A national day only surgery benchmarking basket

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Abstract

The efficient management of day surgery facilities benefits both patients and health administrators. Patients can benefit through minimisation of hospital stay while day surgery has the potential to increase elective surgery throughput and to reduce waiting times. This paper explores whether routinely collected morbidity data from Queensland public hospitals can be used to benchmark levels of day only surgery between hospitals. Thirteen procedures were identified that met criteria for inclusion in a day only surgery benchmarking basket. Queensland public hospitals and individual procedures were benchmarked against one another and analysed to determine whether hospitals performing the 13 procedures demonstrate the same rates of day only surgery.

With the development of a clinically meaningful and administratively simple tool for comparing hospital day surgery rates using routinely collected morbidity data, the opportunity now exists for health services to compare the performance of clinical services both within and between hospitals. It is also suggested that the basket of procedures identified in this study could form the basis of a national day only surgery benchmarking process.

Introduction

In August 1996 Queensland Health released Surgery on Time, a comprehensive plan for enhancing elective surgery services in Queensland public hospitals.

This plan takes a coordinated and comprehensive approach to managing the major elements that affect elective surgery services in Queensland public hospitals. The plan incorporates a range of strategies including funding for surgical equipment and minor works, initiation of projects to increase day surgery, recruitment of staff into specialised training schemes and the development of best practice models for elective surgery services. One of the major components of this plan has been the development and implementation of information systems which provide for corporate reporting of key performance indicators, such as timely and accurate information for the management and monitoring of waiting times for elective surgery in Queensland (Queensland Health 1996).

In the 1993–1998 Medicare Agreement the Commonwealth Government provided financial incentives through the Day Only Procedures Program to increase day surgery rates in the public hospital system. This, coupled with Queensland Health's need to increase elective surgery activity through the Surgery on Time plan created a requirement for a tool for benchmarking day surgery rates for selected surgical procedures. It was also envisaged that this tool would support funding decisions and encourage and reward demonstrated shifts to same day admission and discharge for targeted surgical procedures (Queensland Health 1996).

Given this emphasis, a number of fundamental research questions were raised by the Elective Surgery Project Team within Queensland Health. These questions were addressed in this study and are described in Table 1.

Table 1: Research questions – Day surgery benchmarking

	Question
1.	Can routinely collected hospital morbidity data be used to benchmark levels of day only surgery between hospitals?
2.	What procedures were being performed on a day only basis?
3.	Do all hospitals that perform the procedures do them as day only cases?
4.	Is it possible to describe a basket of procedures that can be used on an ongoing basis for benchmarking purposes?

Pearse et al. (1997) have previously reported on the frequency of overnight admissions for day procedures in New South Wales public and private hospitals. Their aim was to examine the potential for increased bed availability if day services were optimally utilised. They identified 20 procedures that were consistently being performed on a day only basis. They also identified a number of procedures, for example, tonsillectomies and cataract extractions, where patients were having theatre on a day only basis at varying rates at different New South Wales hospitals. The proposition put forward by Pearse et al. (1997) was concerned with 'appropriateness', defined as 'doing the right thing at the right time in the right setting'. They called for the recognition of opportunities to maximise efficiencies in the hospital system by standardising day only services.

The analysis in this paper is based on Queensland public hospital data. However, the authors suggest that the 'basket' of 13 procedures defined in this study could be the basis for further work and comparative analysis on a national basis. The adoption of national coding standards, definitions, classification and diagnosis related group (DRG) grouping systems in Australia provides a basis on which interstate and regional comparisons can now be made. Further development of the 'basket' of day only surgical procedures defined here would be appropriate to enable a national day only surgery benchmarking process.

Definition of 'day only surgery'

There is no nationally agreed definition of day surgery. However, the National Health Data Dictionary defines a same-day patient as one '… who is admitted and separates on the same day' and meets one of a defined list of criteria (Australian Institute of Health and Welfare 1997).

Sibbritt (1992) offers a consistent definition in stating that '...the term day surgery was defined by the 1983 Australian Health Ministers' Conference as a surgical operation or procedure on a patient who can be admitted and discharged safely on the same day'. Sibbritt goes on to differentiate between day only admissions and day surgery unit admissions by qualifying that day surgery patients are pre-booked, and know in advance what form of surgery will be required. Sibbritt also distinguishes and excludes patient admissions for repetitive treatments such as dialysis, chemotherapy, obstetric admissions and observational unit admissions – for example, asthma and concussion.

Measurement of day only surgery

In studies conducted in 1992 and 1994, Sibbritt used a basket of procedures based on codes from the International Classification of Diseases Ninth Revision (ICD-9) to analyse trends and projections for day only admissions and readmissions of day only patients in New South Wales hospitals. He studied 37 procedures, which were defined for inclusion in the basket. Sibbritt's basket included some 'medical' day only procedures such as gastroscopy and colonoscopy.

With the wide acceptance and use of Australian national diagnosis related groups (AN-DRGs) and their clinical refinement, the potential to measure day only surgery using AN-DRGs was investigated. Australian AN-DRGs Version 3.1, in use at the time of the study, included a number of new DRGs for intended same-day stay patients as well as DRGs such as 'Arthroscopy' and 'Endoscopic Procedures (Laparoscopy)'. However, an assessment of AN-DRGs failed to identify a sufficient number of DRGs for accurately describing the true scope for surgical activity that could be undertaken on a day only basis. A further issue encountered was identifying the potential for day only surgery, particularly in DRGs that included a wide range of different surgical procedures. For example AN-DRG 323 'Other Digestive System O.R. Procedures w/o cc w/o Malignancy' includes the International Classification of Diseases Ninth Revision Clinical Modification (ICD-9-CM) procedure code for Exploratory Laparatomy, which is commonly performed on a day only basis, as well as other procedures such as open liver biopsy and other procedures that require overnight admission. The longer lengths of stay for open liver biopsy procedures and others in AN-DRG 323 relate to the technique required and/or possible post-operative recovery time, or the need for observation. AN-DRGs were therefore not regarded as being specific enough for the purposes of describing and measuring day only surgery potential for the purposes of this study.

An alternative approach was therefore required to define a basket of procedures with a high predictive ability of being able to be performed on a day only basis. The principles underpinning the proposed basket of procedures are those described by Eager and Hindle (1994), that is, it should possess the features of being clinically meaningful, be resource homogenous and have the right number of classes.

The use of unstandardised hospital morbidity data to benchmark day surgery rates was recognised a being a poor measure of hospital performance. This was due to the influence that compounding variables such as the rate of elective surgery versus emergency surgery, the proportion of private admissions and the complexity of procedures undertaken has on day surgery rates.

To control for these confounding variables, a day surgery basket of procedures using ICD-9-CM procedure codes was developed. This basket was then used by the Queensland Health Elective Surgery Team to benchmark hospital performance.

Method

Hospital data were extracted from the Queensland Hospital Admitted Patient Data Collection for 1995–96. This data collection is a comprehensive database of all separations from Queensland public and private hospitals. In 1995–96, 136 721 surgical procedures were undertaken in Queensland. Of these procedures, 82% were elective surgery and 18% of an emergent nature (Table 2). Emergency admissions for surgical procedures were excluded from the analysis. The majority of elective surgery admissions in the data set were identified as public patients, with only 25% admitted as private patients (Table 3). Private hospital separations were also excluded from the analysis undertaken. Cases were then selected to the day surgery benchmarking list if they met the following criteria.

1. The admission record contained a principal procedure but excluded 'medical' procedure codes such as dialysis, chemotherapy, gastroscopy and colonoscopy.
2. The admission type was 'elective'. This was defined as patients:
   - whose admission was scheduled (and known about by the hospital at least 24 hours prior to the admission)
   - who were admitted from a booking list
   - who were admitted for planned caesarean sections and inductions.

   (Queensland Health 1997a)
3. More than 1000 discharges (separations) relating to a particular procedure were recorded in the Queensland data collection in the year selected.
4. The patient was discharged alive.

After analysis of the data, 13 procedure codes were identified that met the listed criteria. 'Day onlyness' was defined as cases where the patient's admission date was equal to the discharge date. The rates of day only surgery for the 13 ICD-9-CM procedures were then examined for each public hospital that performed the procedure across Queensland.

Table 2: Cases by surgery type, Queensland hospitals, 1995–96

	Elective surgery	Emergency surgery	Total
Number	112 075	24 646	136 721
Percentage	82	18	100

Note: Variations may be caused by rounding.

Table 3: Elective surgery cases by accommodation type, 1995–96

	Public	Private	Total
Number	84 407	27 668	112 075
Percentage	75	25	100

Note: Variations may be caused by rounding.

Results

The 13 ICD-9-CM codes that were identified as meeting the criteria for inclusion to the benchmarking list are shown in Table 4.

Table 4: Basket of short-stay elective procedures for Queensland hospitals, 1995–96

	Procedure name
1	Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue
2	Other dilation and curettage
3	Tonsillectomy and/or adenoidectomy
4	Laparoscopic cholecystectomy
5	Phacoemulsification and aspiration of cataract
6	Destruction of lesion of cervix by cautery or diathermy
7	Local excision of lesion of breast
8	Laparoscopy
9	Myringotomy with insertion of tube
10	Dilation and curettage following delivery or abortion
11	Arthroscopy, knee
12	Ligation and stripping of varicose veins, lower limb veins
13	Excision of semilunar cartilage of knee

These 13 procedures represent 57% of the day only elective surgical cases which met the criteria and were selected from the Queensland Hospital Admitted Patient Data Collection in the 1995–96 year.

The procedures listed range from excision of skin lesions to ligation and stripping of varicose veins, and cover a range of specialties including ophthalmology, orthopaedics, gynaecology and ear, nose and throat surgery. Table 5 shows the overall rates of day surgery for each procedure.

Table 5: Elective surgical procedures by length of stay, Queensland public hospitals

	Procedure name	Procedure code		Length of stay (days)						
		ICD-9-CM	2	3	4	More than 4 days	Overnight	Same day	Total	Day surgery rate (%)
1	Other local excision or destruction of lesion or tissue of skin and subcutaneous tissue	863	244	73	45	328	540	6 141	7 371	83
2	Other dilation and curettage	6909	228	40	16	31	507	2 672	3 494	76
3	Tonsillectomy and/ or adenoidectomy	282_283_286	389	95	19	16	2 421	193	3 133	6
4	Laparoscopic cholecystectomy	5123	831	473	160	225	1 117	46	2 852	2
5	Phacoemulsification and aspiration of cataract	1341	194	31	22	20	642	1 570	2 479	63
6	Destruction of lesion of cervix by cautery or diathermy	6732	57	6	0	4	199	1 963	2 229	88
7	Local excision of lesion of breast	8521	214	74	60	107	479	895	1 829	49
8	Laparoscopy	5421	112	24	13	34	346	1 266	1 795	71
9	Myringotomy with insertion of tube	2001	38	1	3	4	335	1 341	1 722	78
10	Dilation and curettage following delivery or abortion	6902	134	63	33	61	555	780	1 626	48

continued

Table 5: Elective surgical procedures by length of stay, Queensland public hospitals *continued*

	Procedure name	Procedure code	Length of stay (days)							
		ICD-9-CM	2	3	4	More than 4 days	Overnight	Same day	Total	Day surgery rate (%)
11	Arthroscopy, knee	8026	114	23	10	25	554	891	1 617	55
12	Ligation and stripping of varicose veins, lower limb veins	3859	266	94	21	41	696	313	1 431	22
13	Excision of semilunar cartilage of knee	806	83	12	5	9	353	723	1 185	61
Total			**2 904**	**1 009**	**407**	**905**	**8 744**	**18 794**	**32 763**	**57**

Analysis of the length of stay for the 13 surgical procedures demonstrates that different hospitals have varying rates of day surgery for those procedures. The surgical procedure 'local excision of lesion of breast', for example, shows the variation in lengths of stay between the Queensland public hospitals who undertake this procedure (Figure 1). Overall, 49% of these procedures are performed on a day only basis. However, hospitals D, F, H, S, T, U, X, Y and Z show a significantly different profile to other hospitals. In these hospitals less than 40% of the procedures are performed on a day only basis. Hospital H, for example, performs only 22% of the cases for this procedure on a day only basis.

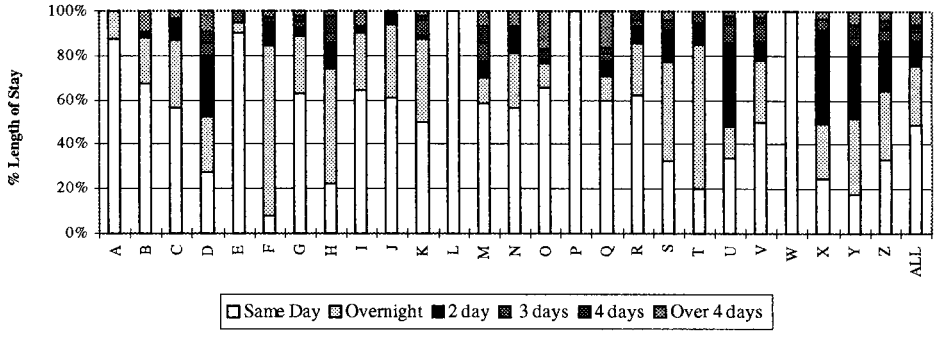

Figure 1: Length of stay for short-stay surgical procedures – Local excision of lesion of breast

On the other hand, the length of stay for the short-stay surgical procedure 'destruction of lesion of cervix by cautery or diathermy' shows little variation between various hospitals (Figure 2). For this procedure nearly 90% of all cases were performed on a day only basis in 1995–96 in Queensland public hospitals. This suggests a consistent clinical approach in managing this procedure on a day only basis across Queensland public hospitals. Nevertheless, for varying reasons a number of hospitals are managing these cases on an overnight basis.

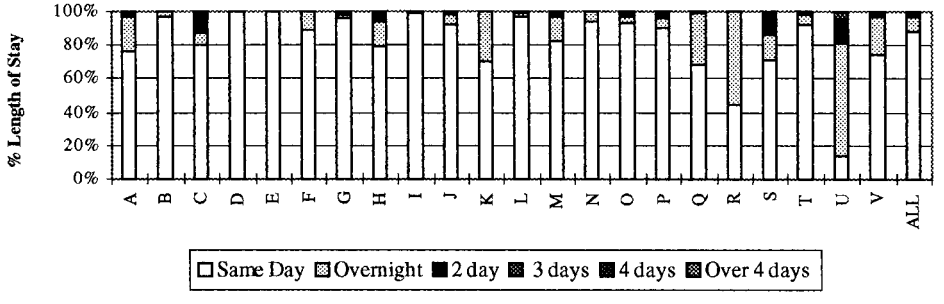

Figure 2: Length of stay for short-stay surgical procedures – Destruction of lesion of cervix by cautery or diathermy

A further analysis that was undertaken examined the potential for an increase in surgical admissions if more consistent management of the 13 procedures in the 'basket' were possible. In this analysis we excluded the cases who stayed overnight and those with lengths of stay of four days and over. This assumed that no additional bed-days would be available through shortening the length of stay of overnight patients and that patients with lengths of stay over four days are outliers. It was hypothesised that cases with lengths of stay of two and three days could be performed on a day only basis. Based on this assumption, there is potential scope for an additional 4922 elective day only surgical cases to be treated in Queensland public hospitals (Table 6). However funding may need to be made available to cover the variable costs of the additional surgical activity performed.

Table 6: Possible increased surgical same-day admissions

Current length of stay	Possible additional number of bed-days obtainable through day only management of selected surgical procedures
Between 2 and 3 days	4922

Discussion

The results show that it is possible to use routinely collected morbidity data to identify a 'basket' of procedures that can be used to benchmark day surgery rates across Queensland public hospitals. The study also identified that public hospitals in Queensland vary in the rates of day only surgery that is undertaken for identical procedures.

There were some concerns noted regarding data quality that will need to be resolved to improve the reliability and consistency of the data for benchmarking purposes. In spite of the existence of National Coding Standards in Australia since 1993, this study showed that some hospitals were not appropriately applying the standards, particularly in relation to sequencing of ICD-9-CM codes. This was evident in the procedure for cataract extraction and insertion of lens, where a number of hospitals sequence the lens insertion first and the extraction second, contrary to the National Coding Standards.

Whilst it is acknowledged that individual risk factors and social and economic issues will preclude some patients from undergoing day only surgery, this study demonstrates that there may be variability in clinical practice within Queensland public hospitals. Alternatively, there could be other factors, such as rural and remote aspects, which preclude or limit day only surgery in some hospitals. These data would also suggest that there is potential for some Queensland public hospitals to explore service substitution and alternative modes of delivering pre- and post-operative care as well as use of pre- and post-surgical hospital-based services such as pre-admission clinics and post-discharge outpatient care.

It is also acknowledged that, in addition to patient factors contributing to variations in day surgery rates, not all public hospitals across Queensland have the same operating capacity for day surgery in some procedures and specialty areas. However, if length of stays were standardised for selected procedures to a day only basis, there would be some opportunity for additional surgical throughput in Queensland public hospitals. However, this may depend upon the availability of funding and other clinical resources.

Conclusion

This study demonstrated the following.

- Routinely collected hospital morbidity data can be used to benchmark levels of day only surgery between hospitals and for specific surgical procedures. In Queensland, the Day Surgery Working Party has recommended that comparative data be provided to public hospitals to encourage the implementation of clinical best practice in day surgery utilisation.

- A range of procedures across different clinical specialties are being performed on a day only basis.
- There is variation between hospitals in the rates of day surgery for specific procedures.
- A basket of procedures can be defined and used on an ongoing basis for benchmarking purposes. However, further work is needed to refine the basket to allow national comparisons and to improve data quality and consistency.

Acknowledgements

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