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Surveys

Review of Efficiencies and Patient Satisfaction in Australian and New Zealand Day Surgery Units: A Pilot Study

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SUMMARY

A pilot study was performed in eight Australasian day surgery facilities with a purpose of identifying common trends and differences. A prospective study was designed in which information was collected on 826 patients over a two-week period. Patients were well matched for age, anaesthetic type and mean surgical time. Three facility types were identified and results were statistically corrected for any differences that ASA status, age and surgical time may have made. Patient preoperative waiting time, recovery room times, delayed discharge time and unanticipated admission rates showed favourable outcome trends for free-standing facilities compared with hospital-integrated facilities where day patients had a shared recovery with inpatients. Similar trends were seen with patient opinions of waiting times and recovery periods. In summary, this pilot study has demonstrated the impact of different facility types on efficiencies and patient satisfaction both of which have important cost implications and relevance to those involved in continuous quality improvement processes in day surgery.

Key Words: SURGERY, DAY-STAY: ambulatory, efficiency, patient satisfaction, outcome

In the Australian and New Zealand health care systems there has been increasing pressure on the medical profession to expand the range of day surgery procedures and to perform surgery on "less fit" patients. Stringent dollar budgets in health care are a driving force behind these initiatives, particularly with the recent introduction of "casemix", with fixed payments for each patient procedure[1]. Considering these financial pressures and incentives, it is most important that day surgical patients receive optimal care and that they perceive day surgical management as in their best interests[2]. Day surgical care must also be provided in the most efficient manner to achieve the purported dollar savings[2].

Within the private and public sectors, day surgical practice is performed in facilities of varied organizational types. These facility structures range from free-standing units to integrated hospital systems with either dedicated day surgery recovery rooms or mixed inpatient recovery rooms. The impact of these different organizational structures on efficiencies, and quality of patient care, has been referred to in other published work[3] but no study has reviewed this extensively.

The purpose of this pilot study was to review the influence of differently organized facilities on patient outcome. Specific outcomes measured were preoperative waiting time, recovery room times, complications necessitating patient admission and follow-up information regarding patient satisfaction with the day surgery process. The project was designed as a pilot study with a view to determine the need for a more major outcome review of Australian and New Zealand day surgery practice.

MATERIALS AND METHODS

The Australian and New Zealand College of Anaesthetists Day Care Anaesthesia Special Interest Group (DCA-SIG) has representatives from six Australian states, the A.C.T. and New Zealand. Each representative selected a day surgery facility where staff were able to record accurate information on consecutive day surgery patients and events. The day surgery pilot study was conducted over a two-week period, in March 1994.

Each DCA-SIG representative answered a set of questions pertaining to their particular facility. These

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questions related to facility type and whether a standardized patient assessment questionnaire was used. Facility type classification for this study was as follows:

- Free-standing unit in a purpose-built, self-contained accommodation.
- Architecturally integrated but functionally separate day surgery facility where patients are recovered in a dedicated recovery room.
- Architecturally integrated hospital day surgery unit sharing recovery room facilities with "inpatients" during part or all of the recovery period.

Staff recorded details on patient information, procedure, assessment, anaesthesia, preoperative waiting and recovery room time, delayed discharge time and admissions. Preoperative patient waiting time was defined as the time between patient arrival in the day surgery facility to the commencement of surgery. Recovery room time was defined as the time between patient arrival in the recovery room to the time the patient was deemed fit for discharge. Delayed discharge time was defined as the time difference between when the patient was deemed fit for discharge and actual discharge.

Follow-up information was collected wherever possible by nursing staff or anaesthetists by means of a telephone call one working day postoperatively. Patient opinions relating to day-of-surgery instructions, anaesthesia, surgery, pre- and postoperative waiting times, overall rating of care and preference for inpatient management were sought.

Completed data forms were returned to a central location, where information was entered into a computerized database. Data analysis was performed relating patient outcome to different facility type. Statistical analysis was performed by parametric methods after using a square root transformation to normalize the data and employing Analysis of Covariance to adjust for possible confounding variables such as age, ASA status and surgical time.

RESULTS

Eight day surgery facilities collected information on 826 day surgery patients. Three day surgery facilities were free-standing (N=244 patients), three were hospital-integrated units with dedicated recovery areas (N=259 patients) and two were hospital-integrated units with inpatient mixed recovery room management (N=323 patients).

Staff from six of the eight day surgery units assessed patients prior to anaesthesia with the aid of a patient questionnaire. One free-standing facility and one hospital-integrated unit with a dedicated recovery area involved surgeons assessing patients preoperatively without the aid of a questionnaire. Patient assessments prior to the day of surgery were performed by a range of medical personnel. The percentage assessments performed by these personnel are shown in Table 1. Mean age, anaesthetic type, ASA status and mean surgical time grouped by facility type are presented in Table 2. As there were some differences between facility types in regard to age, ASA status and mean surgical time, results were adjusted for these variables.

TABLE 1

Patient assessments prior to the day of surgery grouped by assessor percentage for each facility type

Assessor	Free-standing N=243	Dedicated recovery N=215	Inpatient mixed recovery N=271
Surgeon	44.5	29.7	29.1
Registered Nurse	31.7	23.7	27.8
Anaesthetist	11.1	9.3	30.6
General Practitioner	0.4	0.9	1.5
Anaesthetist and Registered Nurse	0.0	17.7	0.0
Surgeon and Registered Nurse	0.0	5.12	0.0
Anaesthetist and Surgeon	0.0	2.8	0.7
Anaesthetist, Surgeon and Registered Nurse	0.0	2.8	0.0
Other combination	0.0	1.9	2.6
No assessment	12.3	6.0	7.8

Preoperative waiting times

Mean preoperative waiting times by facility type showed a longer patient waiting time in hospital-integrated facilities using inpatient mixed recovery room care 144.9 minutes (median:125.0) compared with dedicated day recovery 102.8 minutes (median:95.0) and free-standing 72.5 minutes (median:60.5) being half the inpatient mixed recovery waiting time. Patient opinions, recorded in Table 3, indicated that patients recovered in inpatient mixed facilities had a greater tendency to regard their preoperative waiting time as being "too long".

Recovery room times

For all day patient facility types, the mean total recovery room times were longer after general anaesthesia than after either local anaesthesia and sedation, or local anaesthesia alone (Table 4). For all facility types recovery room times were longer after gynaecological laparoscopic surgery than after other common surgical procedures (Table 5). For the five most common surgical operations there were significant trends in shorter recovery room times in free-standing

TABLE 2
Mean age, percentage anaesthetic type, percentage ASA status and mean surgical time grouped by facility type

	Free-standing N=244	Median	Dedicated recovery N=259	Median	Inpatient mixed recovery N=323	Median
Mean age (years)	39.3	35	38.6	36	43.2	43
Anaesthetic type (%)						
General anaesthesia	67.6		68.5		66.0	
Local anaesthesia and sedation	14.4		14.0		23.6	
Local anaesthesia only	18.0		17.5		10.4	
ASA status (%)						
I	73.0		53.0		48.1	
II	22.6		40.1		41.0	
III	4.4		6.9		10.9	
IV	0.0		0.0		0.0	
Mean surgical time (mins)	37.5	35	38.5	32	34.7	30

facilities. Inpatient mixed recovery room facilities had significantly longer times than both free-standing and dedicated day recovery facilities (Table 5).

Mean recovery room times for different facility types and patient opinions of length of recovery room stay, being expressed as "too long", "adequate" or "too short" are shown in Table 6. When mean recovery room time increased from 117.6 minutes in dedicated recovery rooms to 174.6 minutes in inpatient mixed recovery rooms there was a corresponding increase from 1.7 to 10.2% of patients who perceived their recovery room stay as "too long".

The mean delayed discharge time for free-standing dedicated day recovery and inpatient mixed facilities were 18.7 (median:15.0), 28.5 (median:20.0) and 32.1 (median:20.0) minutes respectively.

Patient admissions

Reasons for unanticipated hospital admissions are shown in Table 7. Fourteen of the 26 admissions were surgery-related with free-standing facilities having fewer patient admissions (0.82%) than dedicated day recovery (3.47%). Most admissions occurred in inpatient mixed recovery units (4.64%).

Follow-up information

Day surgery staff reviewed 84.4% of all patients by telephone after discharge, within the first three post-operative days. Of the patients followed up, opinions were sought relating to information given about anaesthesia, surgery and the day of surgery, and preference for inpatient management, as summarized in Table 8. This table illustrates that facility type and good communication impact on patient preference for inpatient management. One hundred percent of

TABLE 3
Patient opinion of preoperative waiting time by facility type

Percentage	Free-standing	Dedicated recovery	Inpatient mixed facility
"Too long"	17.8	15.7	30.6
"Adequate"	81.1	83.0	67.9
"Too short"	1.1	1.3	1.5

TABLE 4
Total recovery times after different anaesthestic techniques grouped according to facility type
Values are expressed as mean and median (in brackets) in minutes

Anaesthetic type	Free-standing	Dedicated recovery	Inpatient mixed recovery
General anaesthesia	99.6 (96.0)	131.6 (120.0)	230.2 (240.0)
Local anaesthesia and sedation	73.5 (65.0)	85.7 (85.0)	84.1 (75.0)
Local anaesthesia only	48.4 (38.0)	66.4 (50.0)	143.3 (111.0)

TABLE 5
Total recovery room times after the five most common surgical procedures grouped according to facility type
Values are expressed as mean and median (in brackets) in minutes

Surgical procedure	Free-standing	Dedicated recovery	Inpatient mixed facility
General Anaesthesia			
Oral surgery	92.5 (95.0)	122.6 (117.0)	209.0 (207.0)
Laparoscopy	123.0 (122.5)	185.5 (185.0)	287.9 (300.0)
Short gynaecological	103.2 (101.0)	147.0 (145.0)	217.2 (234.0)
Local anaesthesia and sedation			
Lens extraction	75.9 (65.5)	95.0 (85.0)	144.8 (111.0)
Excision skin lesions	53.7 (41.5)	52.6 (27.5)	150.5 (130.0)

patients classified their overall rating of care as "good" or "satisfactory".

DISCUSSION

This pilot study demonstrates the impact of different day surgery facility types on efficiencies in day surgery care delivered. In addition, patient opinions of the day surgery service have also been shown to be affected by the different organizational styles of the facilities.

Previous studies have shown that streamlined patient assessments can affect cost-efficiency and patient organization on the day of surgery[4]. This study has shown that a variety of medical personnel were involved in the assessment of the 729 patients reviewed. To achieve cost-efficiency it is important that assessments are streamlined and that interview repetition is minimized. Anaesthetists have much to offer with their expertise in patient evaluation and should be prepared to take a more active role in the assessment process. The percentage of day patients who were not seen prior to the day of surgery was 8.8 (mean "no assessments", Table 1), which raises the question of adequate informed anaesthetic consent in these instances.

Patients undergoing surgery are naturally anxious. For this reason, a sensible approach in day surgery management is to reduce the preoperative waiting time to a minimum. In this study it has been shown that mean preoperative waiting times vary between different facility types with free-standing facilities achieving shorter preoperative waiting times. Patient opinions of waiting times are important and it is appropriate that each day facility should minimize preoperative waiting times as far as possible. In this study a mean preoperative waiting time of 102.8 minutes in dedicated day recovery rooms compared with 144.9 minutes in inpatient mixed recovery room doubled the percentage of patients who perceived that their preoperative wait was "too long". Facility design should provide an atmosphere that is pleasant, relaxing and non-threatening for patients and their families[5].

Previous studies have shown that day surgery recovery room times are affected by procedure and anaesthetic type[6,7]. This study also demonstrates that recovery room times are also affected by facility type with patients in free-standing facilities having the shortest recovery room times. Patients in inpatient mixed recovery rooms had the least favourable recovery room times and the highest percentage of patient admissions (4.64%). Clearly there are cost implications with extended recovery room times. Marais has shown in a previous study that 47% of all day surgery costs are related to nursing salaries and that if recovery room times can be reduced, significant cost savings can be achieved[8]. Hypothetically, in a 4000 case per year unit using mean recovery room times from different style units from this study, one can extrapolate the extra nursing hour requirements. Taking equal numbers of the five most commonly performed procedures from this study and using free-standing facilities as the

TABLE 6

Mean total recovery room times and median (in brackets) and patient opinions of recovery room times expressed as a percentage grouped according to facility type

	Free-standing	Dedicated recovery	Inpatient mixed facility
Mean recovery room times (mins)	87.9 (90.0)	117.6 (110.0)	174.6 (170.0)
Patient Opinions (%)			
"Too long"	2.7	1.7	10.2
"Adequate"	90.3	93.5	87.5
"Too short"	7.0	4.8	2.3

TABLE 7

Unanticipated hospital admissions, number of patients

Reason for admission	Free-standing N=244	Dedicated recovery N=259	Inpatient mixed facility N=323
Anaesthetic-related	0	3	1
Surgery-related	1	4	9
Poor selection	1	2	2
Medically related	0	0	1
Further investigation required	0	0	2
Total % of N.	0.82	3.47	4.64

TABLE 8

Follow-up information

Percentages	Free-standing N=185	Dedicated recovery N=236	Inpatient mixed facility N=270
Information about anaesthesia			
Good	74.1	53.0	62.6
Satisfactory	22.7	43.2	31.5
Poor	3.2	3.8	5.9
Information about surgery			
Good	74.9	56.8	68.9
Satisfactory	24.0	40.2	27.1
Poor	1.1	3.0	4.0
Information about day of surgery			
Good	86.7	65.2	75.6
Satisfactory	12.8	33.5	22.6
Poor	0.5	1.3	1.8
Prefer inpatient management	1.0	3.8	10.6

benchmark for the acceptable nursing requirement, there would be 1.4 additional nurses required per year in dedicated day recovery units and 5.3 additional nurses in inpatient mixed facilities.

In addition to cost implications for prolonged recovery room times, patient satisfaction is also affected. A mean recovery room time of 175 minutes in inpatient mixed units, compared with 117 minutes in dedicated recovery units, is considered "too long" by six times as many patients.

It is of interest that mean patient delayed discharge time varied between 19 and 32 minutes between the different facility types. Other studies have reported discharge delays being due to patient's escort not being immediately available and recurrent pain after home-readiness criteria was met[9]. Minimizing patient delayed discharge times is important in reducing the cost of day surgery. Unanticipated hospital admissions in day surgery also have significant cost implications. The cost to the parent hospital for a day patient admission has been conservatively estimated at $200. Therefore the decision to admit a day patient should be considered as a significant event because of the cost implications involved, the patient expectations of discharge on the same day and the inconvenience that this causes the patient. Convenience of patient admission overnight in the less dedicated day facilities has been alluded to before[10], and this study supports the argument. As in other reviews[6], most admissions in this pilot study were for surgical-related reasons, which highlights the importance of specific surgical training in this field. Surgical credentialling for the newer minimally invasive procedures should also be considered[11].

Patient follow-up information in this study has demonstrated that registered nurses have a valuable role in day patient care, 99% of patients reporting that they received good or satisfactory information from nursing staff and all stating that they were satisfied with the overall standard of care. However, 5% of patients reported that information they were given about anaesthesia was "poor", raising the question of whether we are achieving a consistently high standard of informed anaesthetic consent. Criticism could be made of the means by which the level of patient satisfaction was ascertained, as in this study it was mostly performed by nursing staff and in some instances by anaesthetists. A more consistent standardized objective means of data collection could be considered for future studies.

In this study, the three types of day facility reviewed were shown to have differing effects on management efficiencies and patient satisfaction. Cost savings will be greatest where management is most efficient. Future studies may also demonstrate outcome differences for surgery performed in non-dedicated compared with dedicated day surgery operating theatres. The results of this study are important for those designing new day surgery facilities, also for those involved in continuous quality improvement processes. These processes involve regular review of systems to incorporate steps that produce improved quality outcomes. The results of this pilot study should provide continuous quality improvement teams with challenges in the areas of patient care and day surgery cost management, whilst also demonstrating the need for a more extensive outcome study.

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