medical Council (GMC) [7]. The oral route avoids this problem but there has been no previous examination of its effectiveness in the perioperative

setting. This study was designed to compare the analgesic and morphine-sparing properties of oral diclofenac premedication with the administration of suppositories after induction of general anaesthesia—the current practice in our day case unit.

2. Method

After approval by the local ethics committee, written informed consent was obtained from 42 female outpatients (ASA I or II) aged 25–45 years scheduled for laparoscopic sterilization. Exclusion criteria included allergy to non-steroidal anti-inflammatory drugs (NSAIDs), asthma, renal impairment, history of peptic ulceration, bleeding disorder, and prior regular analgesia. Patients were allocated to either group O (oral dosing) or group R (rectal dosing) by computer generated random number tables. All patients and the investigators were blind to the treatment allocations. Group O patients received oral diclofenac 100 mg modified release (Diclovol[®] Retard, Arun Pharmaceuticals Ltd, UK) 75 min preoperatively and a placebo suppository immediately after

[☆] Presented as a oral presentation at the Group of Anaesthetists in Training Annual Scientific Meeting, Bristol, 2003 and as a poster at the WCA 2004 Meeting, Paris.

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induction of anaesthesia. Group R patients received an oral placebo preoperatively and diclofenac 100 mg (Voltarol[®], Novartis Pharmaceuticals, UK) rectally immediately after induction of anaesthesia. Placebos were manufactured by the St Thomas' Hospital Pharmacy and supplied with the corresponding active preparation in numbered sealed packs.

All patients received a standardised anaesthetic. No other premedication was given. Anaesthesia was induced with fentanyl 2 µg kg⁻¹ and propofol 2–4 mg kg⁻¹ followed by cyclizine 50 mg. A laryngeal mask airway was inserted and the lungs were ventilated via a circle system. Anaesthesia was maintained with nitrous oxide 70% and isoflurane 1–2% in oxygen. When required, neuromuscular blockade was facilitated with mivacurium 5–10 mg. Atropine, glycopyrrolate and neostigmine were avoided in all cases.

Surgery was carried out via a 5 mm laparoscope using Filshie clips. To standardise the procedure as much as possible, 38 operations were performed by the same Consultant Gynaecologist, 4 by Specialist Registrars under his direct supervision. No definable anaesthetic or surgical complications occurred. No additional surgical procedures were required by any patient. Incision sites were infiltrated with 10 ml of bupivacaine 0.5%.

Postoperatively, patients were prescribed morphine intravenously in 2 mg aliquots for severe pain, dihydrocodeine 60 mg for moderate pain, and paracetamol 1000 mg for mild pain, to be given as and when the nursing staff considered it necessary. Ondansetron 4 mg was used for rescue anti-emesis.

Patients were asked to score their pain on a 100 mm visual analogue scale (VAS, 0: no pain; 100: worst pain imaginable) on waking, 1 h postoperatively, 2 h postoperatively and on discharge. A further VAS at 24 h was returned via a questionnaire.

A power calculation, based on the standard deviation from a previous study [2], suggested that 20 patients per group would be required to detect a 20 mm difference in pain scores

Table 1

Demographic data values are median (range), mean (S.D.) or number where appropriate

	Group O (n = 21)	Group R (n = 21)
Age (year)	36 (3.4)	34 (5.5)
Weight (kg)	66 (10.3)	65 (13.8)
ASA grade		
1 (n)	20	21
2 (n)	1	0
Duration of surgery (min)	15 (6–33)	11 (6–20)

($\alpha = 0.05$, $\beta = 0.8$). Data were analysed using Student's *t*-test for the patient's age and weight, the χ^2 -test for categorical data and the Mann-Whitney *U* test for ordinal data. Statistical tests were performed using Microsoft[™] Excel and Microsoft[™] SPSS.

3. Results

All 42 of the patients in this study gave informed consent, 21 in each group. Both groups were of similar age, weight, ASA score and duration of surgery (Table 1). One patient required subsequent in-patient admission as a result of inadequate pain management. Twenty-eight patients (66%) returned their 24 h questionnaire (Tables 2 and 3).

There were no statistically significant differences in post-operative pain scores, morphine dose, nausea and vomiting, time to discharge, and in-patient admission rates (Tables 2 and 3).

4. Discussion

In this study we were unable to demonstrate any difference in analgesic effects between patients premedicated with oral

Table 2

Pain scores are median (range)

Time	Group O (n = 21)	Group R (n = 21)	<i>p</i>	95% confidence interval
Waking	25 (1–97)	37 (0–100)	0.92	–17 to +19
1 h postoperatively	28 (3–74)	26 (0–100)	0.64	–16 to +16
2 h postoperatively	10 (0–73)	11 (0–68)	0.94	–10 to +6
Discharge	4 (0–31)	5 (0–56)	0.61	–5 to +3
Time	Group O (n = 16)	Group R (n = 12)	<i>p</i>	95% confidence interval
24 h postoperatively	4 (0–42)	5 (0–24)	0.76	–4 to +6

Table 3

Postoperative outcome values are median (range) or number (proportion) where appropriate

	Group O (n = 21)	Group R (n = 21)	<i>p</i>	95% confidence interval
Morphine dose (mg)	4 (0–15)	0 (0–26)	0.09	0–4
Time to discharge after surgery (min)	161 (120–232)	142 (120–219)	0.06	0–34
Nausea	9 (43%)	7 (33%)	0.53	
Vomiting	2 (10%)	1 (5%)	0.55	
In-patient admission	0	1 (5%)	0.31	

diclofenac and those given rectal diclofenac after induction of anaesthesia. The in-patient admission rate was acceptable. Pain scores were similar and low for both groups at all stages. The power calculation was based on the standard deviation of the control group pain scores from Ezeh's study [2]. There are few standard deviations reported in the literature. The anaesthetic technique was similar to that used in our study, although the dose of fentanyl was lower at $1 \mu\text{g kg}^{-1}$. This accounts for the lower pain scores reported by our patients, making it less likely that a statistically significant difference would occur. Notwithstanding, 20% of our patients reported pain scores greater than 50 mm and 65% required rescue opioid analgesia.

The 66% response rate for the 24 h pain score was disappointing. This may be due to the high level of domestic commitments of the study group. In retrospect, telephoning the patients may have produced a greater response. However, this problem arose after a substantial proportion of the patients had been recruited, and to rectify it would have required a change of study design.

The relative efficacy of drugs given via different routes can be evaluated only after considering the dose, the timing of administration, the duration of anaesthesia and any other analgesic use. At equal doses, a higher peak plasma diclofenac concentration is achieved by the oral, compared to the rectal, route [8,9]. The same dose was given to both groups because both tablets and suppositories are readily available as 100 mg preparations. No data was available to guide an alteration of the oral dose to produce an identical peak plasma concentration in the two groups. It has been demonstrated that after oral and rectal administration of the drug, peak plasma diclofenac concentrations are attained at 2 and 1 h, respectively, in healthy volunteers. The drug regimen used in this study, based on known pharmacokinetic data, was designed to achieve peak plasma levels of diclofenac during the first postoperative hour. Given the short duration of surgery, neither group would have achieved peak plasma levels on waking. It is likely that the residual effect of fentanyl, given at induction, would have accounted for most of the analgesic effect at this time. After 1 h, pain scores were similar. Many patients had, by then, received rescue analgesia. Morphine was used for rescue analgesia because our recovery staff were already trained in its use. The onset of peak analgesic effect is slower than with fentanyl, but the duration of action allows for prolonged pain relief. It is not possible to quantify the contribution of the NSAID to the overall analgesic effect. However, given the low pain scores and admission rate, the doses of opioid given were not excessive.

Previous studies investigating the analgesic efficacy and effectiveness of NSAIDs after laparoscopic sterilization have given conflicting results. Rectal diclofenac [4] and oral naproxen [10,11] have shown greater efficacy than placebo. Regimens of unproven efficacy include rectal indomethacin [12], intramuscular ketorolac [13], intramuscular [1] and intravenous diclofenac [5]. The reason for this discrepancy

is not certain. Residual effects of anaesthetic and other analgesic drugs may mask differences in analgesic effect. The onset of action may occur late in the postoperative period, by which time many of the patients will have required rescue opioid analgesia. However, the use of this class of drugs is widespread, often administered by the rectal route [14–18].

In the UK, suppositories are not popular. A recent survey indicated that 54% of patients found the idea of drugs administered by the rectal route unacceptable, all preferring the alternative oral route [6]. It is the practice of the Day Surgical Unit at our hospital to gain informed consent prior to the rectal administration of diclofenac to help patients manage their postoperative pain, in line with the guidelines published by the Association of Anaesthetists of Great Britain and Ireland [19]. The use of oral tablets avoids this need. This study has shown that after laparoscopic sterilization, when combined with early rescue analgesia, oral diclofenac provides an effective alternative to rectal suppositories. It is now our practice to avoid this route of administration where possible.

Acknowledgement

The pharmacy costs of this study were covered by a grant from the St Thomas' Hospital Anaesthetic Research Fund.

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Review

Day surgery—National and international From the past to the future

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Received 1 October 2004; accepted 22 February 2005

Available online 3 October 2005

In February 1981, a working party was formed by the Royal Australasian College of Surgeons, the Faculty of Anaesthetists of the Royal Australasian College of Surgeons (now the Australian and New Zealand College of Anaesthetists), the Australian Association of Surgeons and the Australian Society of Anaesthetists with the inclusion of a group of co-opted members, to prepare the first manual of standards for day surgery. This manual, “Day Surgery; Report and Recommendations”, was published in September 1981 and revised in 1987 and 1997. An expanded revision was completed in July 2004.

In 1987, recognising the potential for future expansion of day surgery, the working party was formalised as a committee and in 1988 changed its name to the National Day Surgery Committee. It was during this same period that an accreditation process was established by the Australian Council on Hospital Standards (now the Australian Council on Healthcare Standards). Clinical Indicators, specifically applicable to day surgery were prepared in 1994 and have been successfully introduced for quality assessment of day surgery practice.

By 1996, the Committee was soundly established as the most informed body on day surgery in Australia. Its activities in all aspects of day surgery practice were expanding; especially the preparation of standards, and its membership had increased to include co-opted representatives from all organisations involved in the provision of procedural services within the health care system. The estimated ultimate potential for day surgery had increased from 50% to 75% (possibly more) of all operations/procedures. Having regard to these increased activities and responsibilities, together with its enhanced authority, the committee changed its name to the

Australian Day Surgery Council in October 1996 and continues as such today.

The first modern, purpose designed and constructed free standing day surgery centre was built in Dandenong, Victoria in 1982 and the first free standing centre on the campus of a public hospital, Campbelltown, NSW in 1984. By 1993 there were 83 such centres; however their numbers have increased rapidly over the past decade—today there are 248 freestanding day surgery centres in Australia and they continue to be built.

Since the publication of “Day Surgery; Report and Recommendations” 1981, the Australian Day Surgery Council has reiterated its stance of equal support for hospital based day surgery units and free standing centres however the development of hospital based units has lagged behind. It is acknowledged that a considerable volume of day surgery is practiced in hospitals, approximately 50% of all operations/procedures. About one-third of private hospitals have day surgery units however I am unaware of any data indicating the number of public hospitals that have dedicated day surgery units. Anecdotally, it seems that most day surgery patients in public hospitals are located in ward beds or, at most, in a day surgery ward. This apparent failure of the public hospital system to fully utilise all the patient and cost efficiencies and benefits of day surgery should be addressed as a matter of urgency.

The International Association for Ambulatory Surgery was formed in 1995 and Australia (Australian Day Surgery Council) is a foundation member. Initially located in Brussels, the Central Office was transferred to London (Royal College of Surgeons building) in 2004. The official journal of the Association is “Ambulatory Surgery”. Currently it has 15 full members, five Associate members (including the Australian Day Surgery Nurses Association) and numerous individual members.

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An important initiative of the Association was the preparation of International Definitions of Ambulatory Surgery, which have been translated into 10 languages. Criteria of standards for various aspects of day surgery practice have also been written and this process will continue. The Association considers these initiatives very important to facilitate the comparison of day surgery practice from one country to another and to assist in the development of this high quality, cost effective procedural service in those countries where it has not been introduced.

The Association holds second yearly International Congresses on Ambulatory Surgery. So far, there have been five Congresses—Brussels, London, Venice, Geneva and Boston; they have all been very successful. The next four Congresses are to be held in Seville (2005), Amsterdam (2007), Brisbane (2009) and Aarhus (2011).

The Australian Day Surgery Nurses Association was formed in 1995 and is totally focused on the advancement of the highest quality, safe nursing practice in day surgery centres/units. It has over 700 members and conducts regular conferences and education sessions for nurses throughout the country. It publishes a journal, three times a year, called “Day Surgery Australia”; it has also produced “Best Practice Guidelines” and they are a credit to them. The ADSNA is a member of the Australian Day Surgery Council and the International Association for Ambulatory Surgery.

So much for the past and the present—what about the future? Day Surgery has not yet reached its full potential in Australia or anywhere else for that matter. Currently, approximately 50% of all operations/procedures are carried out as day surgery although considerable variation from hospital to hospital and surgeon to surgeon still remains! Unquestionably, freestanding day surgery centres are the most patient and cost efficient facilities and it is from these centres that the absolute costs of day surgery practice can be collated. Certainly, the most inefficient model is to have day surgery patients spread throughout hospitals occupying acute beds—so-called “day surgery wards” are not much better. In both models, patients are utilising expensive acute beds, equipment and services and this is more so in the public than the private hospital system. The ideal would be to integrate dedicated free functioning day surgery units within hospitals such that they operate the same as a freestanding centre. An obvious and even better model would be to build the freestanding centres on the campus of hospitals.

So what is the ultimate potential for day surgery? In 1999, Twersky and Showan predicted that by 2005, 82% of all surgery in the USA would be carried out as outpatient (day) surgery and 24% of this would be office-based surgery. Unbelievable—yes, but they are heading that way!

The Australian Day Surgery Council is a unique council totally dedicated to day surgery, just as the Australian Day Surgery Nurses Association is totally dedicated to day surgery nursing. They are unsurpassed as the most informed bodies on all aspects of day surgery in Australia

and will continue to provide their proven expertise for day surgery to achieve its ultimate potential. This will be an onerous challenge as the further expansion will include the most major operations capable of being carried out in day surgery compatible with the highest levels of quality and safety that have already been set and which must be protected.

In order to achieve this further expansion of day surgery it will be essential to introduce the concept of extended (overnight) recovery in day surgery centres/units and post-discharge convalescent limited care accommodation facilities (medi motels). Both concepts are important for more major operations however limited care accommodation facilities have the added advantage of allowing socially stressed patients e.g. elderly, solitary, disabled, etc. and those from rural and remote areas, who would otherwise require admission to acute bed hospitals, to be treated in day surgery followed by a couple of days convalescence before returning home. An added advantage is the cost of limited care accommodation which is approximately half that of acute hospital beds. The Australian Day Surgery Council has published standards for these concepts however the health insurance industry has failed to provide a facility rebate for either!

Office based surgery in purpose built units, which are extensions of medical practitioners consulting rooms, is not yet established in Australia largely due to the failure of health insurers to provide a facility rebate. A large number of more minor operations/procedures, possibly 20–25% could be carried out in such units and the Australian Day Surgery Council has published comprehensive “Guidelines for the Accreditation of Office Based Surgery Facilities” to ensure that standards of quality and safety are not compromised. The absence of an office based surgery rebate is a major disincentive and as such, many of these patients are currently treated in day surgery centres/units at much greater cost.

An important generally acknowledged sequela of day surgery has been its influence on medical education—especially the teaching of undergraduate clinical skills. The big majority of patients with surgical conditions and pathology so essential for teaching clinical skills are now treated in day surgery and for all practical purposes are not available to medical students. This is a cause of frustration and concern to clinical tutors (surgeons) and students alike. One solution is the development of large day surgery centres/units in teaching hospitals to which the majority of clinical education would be transferred while retaining some teaching in acute bed wards. This matter is deserving of urgent consideration by medical schools.

In the international forum, the greatest challenge is to assist the introduction and expansion of ambulatory surgery into those countries where this high standard procedural service, provided in centres/units of low capital and ongoing costs, has not yet been introduced or is in its earliest stages of development. To achieve this, the International Association for Ambulatory Surgery needs to expand its membership

to include such countries. The International Congresses on Ambulatory Surgery are important forums for the propagation of knowledge, experience and expertise in this most valuable procedural service.

In summary:

- Day surgery in Australia and many other countries is established as an indispensable procedural service within the nation's health care system.
- It has not yet reached its ultimate potential and the introduction of extended (overnight) recovery; limited care accommodation facilities (medi motels) and office based surgery units should be vigorously supported.
- There is now an imperative for the Commonwealth Department of Health and Ageing to formalise the recategorisation of procedural services and for health insurers to introduce facility rebates for these concepts.
- The Australian Day Surgery Council is unsurpassed as the most informed body on all aspects of day surgery in Australia and will continue with its activities and in its advisory role to achieve these goals.

- There is sound logic in and great potential for developing dedicated day surgery centres/units in teaching hospitals to become the focus of teaching clinical skills in the medical education curriculum.
- The challenge for the International Association for Ambulatory Surgery is to promote and stimulate the development of day surgery in those countries where this valuable procedural service has not yet been introduced or is in its earliest stages.¹

Lindsay Roberts was Chairman of the Australian Day Surgery Council from 1990 to 2000 and President of the International Association for Ambulatory Surgery from 2001 to 2003.

Acknowledgement

Permission to reproduce this Review, which was initially published in *Day Surgery Australia*, November 2004, is gratefully acknowledged.

¹ In the above text "day" and "ambulatory" are synonyms.