

The Value of Performance and Quality Indicators in the Ambulatory Surgery Unit

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Abstract

Ambulatory Surgery units require ongoing monitoring of Key Performance Indicators to maintain best practice and enhance patient safety. While there are many clinical indicators in use, ambulatory units can often be overwhelmed by the amount of data collected. There is little point in collecting data if it is not appropriately assessed and it is important to

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analyse data in context of the clinical situation before initiating change. All data should be assessed but a root cause analysis is only required when high level data shows deviation from normal. The selection of KPI's can allow focused collection of data, thereby reducing the resources required for monitoring.

Introduction

The ambulatory patient pathway is a series of sequential steps to deliver safe and effective surgery for the day case patient. Patients and the public expect to receive high quality, safe care throughout the pathway. Clinicians and management therefore require monitoring of pathway to measure performance. Clinical indicators are measures of the management or outcome of each step of the pathway which can identify possible suboptimal performance or care. By definition, performance indicators measure quantitative data against expected standards while quality indicators represent non-numeric conformance to a standard and may include the interpretation of personal feelings, opinions or experiences. There is often considerable overlap in performance and quality indicators, but both can reflect issues of patient safety. They are usually collectively known as Key Performance Indicators (KPI's). There is often considerable overlap in performance and quality indicators, but both can reflect issues of patient safety. The interest in performance and quality measurement has been supported by the growing ability to measure and analyse quality of care, through advances in information technology and measurement methodology. However, this gives rise to an enormous amount of data, and without expert interpretation, may be meaningless or even provide incorrect conclusions.

Clinical indicators in surgery are available for most aspects of the patient journey, and although there are fewer directly applicable to Ambulatory Surgery, the data collected can still be vast and difficult

to manage and interpret. Commonly used performance and quality indicators in Ambulatory Surgery in the 3 domains of the patient pathway are shown in Figure 1.

Data for clinical indicators is routinely collected in most Ambulatory Units. Where possible, data should be collected on all indicators to provide a comprehensive overview of the day unit's performance. Unfortunately, data analysis can be cumbersome and time-consuming if not collected electronically and is useful only if collected contemporaneously. Out of date data is of limited value and may be misleading. If a deviation from the expected norm is identified, action to rectify the problem may then be taken. This may require a root cause analysis, requiring further sub-analysis of the data. After initiating a solution to the deviation from expected, the process of data collection then resumes. It is important to interpret raw data within its clinical context and it may be pertinent to assess more than a single data point before taking action.

In many ambulatory units, resources to gather KPI's are often limited. If resources are finite, can a smaller number of clinical indicators, covering as much of the pathway as possible still deliver an accurate reflection of performance?

Overall Day Surgery Performance

The most generic measure of pathway performance is the overall day case rate for the ambulatory facility. Many authorities have suggested targets or expectations for rates of ambulatory surgery when compared to inpatient stay (1). While overall day surgery percentages

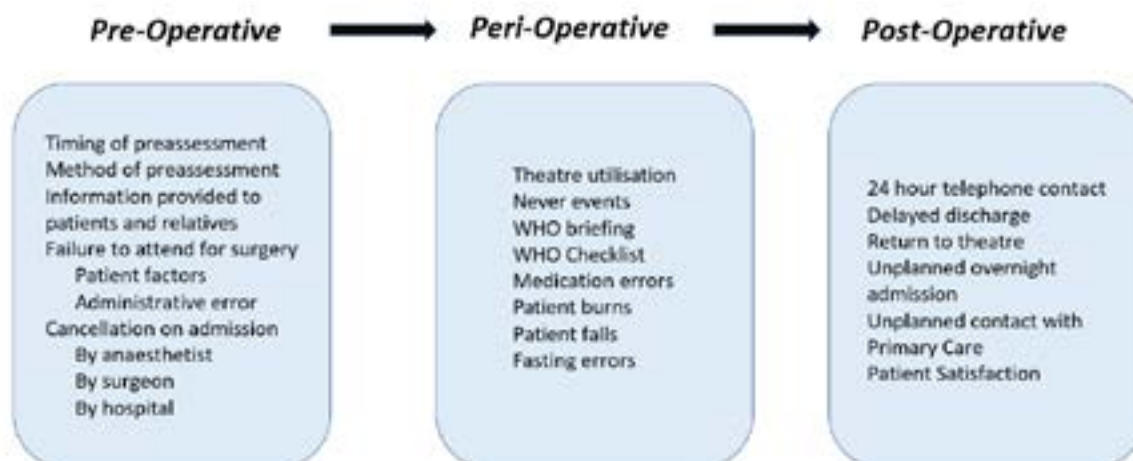


Figure 1 The Ambulatory Pathway.

provide convenient headlines, identifying specific issues contributing to the overall figure is often difficult. Furthermore, achievable targets depend on the day surgery case mix, the facilities available and the day unit's 'default to day surgery' policy. Accepting that every case is a day case until proven otherwise by preassessment or procedure policy will undoubtedly maximise day surgery numbers at the expense of unplanned overnight admissions. In contrast, targeting only the fittest for day surgery will minimise unplanned admissions but disadvantage many who might have been suitable for ambulatory care had they been clinically optimised beforehand. The ambulatory surgery facility available will dictate the spectrum of procedures performed with stand-alone units necessarily having stricter admission criteria to minimise unplanned admissions. Facilities focussing on minor procedures only consider an unplanned overnight admission rate of 1% appropriate while a mixed procedure facility would target 3% as acceptable (2). When considering procedure-specific rates of acceptable unplanned admissions, then target is dependent on the expected day case rate with low expectations accepting higher unplanned admissions and vice versa as shown in Figure 2. (2)

Expected Day Case Rate	Unplanned Admission Rate
>75%	<2%
50-75%	<5%
<50%	<10%

Figure 2 Targets for acceptable unplanned overnight admissions following Ambulatory Surgery.

The Pre-Operative Pathway

The preoperative segment of the pathway is designed to triage elective surgery patients to determine:

- Suitability for day surgery in terms of procedure and co-morbidities
- Optimisation of health before day surgery
- Scheduling attendance for day surgery at the appointed time, appropriately fasted

The timing of preoperative assessment is critical in patient optimisation before surgery. Too early and the patients' health status may change, but too late and there may not be adequate time to

achieve health optimisation as in patients with hypertension. Failure of any aspect of preoperative assessment will be reflected in the patient failing to attend or being cancelled on arrival. The continuous monitoring these patients who fail to receive their procedure is both a sensitive and surrogate measure of preoperative performance. Only if there is variation in expected figures, is a root cause analysis required (Figure 3).

Failure to attend can be patient decision, through an unexpected illness or by a positive action not to proceed with their procedure on the day. Hospital errors through incorrect instructions to the patient regarding date or time of the procedure or incorrect fasting instructions can also lead to attendance failure, although patient fasting errors are not uncommon. The patient may be cancelled on arrival primarily due to health issues which should have been identified at preassessment or as a result of surgical error regarding the necessity of intervention or less likely, resource issues through lack of equipment or surgeon. Cancellation due to lack of hospital resources is a more common scenario in in-patient surgery where lack of in-patient beds may be an issue. Most causes of last-minute procedure cancellations can be traced back to inadequate counselling at preassessment or inaccurate information given regarding their fasting instructions and date/time of admission for their procedure. Therefore, recording procedure cancellations offers an excellent proxy measure of the efficiency and safety of the preoperative pathway.

The Peri-Operative Pathway

The relevant KPI's in the perioperative pathway are related to operational efficiency or operational safety. Patient safety in the operating theatre can be monitored by the incidence of 'never events' and the quality of the WHO Briefing and Checklist. The term, 'never event' originated in 2001 from the National Quality Forum in the USA whose role is to ensure patient safety and healthcare quality through measurement and public reporting (3). Never Events are serious, largely preventable safety incidents that should not occur if the available preventative measures such as guidelines, protocols and checks are implemented. Health agencies throughout the world have their own lists of 'never events' but most are focussed in and around the operating theatre on the day of surgery:

- Wrong site surgery
- Wrong implant / prosthesis
- Retained foreign object

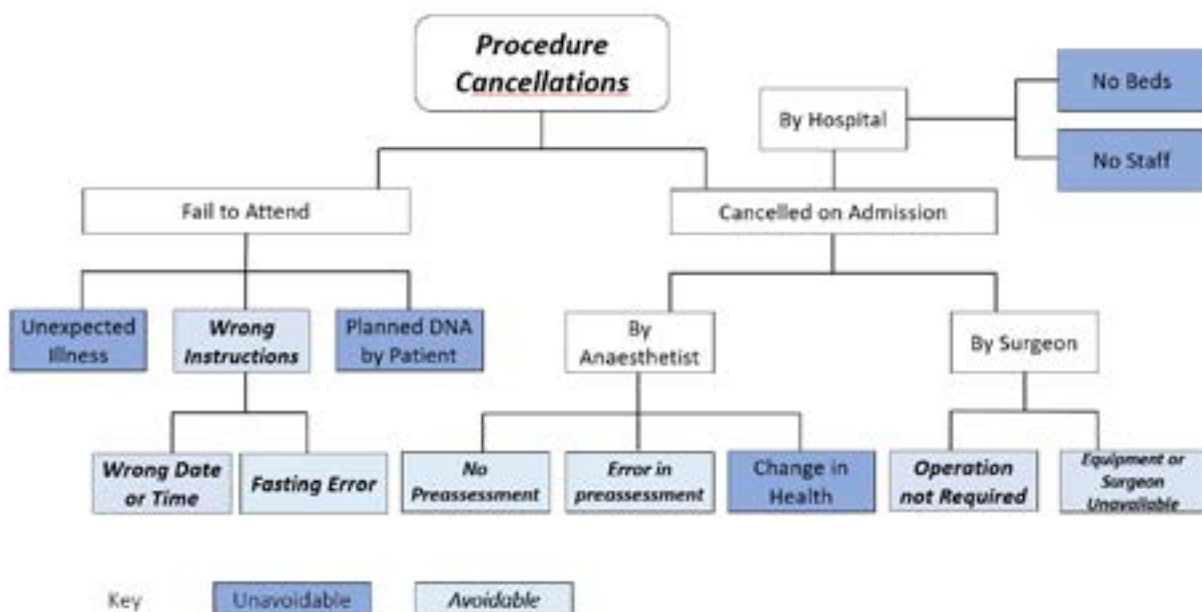


Figure 3 Root cause analysis of procedure cancellations.

- Misplaced naso- or oro-gastric tube
- Medication administered by the wrong route
- Transfusion of ABO incompatible blood components or organs
- Mis-selection of midazolam during conscious sedation

The implementation worldwide of the WHO Surgical Safety Checklist (4) has undoubtedly highlighted 'never events' and has improved safety in theatre by the implementation of the briefing, where each patient is discussed in terms of resources required and the optimum order of the list finalised.

From the hospital's viewpoint, the central focus of perioperative performance is operating theatre efficiency. However, the costs in running an operating theatre will vary as operation costs are difficult to assess as costs vary according to location, staffing, procedure and consumables. However, the basic operating theatre cost in UK has been estimated at 1200 Euro/hour (5) and although this may vary by country, it is clear running costs are significantly high regardless of location.

Defining and measuring the performance of an operating theatre are complicated by many factors and a simple crude metric alone cannot encapsulate the complexity involved. Basic metrics are shown in Table I and can be described merely as an audit of utilisation with no insight as to the causes of inefficiency.

Table I Basic theatre metrics for efficiency.

Sessions scheduled (number)	Operations per list
Sessions held (number)	Patient preparation time (Mins)
Session utilisation (%)	Start time
Operating time available (mins)	Gap time (mins)
Operating time used (mins)	Early finishes (mins)
Operating time utilisation (%)	Over runs (mins)

To determine with any accuracy the causes of theatre inefficiency, a root cause analysis of the causes of loss of theatre time is required and the most sensitive index of performance is the actual usage time of the operating facility (5). This is most accurately assessed by recording the time the operating theatre is in use (touchtime) and the time the theatre lies empty (downtime). The theatre may be unused due to late starts, early finishes and change-over time between patients (Figure 4). In Day Surgery, gap time can be a critical loss of resource due to the high number of procedures on an operating list. By routinely monitoring the touchtime/downtime ratio in individual theatres, service specialties or the entire theatre complex, root cause analysis may be performed if there is a deviation from expected.



Figure 4 Theatre utilisation overview.

Unfortunately, actual operating time in the working day may only be around 60% of available theatre time (6).

The Post-Operative Pathway

An important quality outcome of poor peri-operative care is an unplanned overnight admission. It has a negative effect on patient experience, and it creates pressure on inpatient beds with increased costs to the hospital. Reasons for failure to return home on the day are often multiple and can be related to the patient's condition, issues related to anaesthesia or issues related to the surgery. (Figure 5).

Patient Factors	Hospital Factors
Post-operative uncontrolled pain	Late return from theatre
Postoperative nausea and vomiting	Surgical drain
Urinary retention	Social reasons
Clinical observation	No protocol for discharge
Postoperative bleeding	Surgeon choice

Figure 5 Reasons for delayed discharge.

Protocols to deal with clinical issues may reduce the incidence of unplanned admissions. Algorithms to deal with pain, nausea and vomiting, and urinary retention are well-recognised and frequently utilised (7). Many of the hospital factors are avoidable. Late returns from theatre may be the result of unexpected surgical or anaesthetic problems but more commonly are related to poor scheduling. The basic principle of the ambulatory operating list is to schedule patients with co-morbidities and larger procedures early in the day and to adhere to an afternoon cut-off time for commencement of the last case. The value of surgical drains remains debatable, with insufficient evidence to support their use in the type of procedure performed on an ambulatory basis (8). It could be argued that the surgical drain is inserted to reassure the surgeon rather than offer any safety to the patient. Protocol-based discharge offers safe and efficient discharge for the patient without requiring surgical input and avoids unnecessary delays in discharge if a surgical opinion is unavailable. Failure or delay to discharge due to social reasons may reflect a failure of preassessment, but it is well-recognised that patients may be ambiguous when determining the availability of a responsible adult to escort them home after surgery (9).

Return to theatre should be extremely rare and so each case should be individually reviewed to ensure that lessons are learned.

Readmission after day surgery is an uncommon but serious complication reflecting both the quality of perioperative care and the discharge process. Every readmission should be investigated by root

cause analysis to identify, in each case, the source of the problem. Discharge protocols if conducted properly at the appropriate time are a useful safety screen to ensure the patient is safe to return home. Deterioration after leaving hospital is uncommon. When a readmission does occur, the most frequent causes are pain and wound-related issues. It is important the patient receives good instruction regarding analgesic usage before leaving the day unit as often the pain is the result of inadequate analgesia. Wound problems include haematoma and less commonly frank bleeding from the wound and patients are often readmitted for reassurance rather than active treatment. Readmissions can therefore be considered a relevant proxy measure of the perioperative and discharge processes.

The completion of a telephone follow up call using a structured questionnaire can yield useful information about the service (Figure 6). It provides valuable information about the recovery of your patient and the effectiveness of your policies on pain control and management

of nausea and vomiting. There is evidence that using a daily reporting tool as an App or web portal significantly increases patient satisfaction and impression of their recovery (10).

Conclusions

The measurement and assessment of performance and quality in the ambulatory unit provides essential monitoring data to maintain or improve the patient experience. While there are many KPI's available, data collection can be onerous and requires interpretation. While all data should be monitored, it is only when a deviation from normal is detected that a root cause analysis is required. Even then, it is clear that some KPI's are more illuminating as to performance than others. Ambulatory units require monitoring of performance and KPI's should be selected according to usefulness and resource-effectiveness.

1	Have you felt nauseous (sick)	Mild/Moderate/Severe/Vomited
2	Have you had a sore throat?	Mild/Moderate/Severe
3	Have you felt dizzy?	Mild/Moderate/Severe
4	Have you felt muscular aches?	Mild/Moderate/Severe
5	How much pain have you experienced in last 24hrs?	No pain (0) – Worst pain imaginable (10)
6	How would you rate your current level of pain?	No pain (0) – Worst pain imaginable (10)
7	Have you been able to control the pain?	Yes/No
8	Did you use the pain killers we supplied/recommended?	Yes/No
9	Are you satisfied with the pain relief provided?	Yes/No
10	What does the wound look like?	Normal/Redness/Secretion/Pus/Swelling/Do not know

Figure 6 Simple questionnaire for telephone follow up.

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