Perioperative nursing: maintaining momentum and staying safe

Jon R McGarry RN BSc DClinP
Charge Nurse, Hampshire Hospitals NHS Foundation Trust, Basingstoke and North Hampshire Hospital

Catherine Pope BA PhD
Professor of Medical Sociology, Faculty of Health Sciences, University of Southampton, UK

Sue M Green RN BSc PhD
Associate Professor, Faculty of Health Sciences, University of Southampton, UK

Corresponding author:

Jon McGarry, Charge Nurse Anaesthetics, Main Theatre, Basingstoke and North Hampshire Hospital, Aldermaston road, Basingstoke, Hants, RG24 9NA. Email: jon.mcgarry@hhft.nhs.uk

Jon McGarry, RN, BSc (Hons), DClinP, is a Charge Nurse in a UK Theatre department. His interests include nursing research and the promotion of nursing scholarship in practice. His background is in Emergency Department and Anaesthetic nursing. This paper arose from his doctoral thesis.

Catherine Pope, BA (Hons), PhD, is Professor of Medical Sociology in the Faculty of Health Sciences at the University of Southampton in the UK where she leads the Emergency and Urgent Care (EmU) research group. Catherine has played a leading role in developing qualitative methods and evidence synthesis in health services research and is co-author of significant books and journal papers on these methods.

Sue Green, RN, BSc, PhD, is an Associate Professor in the Faculty of Health Sciences at the University of Southampton in the UK. Sue is a Registered Nurse and Nutritionist with a background in acute and continuing care nursing, learning and teaching in higher education, and nutrition research. Sue's research and teaching focuses on nutritional care by nurses.

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Abstract

Perioperative practice underpins one of the key activities of many healthcare services but the work of perioperative nurses is little known. A better understanding of their work is important to enable articulation of their contribution to clinical practice. This study observed the practice of perioperative nurses and explored how they described their role. Using ethnographic observation and interview, eighty-five hours observation of eleven nurses were undertaken and eight nurses were interviewed. Thematic analysis was undertaken enabling themes to emerge with two being identified. The first, 'maintaining momentum', described the need to keep people and equipment moving. The second, 'accounting for safety', referred to the need to keep the patient safe during this dangerous period. Tension between these two phenomena was apparent. Perioperative nurses describe one of their key roles as maintaining the momentum of the patient's journey through the operating theatre but having to balance this with the need to ensure the patient's safety. A core component of the perioperative nurse's work is thus management of the tension between these. This study illuminated how these nurses understand their practice.

Key words: Ethnography, nursing, perioperative, operating theatre, safety, workflow

Introduction

Surgery is a crucial component of healthcare, with the World Health Organisation (WHO) estimating some 234 million procedures undertaken worldwide each year (World Health Authority, 2015; WHO, 2017).

In the United Kingdom 40,000 staff are employed to undertake over 10 million surgical procedures a year (NHS Confederation, 2015) across more than 3100 operating theatres in England alone (NHS England, 2016). Perioperative nurses form a large part of the workforce, however their role is not well described and has been the subject of debate (Mitchell and Flin, 2008; Mitchell at el, 2011).

Within the perioperative environment, three types of Registered Nurse with different responsibilities are described (NHS Careers, 2017). These are generally described as anaesthetic, scrub and recovery nurses, identified by the location of their practice. In the UK anaesthetic nurses support in the delivery of anaesthesia (often in an ante-room adjacent to the operating theatre) and scrub nurses assist in surgical procedures in theatre. Recovery nurses care for patients' post-surgery prior to transfer out of theatres (NHS Careers, 2017).

The role of the perioperative nurse has been explored in relatively few studies (McGarvey, Chamber and Boore, 2000; Mitchell and Flin, 2008) and, in common with nursing more widely, lacks clear definition. Bjorn and Lindberg Bostrom, 2008; Schreiber and MacDonald, 2010 discuss nurses' own understandings of their role and suggest that the lack of a clear role definition can hamper attempts to care for patients (McGarvey et al, 2004). Care in the perioperative environment has been linked to continuity (Lindwall et al, 2003) and is based on active cooperation between both the patient and nurse (Lindwall and von Post, 2009). Perioperative nurses have described the ability to 'make people better', often very rapidly, as a significant factor in their choice of career (Mackintosh, 2007).

Other research looked at surgery 'as theatre'. Using the dramaturgical approach of Goffman (1959), Tanner and Timmons (2000),Timmons and Tanner (2004) and Riley and Manias, (2004) have suggested that nurses 'perform' theatrically by learning lines, responding to whispered cues and carrying on despite disruptions. Dramaturgical analyses also suggest the operating theatre is a 'backstage area' (Tanner and Timmons, 2000) closed to the public where private performances and roles are found. While those working in the setting understand these features of practice, they are not well known to other nurses, health care workers or the wider research community.

Allen's (2014) analysis described perioperative nursing work as 'invisible', partially due to its backstage location, but this is reinforced in the literature by the absence of research from nurses' own perspective. This study aimed to make this work more visible, enabling nurses to gain insight from their own experience and using this to articulate their role.

Methodology

Design

This study used the ethnographic techniques of observation and interview to collect data. Participants were Registered Nurses employed in the Perioperative Department of two NHS acute district hospitals in Southern England. One site contained nine theatres providing surgery across a traditional range of disciplines. The other comprised six main theatres. Both departments employed approximately 40 Registered Nurses.

Data collection took place between Autumn 2011 and Spring 2014 in a range of theatres undertaking surgery for different specialities and days. This enabled a broader overview of nursing activity. Three nurses who were observed were interviewed and the other interviews were undertaken with volunteers who had not been observed. Some weeks before the research was undertaken, the researcher visited the department and introduced themselves to the manager and staff to explain the overall purpose of the project.

On observation days, the researcher introduced themselves to the team in the area or theatre being observed and approached one theatre nurse to request consent to observe their activity. Nurses who volunteered for observation acted as the principal focus of observation for that session. Their interactions were recorded with other staff members so as to elicit what they did and said in relation to the work they undertook.   Potential participants were provided with a Participant Information Sheet (PIS) and given at least 30 minutes to consider taking part. The researcher was available to answer any questions. A study consent form was signed upon agreement.

Verbal permission to observe was obtained from all team members present in the theatre and from the patient where consent could be obtained. A poster was fixed on each door of the theatre informing all entering that observation was taking place.

During observation the researcher stood or sat in the periphery of the area and recorded the participant's activity in a notebook, timing each entry. Conversation was recorded verbatim for content and features such as emotional inflection (anger, laughter). Other observations included environmental phenomena (light, noise, odour) and movement of other staff and interactions. All participants were anonymised by the application of a code assigned to them. Immediately following the observation the researcher reflected on the

session in a diary allowing a broad contextual description of the observation. Table 1 shows the eleven nurses observed and the duration of observation.

Table 1 Observation summary

Nursing staff observed	Duration (hours:minutes)
Scrub Nurse	9:15
Scrub Nurse	9:45
Anaesthetic Nurse	9:45
Anaesthetic Nurse	9:45
Scrub Nurse	9:00
Recovery Nurse	9:45
Recovery Nurse	7:00
Recovery Nurse	8:00
Shift Leaders (x2)	8:00
Anaesthetic Nurse	6:00

Interview participants were recruited during unit meetings prior to being approached. Those who expressed an interest were provided a PIS and given at least an hour to consider participating. A date and time to undertake the interview was arranged with volunteers. Interviews were conducted in a quiet room within the theatre suite. Informed consent was obtained prior to starting. An interview guide was used to ensure the aim of the study was addressed and included prompt questions to promote discussion (Table 2). Brief notes were taken by the researcher during the interview to support transcription. The interviews were digitally recorded then transcribed. Interviews lasted for an hour on average.

Table 2 Interview guide questions

Question	Rationale
To begin with, could you please tell me about your nursing career to date? • When did you begin Perioperative Nursing?	Establish rapport and understanding of career
• How would you describe the operating theatres to someone who didn't work here? • Can you describe a 'typical' shift or case that you do so that I can understand your work? • Could you talk to me about what you think are the priorities in your work? • And what would you say are the opportunities and drawbacks of your work?	Explore theatre work from the perspective of the practitioner
• Could you tell me about the team in theatre? • Who do you work with? • Who is in charge? • What sort of things are you able to control or influence? • What positives or negatives do you feel exist within the theatre team?	Gain an understanding of hierarchy and team dynamics as well as a sense of the work
Is there anything you can think of to tell me I haven't asked about?	Enable participant to add any additional insights and comments prior to ending the interview

Ethical considerations

The study protocol was approved by a National Research Ethics Committee (reference number: 10/HO501/17) and permission to undertake the study in two acute hospitals was gained from their Research Offices. Patients within the study were discussed at all ethics committees and it was agreed that they would be informed of the study when they arrived in theatre. The researcher would explain the research to them, its focus on staff in the theatre and guaranteeing their anonymity. Patients were offered the opportunity to decline participation. Patients lacking capacity were excluded from the study and no patients declined participation.

Data analysis

Observations were transcribed into a Microsoft Word document within three days of the event. Data were analysed through a recurring process of reading and commenting, followed by sorting into clusters (or nodes) of related data, working within each field note or interview transcript initially and then looking across the data. This process was assisted

by the use of Computer Assisted Qualitative Data Analysis Software (CAQDAS), in this case the NVivo 10 program to store and retrieve coded sections of the data and map the relationships between nodes. These gradually coalesced into the two main themes of the research. Analysis was supported by reviewing themes and ideas within supervisory meetings at which the development of ideas was tested and defended.

Results

Ten observation sessions totalling 85 hours were undertaken. A variety of surgical procedures were observed including elective and emergency, orthopaedic, vascular and urological procedures. Five female and three male participants with a range of experience were interviewed.

Two key themes were identified. The first, "managing momentum", related to the use of time, work directed to flow and delays, and the allocation of time, which were key factors in each of the nursing roles. The second theme, 'safety', primarily described the large numbers of activities undertaken 'to prevent harm'. The contributing data clusters that underpin these themes are shown in Table 3.

Table 3 Thematic overview

Theme	Contributing data cluster
Managing Momentum	Anticipation: planning and predicting
	Managing intrinsic and extrinsic factors
	Managing time/flow
	Managing emotions
	Failing to manage momentum
Maintaining Safety	Safe teamworking
	Managing the environment

Managing Momentum

Many activities observed or described by the participants related to ensuring the patient journey through the department progressed quickly. Five data clusters fed into this theme.

Anticipation: planning and predicting

The work relating to this cluster was described as anticipating the needs of personnel, equipment or situations that occurred in either the present or future. This anticipatory work

comprised actions that would ensure efficient progression of patients through the day. A key example was deciding at what juncture to send for the next patient:

> *Staff Nurses 15 and 16 and the HCA (Health Care Assistant) are tidying things and putting rubbish into bags. Staff Nurse 9 is watching, sat on a stool by the scrub room. She asks 'Shall we send for the next patient?' to which the HCA replies 'I wouldn't yet.' (Observation session 5)*

This excerpt shows Staff Nurse 9 planning ahead with no obvious cues for this prompt and it was not apparently motivated by any observable action. Interestingly, a junior staff member offers an opinion that is accepted by the team, suggesting that this is an activity common to all staff in theatre.

However, planning was an activity that in itself was stressful, as one scrub nurse observed:

> *"You can plan so much, but you can't assume that everything's going to go wrong. You'd just be, it will just be a massive stress, and actually, at work I know people that are a bit like, what if that [a piece of equipment] goes, what if that goes, then, you're like, whoa, we'll deal with it." (Interview 2, Scrub Nurse)*

Anticipatory work was undertaken at all levels of activity from management of an individual patient's journey to managing future operating lists, in some cases as much as ten days away:

> *Charge Nurse 21 now phones the x-ray department to book two radiographers for a large orthopaedic list next Tuesday. While doing this he adds 'On Thursday again, I've got X (surgeon's name). Any chance of an early start there please?' He is now juggling lists, moving cases to avoid clashes in the need for radiographers. He is successful and very adroit at doing this and achieves the cover he needs. (Observation session 9)*

Here the nurse plans ahead for the next week of surgery on two different days and lists, using his considerable knowledge to best allocate the radiographers to avoid clashes. Interestingly, Charge Nurse 21 was in charge of the department that day, coordinating the activities of the whole department as well as undertaking this work- maintaining the whole

department's momentum. This individual was required, in the words of one co-ordinator, to maintain a '…high level overview about what is going on across the theatre complex.'

Managing intrinsic and extrinsic factors

Nurses work was influenced by factors that were intrinsic and extrinsic to theatres. The actual work undertaken appeared to focus on intrinsic factors, since the majority of extrinsic factors were beyond their influence.

Table 4 Factors affecting theatre momentum

Intrinsic	Extrinsic
Staff not present	Patient not ready for collection on ward
Missing/unavailable equipment	Emergency patients added at short notice
Recovery unable to discharge patient back to ward	Ward too busy to receive patient back from theatre

The need to allocate time for patients requiring emergency surgery was particularly challenging as these patients 'jumped' others on the emergency theatre list. On one occasion, a patient with a life-threatening condition was booked, the coordinator was obliged to add the patient immediately as the next case on the list. They then had to inform other surgeons who had pending operations of this delay. This process took some significant time to organise.

Managing time/flow
The nurses had a very keen sense of time and used this to make predictions about how the day would likely progress:

> *I am having a discussion with Staff Nurse 17 in which he tells me 'They're slow getting started today. You know what that means!' referring to the fact that the Recovery Unit will inevitably get busy once the first cases begin ending. (Observation session 6)*

An anaesthetic nurse observed that the need to maintain safety could also be used to plan effectively. In relation to a surgical safety checklist undertaken prior to operating she noted:

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"There are no surprises. Any potential problems are identified and obviously, it's allowing things to run a bit smoother, because we've already identified any problems, and that's calculated into how things are going to run." (Interview 1, Anaesthetic Nurse)

Managing emotions

Perioperative nurses work also involved managing emotions. Sending for another patient was seen to put pressure on the activities being undertaken in the theatre, particularly when the current patient is still on the operating table:

Staff Nurse 9 enters the theatre. She asks 'Have we sent yet?' Staff Nurse 10 says that they haven't yet. The Consultant Anaesthetist says 'Well, we can send now and (Registrar Anaesthetist) can put the lines in.' Staff Nurse 10 refuses this saying 'We still need to clean the table, mop the floor and the (current) patient's still asleep. Just give us another five minutes.' Her tone has a degree of finality to it. She is resisting pressure to speed up the list it seems. (Observation session 3)

A scrub nurse described the tension that arises particularly first thing in the morning when a lot of the work generating momentum is undertaken:

"I think first thing in the morning it's…everyone's running around going 'waaah!', everything, got everything, got everything, got everything. Have we sent for a patient, have we seen the surgeon, have we seen the anaesthetist? And then you get, like, everyone takes a deep breath and goes (calming sigh) and 'we're done'." (Interview 2, Scrub nurse)

In the Recovery Unit, a failure to discharge back to the wards led to the recovery beds being filled, prompting the nurse in charge to close the unit and delay the next operation, since the previous patient would still be in theatre. This failure would lead to a cascade backwards through the entire theatre, with existing patients unable to enter recovery and new patients unable to enter theatre.

Failing to manage momentum

If momentum failed, consequences were possible:

- surgeries being cancelled (negative for patient)

- overrunning lists finishing late (negative for staff)
- Clinical Commissioning Groups scrutinising cancellations and poor Press coverage (negative for organisation)

For the nurses, the consequences of momentum failure often manifested as an empathic response:

> "Because if we have a, just a short delay, then, you know, it will just have a big impact on the other patients… And the worst one affected is the last patient, and they will get cancelled. … it's my consideration. I always think that what if this is my, this is my relative or something?" (Interview 8, Theatre co-ordinator)

Theme 2: Managing safety

The second theme to emerge concerned "Managing safety", ensuring the safety of patients was described as paramount and featured in all observations of practice.

In the interviews all participants acknowledged that the patient was reliant on theatre staff for their safety and that it was a priority in all aspects of their work regardless of area of practice. This is illustrated by the quotes by various nurses:

> "…ensuring that the patient is safe, and **being there for the anaesthetist, and knowing all the equipment**, and where I could put my hands on it quickly…" (Interview 1 Anaesthetic nurse, added emphasis)

> "Yeah, my **main priorities are my patients' safety at all times**." (Interview 5, Recovery nurse, added emphasis)

> "Being their advocate whilst they're in theatre. So they come in and you make sure that as much as possible their dignity is kept, that they're **kept as safe as possible**." (Interview 2 Scrub nurse, added emphasis)

Two main data clusters contributed to this theme. (See Table 2)

Safe teamworking

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The theatre team is comprised of various people with different roles. However, there were tensions noted in the need for safety checks to be undertaken. For scrub nurses particularly, the notion of 'the count' was a central piece of practice, referring to the need to literally count all of the instruments, swabs and needles in and out of the surgical field to prevent retention in the patient. This activity took a lot of time for scrub nurses and was concurrent with the WHO Surgical Safety Checklist. There was occasional difficulty with getting all of the team to comply with doing this and the scrub nurse often had to raise the issue:

> *Scrub nurse calls out "Can we check the patient please guys- I'm sorry". The surgeons are painting the patient at this point and the WHO checks have not yet been undertaken. Raising her voice the scrub nurse says, "Wait, we haven't checked the patient, sorry!" The team stops and verifies the patient's details.* (Observation session 1)

Here the emotional work of the scrub nurse and safety is illustrated in that she is required to exert herself by raising her voice to obtain compliance with a mandatory piece of safe team working.

Managing the environment

The actual environment of the theatre can be unpleasant for patients, particularly the necessity to keep the patient warm, since the airflows through theatre produce a draught that is cold. Unconscious patients must be protected from this cooling effect, a phenomenon that all the nurses commented upon.

> *"Of course the other is the… again, is the wellbeing of the patient and making sure the patient is comfortable, warm, protected, safe, do what we're doing to the right person, again."* (Interview 4, Anaesthetic nurse)

Here, the nurse makes the link between the patient's wellbeing and being safe, referring here to comfort and warmth as being safe.

The nurses themselves recognised that there was a balance to be struck in their approach to their work:

> *"And my main priority is just to make sure they're safe…so we do have to try and look at getting patients through relatively quickly, but again still maintaining that safety margin."*
> (Interview 3, Recovery nurse)

Having examined the themes that have emerged it is now necessary to consider their implication in practice.

Discussion

A core finding of the research related to 'maintaining momentum'. Momentum in this context is defined as, 'The impetus and driving force gained by the development of a process or course of events,' (OED, 2014). Much of the work that the nurses undertook was related to the need 'to keep things moving', encompassing present work and crucially, anticipatory work. This emerged whether for an individual patient, operating list or indeed the wider theatre department as a whole. Anticipatory work comprises two elements, mental and physical as well as a future (temporal) component. This correlates with Allen's (2014) work on patient flow, suggesting that the nursing work being undertaken here is similar to that of bed managers, ensuring patient flow throughout the hospital.

The sense of urgency surrounding maintaining momentum impacts emotionally on nurses. The concept of emotional labour in theatre is not new (Timmons and Tanner, 2005). When lists ran well and punctually, this produced positive talk and smooth 'processing' of cases. This was interesting because although there is a large body of research on theatre utilisation (O'Donnell, 1976; Cole and Hislop, 1998; Faiz et al, 2008) and process analyses, the data presented here reveal the practical and emotional work required by the nurses to manage schedules.

Anticipatory work was different in different perioperative areas. The anaesthetic nurses were seen to prepare drugs and equipment for the anaesthetists in advance, reducing the time necessary for the induction of anaesthesia. The scrub nurses appeared to utilise the operating lists to review current and future equipment needs for the day which enabled them to prepare appropriate equipment in advance of surgery. The recovery nurses focussed on transferring the patients out of the department. For anaesthetic and scrub nurses, the drive was to process patients into and out of the theatre, then into Recovery for return to the ward. The Recovery nurses experienced maintaining momentum as the need to discharge patients as rapidly as possible. The anaesthetic and scrub nurses interacted in a parallel manner within the operating theatre itself with the recovery nurses acting more

autonomously. This was due to the physical layout of the theatre complex and its segregation into the operating and recovery areas. The nurse in charge kept broader oversight and liaised more with the recovery area to prevent delays.

The physical work related to surgical instrument trays, patient positioning and the use of bulky equipment like camera screens and x-ray machines. In order to undertake these activities successfully, nurses were required to have considerable insight and expertise, products of their familiarity with their work.

Factors influencing the work of the nurse in maintaining momentum were both extrinsic and intrinsic. Pope (2002) suggested 'externally contingent' factors (i.e. not patient or surgeon specific) such as equipment, assistants and other resources that may impact upon the performance of surgery. The observations particularly demonstrated the considerable amount of work that each nurse undertook in managing intrinsic factors. The work of maintaining momentum is largely invisible since it is undertaken by nurses independently from (or occasionally because of) factors related to anaesthetic or surgical issues. The need to constantly anticipate, act and ensure that contingencies are accounted for is central to this phenomenon.   During the study, nurses were seen balancing these issues both in and out of the theatre, often in response to extrinsic factors that they had little or no control over, but had to respond to.

Maintaining momentum

Perioperative Nursing Work
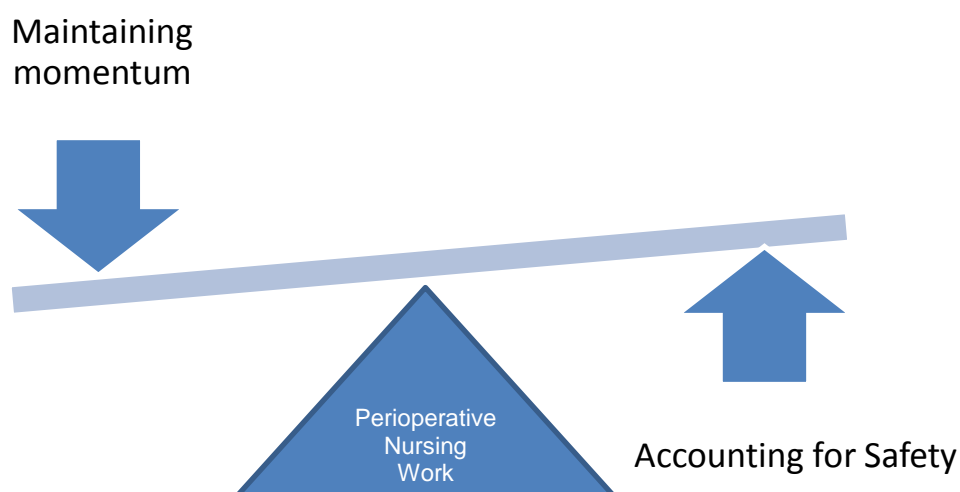
Accounting for Safety

Figure1 Perioperative nursing requires a balance between maintaining momentum and accounting for safety. Surgery that moves patients too rapidly will become unsafe while surgery that focuses excessively on safety will reduce momentum. The perioperative nurses' work must balance these contrasting needs.

Allen's (2014) work on managing patient flows through the hospital noted that '…little is known about the everyday processes through which these challenges are addressed.' Maintaining momentum is a way of conceptualising the perioperative nursing role as it is little known and hidden. Perioperative nursing can be understood to be a continual balance between the two imperatives of maintaining momentum and safety. Becoming a skilled practitioner requires the knowledge and ability to achieve this balance and then ensure it is maintained for each individual patient and the entirety of the operating list. For various nurses in theatre the factors affecting the balance differ but the requirement to reconcile them remains the same, with negative outcomes being very real. More positively, the satisfaction of achieving this balance is a very real reward for theatre nurses. Successfully balancing or managing these two imperatives constitutes 'care' in this strange clinical environment.

Study limitations

The main limitation of the study was its relatively small scale and being undertaken by a lone researcher (also a perioperative nurse). The potential for researcher bias was managed within the supervisory relationship, with the author being required to explain and defend the analysis to impartial scrutiny. The potential for the participants to alter their behaviour as a result of being observed (the Hawthorne Effect) was a possibility. The fact that the author was a perioperative nurse looking at practice and not involved in any managerial assessment hopefully led to natural behaviours being observed.

Conclusion

Momentum in theatre nursing work provides a way of understanding the role. It must happen alongside the imperative to maintain the patient's safety requiring a balance be struck between the two. Perioperative nurses experience a tension in maintaining this balance. This understanding addresses a gap in the research about what theatre nurses do, and their views about what they do. As surgery is a core activity in all healthcare systems, this knowledge about the invisible work of perioperative nurses will be useful to practitioners and researchers alike.

> **Key points for practice and/or research**
> - Perioperative nurses are required to maintain momentum and simultaneously account for safety.
> - Maintaining momentum requires constant effort to ensure that patients move through the perioperative journey.
> - The imperative to maintain momentum is often in conflict with the need to account for safety and this tension has to be resolved.
> - The findings will inform future research investigating the contribution of the perioperative nurse to safe and efficient perioperative practice.

Ethical considerations

The study protocol was approved by a National Research Ethics Committee (reference number: 10/HO501/17) and permission to undertake the study in two acute hospitals was gained from their Research Offices.

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