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## ORIGINAL ARTICLE

# Day surgery in a teaching hospital: identifying barriers to productivity

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## Abstract

**Introduction:** Ambulatory surgery is a standard of care for many surgical procedures due to cost-effectiveness and benefits to patients including the reduced risk of contracting hospital infection by reducing the hospital stay. However, late cancellations can be costly. We examined the utilisation of the surgical day ward in our institution over a four-year period.

**Methods:** A retrospective study of surgical day ward records from September 2007 to September 2011 in one institution. Parameters investigated included the number of planned admissions. Reasons for cancellations were also collected.

**Results:** A total of 17,461 procedures were intended as a day ward admission during the study interval. There were 3,539 procedures that were cancelled (20.3%). The prevalent proportion of cancellations ( $n = 1,367$ ) (38.6%) were due to patients not showing up for their procedures (7.8% of planned admissions); 1,188 (33.6%) patients were cancelled by the admissions office due to bed shortages, accounting for 6.8 % of planned admissions and 650 (18.4%) of cases were due to last minute cancellations by patients, accounting for 3.7% of all planned admission. The remaining 334 (9.4%) of cases were cancelled on medical grounds including patients who were considered unfit for the intended procedure, or anti-coagulations not appropriately ceased prior to surgery, accounting for 1.9% of all planned admissions.

**Conclusion:** The cancellation rate in this study was high, mainly due to failure of patients to attend or signal their intentions, inadequate bed capacity and bed closure strategies. The ring fencing and protection of day beds and a more active patient management interaction would have had the greatest impact on increased efficiency.

## Key words

Day surgery, Ambulatory surgery, General surgery, Cost-effective

## 1 Introduction

Ambulatory surgery is the standard of care for many surgical procedures. It is more convenient for patients, separating planned from emergency surgery and more cost-effective for the health service <sup>[1]</sup>. Patient-perceived benefits of day surgery include treatment suiting their lifestyle needs while allowing them to recover in their home environment <sup>[2]</sup>. Reduction in hospital stay minimises the risk of hospital-acquired infection <sup>[3]</sup> while providing high-quality cost-efficient

care<sup>[4]</sup>. Day surgery appointments are susceptible to last minute cancellations, however, which can cause costly effects to both patients and the health service.

Monitoring late cancellations provides valuable insight into the efficiency of day care services. These data should inform protocols and policies used when selecting patients and procedures to maximise the clinical benefit and ensure safe practice. A dedicated day-care team should be able to provide the pre-operative assessment and investigations to avoid delays and cancellations<sup>[5]</sup>.

Expert consensus (The Audit Commission “Basket of 25”) in the form of Basket 2000<sup>[6,7]</sup> and the British Association of Day Surgery “trolley of procedures”, have helped develop a list of 25 commonly performed procedures suitable for day-case management<sup>[6,7]</sup>. Subsequent outcome-based revisions derived from clinical practice in day-surgery units identified barriers to achieving maximum utilisation<sup>[8-10]</sup>. These included insufficient use of day surgery units, poor management, poor organisation and clinicians’ preferences for inpatient surgery. With increasing financial constraints, improvements in service efficiency while ensuring highest-quality care are of utmost importance. A short audit of day-surgery has been previously published demonstrating increased efficiencies in an Irish rural general hospital<sup>[11]</sup>.

The aim of this study was to evaluate the utilisation of the surgical day ward in our institute, which have a large mixed rural and urban catchment area over a four-year period, focussing on late cancellations as a metric of performance.

## 2 Methods

A retrospective review of the surgical day ward (DW) records, theatre registry book and patients’ medical records was conducted from September 2007 to September 2011. Parameters investigated included the number of planned procedures through the DW (including general anaesthetic, local anaesthetic, sedation and endoscopic procedures), number of admissions and performed procedures, number of late cancellations and the reason for cancellation. Late cancellation in this study was defined as any cancellation on the day of planned procedure leading to unused day bed and theatre time. Data from the DW records were correlated with theatre registry book to ensure accurate recording of performed procedures. In cases of late cancellations, DW records were correlated with patient medical records to confirm or clarify underlying reason. The collected data were tabulated into SPSS V.15 and results are presented using descriptive statistics.

## 3 Results

### 3.1 Day ward availability

Allowing for day ward closures for public holidays, (nine days each year in Ireland) there were a total 1,007 working-days during the study period during which 13,922 procedures were performed in the surgical day ward. The DW was closed by hospital management for varying lengths during the 4-year period, as part of a cost-containment exercise to meet financial targets. The day ward was only operational for a total of 869 days during the study period, because of the loss of 138 working days (see Table 1). This equates to a loss of 2,208 potential procedures during the study period calculated using an average of 16 procedures per day.

**Table 1.** Unused days in each individual year

Period	Total working days	Bank holidays	Working days	Days DW closed	Days DW open
01 Sep 2007 – 31 Aug 2008	260	9	251	20	231
01 Sep 2008 – 31 Aug 2009	261	9	252	63	189
01 Sep 2009 – 31 Aug 2010	261	9	252	45	207
01 Sep 2010 – 31 Aug 2011	261	9	252	10	242
Total	1,043	36	1,007	138	869

Note. DW = Surgical Day Ward

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### 3.2 Procedures

The total number of intended admissions to the DW was 17,461 during the study interval. A total of 13,922 procedures were performed (79.7%) and 3,539 procedures were cancelled (20.3%). The breakdown of each year included in this study is detailed in Table 2. General surgical admissions accounted for 58.7% (n = 8,172), with orthopaedic procedures accounting for a further 17.9% (n = 2,492). Urological, plastics and gynaecological admissions accounted for 7.4% (n = 1,030), 8.5% (n = 1,183) and 2.9% (n = 404) respectively. Dental admissions accounted 2.8% (n = 390), medical admissions accounted for the remaining 1.8% (n = 251). Most cases were done under sedation and LA accounting for 37.3% and 33.2% respectively. Procedures performed under GA accounted for 26.6% of procedures, with the remaining 2.9% requiring neither anaesthesia nor sedation.

**Table 2.** Total number of procedures each year

Period	No. Procedures performed	No procedures cancelled	Total On DW List
Sep/07-Aug/08	3,753	933	4,686
Sep/08-Aug/09	2,960	778	3,738
Sep/09-Aug/10	3,648	852	4,500
Sep/10-Aug/11	3,561	976	4,537
Total	13,922	3,539	17,461

Note. DW = Surgical Day Ward

### 3.3 Cancellations

The majority of cancellations (n = 1,367) were due to patients who did not show up for their procedures and had not called to reschedule (38.6% of cancellations and 7.8% of planned admissions). A total of 1,188 cases were cancelled by the admissions office due to the non-availability of hospital beds, representing 33.6% of cancellations and 6.8% of planned procedures. Six hundred and fifty procedures were cancelled due to patients rescheduling their procedures on the day of surgery (18.4%). Medical grounds for cancellation (n = 334) accounted for 9.4% of all cancellations and 1.9% of all planned admissions. These included patients who were considered unfit for the intended procedure, or anti-coagulations not appropriately ceased prior to surgery. A detailed breakdown of reasons for cancellation on each year is demonstrated in Table 3.

**Table 3.** Reasons for cancellation

	DNA (n)	Cancelled By admission office (n)	Self-Cancelled (n)	Other (n)	Total
Sep/07-Aug/08	41.3% (385)	33.1% (309)	19.8% (185)	5.8% (54)	100% (933)
Sep/08-Aug/09	37.4% (291)	33.0% (257)	19.2% (149)	10.4% (81)	100% (778)
Sep/09-Aug/10	43.4% (370)	22.0% (187)	22.9% (195)	11.7% (100)	100% (852)
Sep/10-Aug/11	32.9% (321)	44.5% (434)	12.5% (122)	10.1% (99)	100% (976)

Note. DNA = Did Not Attend

## 4 Discussion

Day surgery is defined as the process of admitting carefully selected patients for elective surgery to the hospital on the day of their planned procedure and discharged on the same day<sup>[12]</sup>. This treatment paradigm has been shown to benefit the health service by reducing the cost of procedures when carried out on day-case basis with high rates of patient's satisfaction<sup>[13-15]</sup>. This also simultaneously improves throughput of patients, facilitating booking, and reducing waiting lists. But cancellations can be costly, especially if the hospital is not informed.

The cancellation rate in our institute was high but comparable to the rates reported in the literature, which ranged between 11.9% and 23%<sup>[16-21]</sup>. The most common reason for late cancellation in this study was patients self-cancelling and not

attending for their appointments. Late cancellations are undesirable to patients, the hospital and health service. They constitute lost working days for patients and families and as rearrangements are required they are costly to the hospital<sup>[22]</sup>. Furthermore, the loss of theatre time incurs further costs and denies other patients timely access to surgery<sup>[23]</sup>. Recognising that maximum efficacy of day surgery units requires the minimization of patient non-attendances, many initiatives have been described including postal questionnaires<sup>[24]</sup>, telephone call screening<sup>[25]</sup> and telephone reminders. Basu *et al.*<sup>[24]</sup> used postal questionnaire and telephone calls to reduce the cancellation rate from 12% to 2.5%. Similarly, Haufler *et al.*<sup>[25]</sup> used a nurse led telephone screening to reduce their cancellation rate.

A substantial number of cancellations were secondary to non-availability of beds, an issue that has been highlighted previously<sup>[26]</sup>. This was predominantly due to overflow of patients admitted through the Emergency Department (ED) requiring that beds in the DW be assigned to ED patients. In addition the DW was closed for 138 days as a hospital cost-containment strategy. As the hospital theatres were fully staffed and supported during these periods, the closure of the day ward may represent a false economy. We believe this highlights the need for “ring-fencing” of the DW beds as essential to DW efficiency<sup>[27]</sup>.

Procedures cancelled by the patient’s surgical team on clinical grounds accounted for 9.4% of patient’s cancellations. Examples of reasons for such cancellations included insufficient pre-operative workup, anti-coagulant not withheld pre-operatively where indicated or patient no longer requiring surgical intervention. Pre-assessment clinics have been shown to significantly diminish cancellation rate due to these factors<sup>[28-30]</sup>. These clinics address patient expectations and increase understanding of the proposed procedure. In addition pre-operative assessment clinics provide a thorough assessment of fitness for surgery and an assessment of social and home circumstances<sup>[28,30]</sup>. The findings of this present study informed the introduction of a pre-assessment clinic in our institution. We believe that this will reduce the rate of late cancellation and thus improve day ward turnover and productivity.

## 5 Conclusion

The cancellation rate in our institute was high. These findings suggest reduction in utilisation of the surgical day ward when support structures such as pre-admission patient interactive protocols and pre-assessment clinics are lacking. Reduced bed capacity and overflow of patients from the emergency department also negatively impact on the DW productivity. The introduction of measures such as phone or text message reminders to reduce cancellation rates, protected day beds and pre-assessment clinics improve productivity and lead to better utilisation of day surgery facilities.

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## Conflict of interests

The authors declare that they have no conflict of interests.

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