

Review

“Best practice” in day surgery units: a review of the evidence

Alan Pearson^{a,b,c,*}, Marilyn Richardson^d, Michelle Cairns

^a The Joanna Briggs Institute, Margaret Graham Building, Royal Adelaide Hospital, North Terrace, SA 5000, Australia

^b La Trobe University, Bundoora, Vic., Australia

^c The University of Adelaide, Australia

^d School of Nursing and Midwifery, Victoria University of Technology, Melbourne, Australia

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Abstract

We summarise the available evidence in three published systematic reviews examining: (i) pre-admission procedures; (ii) admission procedures and (iii) staffing policies in day surgery. Overall, there was a paucity of high level evidence. We found that: (i) a pre-admission intervention can improve patient and surgery outcomes, although the most effective type of intervention should be further investigated; (ii) distraction can reduce patient pre-operative anxiety and (iii) there is no high quality evidence relating skill mix, staffing levels and desired health outcomes in day surgery units. We make a range of recommendations based on lesser evidence, particularly concerned with admission procedures, and suggest areas of future research.

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1. Introduction

Day or ambulatory surgery is performed without overnight admission of the patient prior to or following the intervention.

A wide variety of procedures are performed as day surgery including, but not limited to, ear, nose and throat surgery, gynaecological and orthopaedic procedures, and gastrointestinal and plastic surgery. Patients undergoing day surgery in Australia may attend day surgery centres, either stand alone or associated with a hospital, a ward in a hospital dedicated to day surgery cases, or a smaller specialised centre such as an

* Corresponding author.

E-mail address: aappear@aapt.net.au (A. Pearson).

endoscopy clinic. All of these institutions can provide high standards of care.

Since the 1970s, there has been a dramatic increase in the number of procedures that are carried out as day surgery, so much so that across developed countries it is estimated that day surgery now accounts for between 50 and 80% of all surgical procedures [1–3].

Day surgery offers many advantages to traditional inpatient services: a faster throughput of patients and a fixed time for surgery, reduced demand for night and weekend nursing staff, reduced waiting lists, savings in hospital costs, a shorter wait for children and older people, minimal disruption of normal routine, and reduced costs for the family of the patient [4,5]. However, there are also disadvantages to day surgery such as: nausea, vomiting and other complications if patients are discharged too soon after anaesthesia, inadequate pain control, insufficient rest at home and an extra burden being placed on family members and community services. These possible complications make it especially important that all aspects of day surgery are carried out as meticulously as possible. Such aspects include pre-operative care, care during surgery, and post-operative care including monitoring and assessment, discharge, and follow up via phone post-discharge. All of these elements are considered crucial for the delivery of high quality care and the achievement of positive surgical outcomes for the client.

Additionally, the rapid expansion of day surgery has required novel thinking related to the appropriate mix of staff (i.e. the mix of skill, competence and qualifications of staff). In response to advances in surgical and procedural techniques, increased expectation of patients and societal demands for cost containment new roles suited to day surgery have emerged, such as operating room assistants and anaesthetic technicians [6,7]. Although there may be the misconception that day surgeries only deal with minor surgery, the reality is that more complex surgery is commonly performed [8] and therefore staffing levels and mix must be able to meet these demands.

In Australia, there are guidelines available for accreditation of day surgery units but there are no evidence based best practice guidelines for pre-admission and admission care provided to patients in a day surgery unit. Nor are there any best practice guidelines for adequate and appropriate staffing levels for day surgery units. To redress this imbalance and provide material suitable for best practice guidelines, we undertook systematic reviews on each of these topics, and the results from these three systematic reviews are summarised here.

2. Methods

The systematic reviews were performed by a team of investigators from La Trobe University, the Joanna Briggs Institute and the Day Surgery Special Interest Group of Victoria. A review consultant with expertise in conducting systematic

Table 1
The designation of the levels of evidence according to NHMRC guidelines [10].

Level	Source of evidence
I	Evidence obtained from a systematic review of all relevant RCTs
II	Evidence obtained from at least one properly designed RCT
III (1)	Evidence obtained from well-designed controlled trials without randomization
III (2)	Evidence obtained from well-designed cohort or case-control analytical studies preferably from more than one centre or research group
III (3)	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments
IV	Opinion of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

reviews was appointed for each of the three reviews and an expert panel was established for each review to give advice and guidance to the research team. The membership of the expert panel included nursing, medical and relevant stakeholders such as management personnel. The panel met monthly to review progress. The final meeting of each panel focused on the development of best practice guidelines arising from the systematic review.

Three systematic review protocols were developed:

- The pre-admission care of patients undergoing day surgery.
- The care of patients whilst in the day surgery unit.
- Appropriate staffing models to achieve desirable health outcomes in day surgery units.

The systematic reviews were conducted using an approach based on the Cochrane Collaboration and further developed by the Joanna Briggs Institute (e.g. [9]). The classification system of the Australian National Health and Medical Research Council [10] was used to assess the different levels of evidence (Table 1).

3. Results

Overall, there was a paucity of relevant research, the majority of which was low quality, in each of the fields in which systematic reviews were undertaken (Table 2). No systematic reviews have been previously conducted on these topics, as shown by the absence of Level I evidence. In many cases guidelines were included as expert opinion (the lowest level of evidence, Level IV) in areas lacking primary research, or to support the findings of qualitative studies. A large number of extracted studies that did not meet the inclusion criteria were excluded from the systematic review. The results for each systematic review are presented separately below.

Table 2
Summary of the literature reviewed in three systematic reviews of day surgery

Review Title	#Studies included	Level of evidence				#Studies excluded
		I	II	III	IV	
(i) The pre-admission care of patients undergoing day surgery. . .	6	0	1	2	3	50
(ii) The care of patients whilst in the day surgery unit. . .	19	0	1	2	16	91
(iii) Appropriate staffing models to achieve desirable health outcomes. . .	6	0	0	0	6	49

3.1. The pre-admission care of patients undergoing day surgery

The review uncovered one randomised-controlled trial (RCT) and five other studies of lower level evidence (three descriptive studies, one case control study and one cohort study) [11].

Most of the available research focused on what sort of information could be provided to patients before admission to day surgery. A few studies tested the effectiveness of interventions, with effectiveness variously measured as patient satisfaction, reduced cancellation rates, and the reduction in anxiety levels of patients and families. Two effective interventions were the use of pre-operative telephone screening or questionnaires [12], and a pre-admission appointment a few days prior to admission [13]. Both of these interventions were used to prepare both adults and children for their upcoming operation, and to create an opportunity for nurses to screen those who may be in a position where surgery should be postponed. In comparison, a home visit programme following up from a previous telephone call was no more effective than the telephone call itself in reducing cancellation rates [14].

Although there is little research into the suitability of pre-admission screening criteria, guidelines by the Association of Anaesthetists of Great Britain and Ireland indicate that the patient's willingness to have day surgery, availability of adult care in the home, telephone access and general home situation should all be considered prior to admission. They also indicate that the patient should have the ability to understand the procedure, be in good physical health and be of reasonable weight.

3.2. The care of patients whilst in the day surgery unit

The evidence base regarding admission and patient care whilst in day surgery is based on relatively little primary research [9]. This systematic review uncovered one RCT that could be included as part of the review [15]. This RCT focused on the effectiveness of a relaxation session in distracting patients and reducing patient anxiety and intra-operative anaesthetic requirements. There were 15 other studies (11 descriptive studies, one case control study, one qualitative study, one grounded theory study and one hermeneutic phenomenological study) included in the review. Guidelines produced by the Association of Anaesthetists of Great Britain and Ireland, the Audit Commission of England and Wales and the Royal College of Anaesthetists and the Royal College of Ophthal-

mologists were included as expert opinion in areas where there was found to be no primary research or to support the findings of qualitative studies.

The use of distraction (music and short stories delivered by personal stereo systems) to reduce pre-operative anxiety and intra-operative anaesthetic requirements was supported by high level (Level II) evidence [15]. In terms of local and general anaesthesia, strict adherence to traditional fasting prior to surgery is no longer considered necessary [9]. A majority of anaesthetists would allow a patient undergoing general anaesthesia to consume clear liquids up to 2 h before surgery, a light breakfast 6 h before surgery and solid food up to 8 h before surgery [16]. This finding is also supported by expert opinion for local anaesthesia [17].

In terms of patient discharge, the evidence indicates that tympanic temperature is not a suitable discharge criterion [18]. However, the post-anaesthetic discharge scoring system (PADSS) is a useful criterion, and provided close correlation with results using existing clinical discharge criteria [19].

Although, the vast majority of evidence examining other aspects of patient care in day surgery units was based on the lowest level of evidence (Level IV), patient dissatisfaction in several of these areas was clearly identified. For example, patient satisfaction in the area of admission care was found to be inadequate. Additionally, information prior to surgery did not meet patient needs in terms of preparing them for what to expect from the operation itself, admission care and discharge. Waiting times were seen as unnecessarily long. Patients found that nursing staff dismissed their fears of surgery and anaesthesia rather than adequately dealing with concerns and providing reassurance [9].

3.3. Appropriate staffing models to achieve desirable health outcomes in day surgery units

The systematic review of evidence on this topic revealed an absence of well-designed studies examining effective staffing models [20]. There is little evidence, other than that drawn from expert opinion, to suggest optimal staffing levels in day surgery. The available evidence is largely drawn from expert opinion in general surgical theatres, not day surgery facilities. A number of guidelines examine staffing needs in day surgery and make recommendations on the levels of staffing and skill mix. These guidelines are mainly related to the traditions and/or common practice of the originating country [21,22].

There is no high quality evidence on the effectiveness of Registered Nurses as surgeon's assistants in day surgery units or the role of first and second level nurses and theatre technicians. There is no evidence to indicate the impact of these changes in skill mix on quality and outcomes. Expert opinion suggests minimum staffing levels and identifies specific activities that should be seen as legitimate use of staff time.

4. Discussion

The results of each systematic review will be discussed on their own before a short summary of the available evidence for best practice in day surgery and suggestions for future research.

There are two types of pre-admission care that are considered best practice and have been shown to be useful in improving the pre-admission process for both patients and the day surgery unit. Pre-operative telephone screening or questionnaires, or a pre-admission clinic are considered best practice in preparing both adults and children patients for day surgery. Telephone calls are particularly useful in reducing patient cancellations and non-compliance with pre-admission procedures, and create an opportunity for nurses to screen those whose surgery should be postponed [12]. The evidence indicates that there is no reduction in cancellation rates from following up a telephone call with a home visit. The additional cost of a home visit is not warranted [14]. The value of pre-admission clinics is mainly seen in better patient outcomes, although there were no comparative trials of pre-admission clinics, surveys of patients using a pre-admission clinic demonstrated a high level of patient satisfaction [13,23]. Patient anxiety and state of mind were improved, understanding of the admission process, the importance of fasting before surgery and satisfaction with after-care instructions were all found to have also increased with the provision of pre-admission clinics.

Although desirable, it is not possible to compare the effectiveness of pre-admission clinics and pre-operative telephone calls in providing positive outcomes for both patient and day surgery unit, as no comparative study has yet been undertaken. Although the evidence presented here is the best available, particularly for examination of the pre-admission clinic and screening criteria, it is not particularly high level evidence (Level III (2) and Level IV, respectively). There are no studies that have looked into the use of other educational tools to prepare patients for admission to day surgery. While there was a suggestion that patients would like to receive video and booklet style information, there were no studies that specifically researched this area.

The second systematic review revealed several interesting factors relating to the care of patients in the day surgery setting. Distraction, via music or short stories, was shown to reduce patient pre-operative anxiety across a range of anxiety indicators at a high level of evidence (Level II, [15]). A

reduction in anaesthetic dose and settling time was another benefit of the distraction. This evidence is superior to a lower quality study that showed no effect of distraction on anxiety, using less sophisticated measures of anxiety [24]. We feel that these results confirm the efficiency of a range of distractive measures that are used in the day surgery setting, and suggest that the best practice in day surgery waiting areas is to provide access to such material (e.g. music, television and magazines) where possible.

In terms of anaesthesia, descriptive studies and expert opinion indicate that traditional fasting regimes prior to surgery are no longer necessary for patients undergoing procedures involving local or general anaesthetic. The recommendations of reduced fasting times compared with traditional regimes were first formalised in 1999, at least for general anaesthetic in the United States [25], and have been adopted by the majority of practitioners there in a relatively short space of time [16]. Despite the low level of evidence base, it is apparent that best practice allows for clear liquids 2–3 h before an ambulatory surgery procedure and a light breakfast up to 6 h before surgery. In cases of ophthalmic surgery, where patients are often elderly, anaesthetists claim to be more concerned about the undesirable effects of thirst, nausea and hypoglycaemia that may occur in the absence of oral intake.

Although uptake of the anaesthesia guidelines by practitioners has been rapid, it is apparent that many institutions still have outdated guidelines in place [9]. These need to be changed to reflect changes to practice, and new findings in relation to oral intake and anaesthesia.

The finding that PADSS is a reliable discharge tool indicates that it could be used instead of existing clinical discharge criteria. The PADSS does not require patients to tolerate fluids orally or to have voided prior to discharge. The implications are that under PADSS, patients would be discharged earlier, resulting in an improvement of cost effectiveness with no change in patient outcomes.

The final major finding from the second systematic review was that patients expressed a high level of dissatisfaction with a range of aspects of the day surgery experience. Patients felt that information provided prior to surgery was inadequate and failed to meet their needs in terms of preparing them for what to expect. Information relating to their specific operation, and day surgery in general should be provided—especially in regards to pain and discomfort that might be experienced as patients cope better when prepared for a situation. As information about discharge was a particular area of concern, written information on maintaining personal hygiene, pain relief and pain management and emergency contacts should be provided, so that patients feel confident about caring for themselves at home. Surgery with the least complications should be scheduled for later in the day and better screening and planning should be implemented to ensure that patients do not require overnight admission following a failure to organise transportation home or someone to assist in caring for them.

The third systematic review on appropriate staffing models provided the least amount of evidence. It reviewed the growing body of literature on staffing models in day surgery and documented the establishment of specific roles to improve the pre-admission, admission and discharge processes. There is a distinct lack of quantitative evidence to show whether these staffing models generate best practice. There is no high quality evidence to establish the relationship between skill mix, staffing levels and the achievement of desired health outcomes in day surgery units. It is apparent that practices related to calculating and providing appropriate staffing in day surgery units to ensure best practice have yet to be evaluated in terms of their effect on costs and outcomes.

The lack of studies addressing the complexity of staffing issues in the day surgery unit results in decisions being made based on the number of patients through, rather than complexity of case. An over-reliance on tradition and the maintenance of professional boundaries appears to characterise current approaches to skill mix and staffing levels in day surgery units [20].

5. Summary

Day surgery is an area of expertise still in its relative infancy, having only become prevalent in the last thirty years. It is therefore perhaps not surprising that three systematic reviews of day surgery have revealed many gaps in our current evidence base of ambulatory surgery. The present study proposes four key issues that should be priorities for further research.

1. Many day surgery centres have implemented a system of undertaking pre-admission assessments/interviews in clinics and or via telephone. The most effective form of pre-operative intervention, which maximises patient and day surgery outcomes is unknown and should be further investigated.
2. Early discharge of patients is one of the cost saving advantages of day surgery, but it can also be a cause of complications and deleterious outcomes. Further research into discharge criteria, especially PADSS, which is in common usage, should be undertaken.
3. Areas of admission care that have not been researched, or have only been researched poorly: e.g. intra-operative care itself, management of the operative environment, management of post-operative nausea and vomiting, infection rates, readmission, healing, perceived independence and cancellation rates require further investigation.
4. The rapid expansion of day surgery has impacted upon the decisions related to the appropriate mix of staff including the mix of skill, competence and qualifications of staff. The need to generate substantive evidence on which to base staffing models in day surgery units requires high quality research to generate a sound evidence base.

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