

Understanding perioperative nursing

Eileen M Scott RGN, FETC, Cert IRS, BA(Hons) M.Litt, is Research Fellow, North Tees and Hartlepool NHS Trust, Christopher Earl RGN, is Orthopaedic Theatre Manager, Castle Hill Hospital, Cottingham, David Leaper FRCS, University of Newcastle upon Tyne, Maria Massey RGN, Dip PNS, is Clinical Nurse Manager, North Tees and Hartlepool NHS Trust, Judy Mewburn RGN, is Nurse Consultant and Chair of the RCN perioperative nursing forum, Neil Williams BSc(Hons), DPSN, RGN, is Charge Nurse, Chelsea and Westminster Hospital, London.

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Perioperative nursing is a complex arena that involves various roles and procedures. The authors here argue that the key to success is good multidisciplinary communication.

Aims and intended learning objectives

The aim of this article is to give insight into the collaborative nature of perioperative nursing and its role within the multidisciplinary team, explaining how knowledge of individual characteristics ensures patient safety and prevents complications. After reading this article you should be able to:

- Appreciate the value of pre-operative visiting.
- Understand the principles involved in preparing a patient for anaesthesia.
- Demonstrate knowledge of the methods of preventing complications such as hypothermia and pressure sores.
- Discuss the principles of post-operative pain management.

Pre-operative visiting

Pre-operative visiting affords perioperative nurses the opportunity to demonstrate their role as the patient's advocate and their invaluable contribution to the theatre team. Nursing care is only as effective as the plan on which it is based (Tierney 1984), and care can only be planned with knowledge of the patient. Positive outcomes can be achieved through pre-operative intervention with surgical patients, and it can be argued that nurses who do not already include psycho-educational interventions in their care of surgical patients should consider incorporating them in their practice.

Although one might imagine that the patient's anxieties are in proportion to the severity of the surgery proposed, this would be an oversimplification. All patients are unique, with their own fears and anxieties. These should be assessed and full explanations given if the patient is to come to the operating theatre in a confident frame of mind. There are several fears that patients have in common about surgical interventions and their outcomes. Many worry about the length of time that they will be unconscious, and one of the main worries is fear of death; most patients need reassurance that they will wake up from the anaesthetic. An explanation of the usual time schedule for a procedure gives patients something to focus on and is also very useful when arranging for relatives to visit after surgery. Many patients need a lot of reassurance to feel confident, and often the knowledge that a familiar face will be there with them in theatre – and when they wake up in the recovery ward – is helpful.

Some patients are familiar with anatomy and physiology, and are grateful to have a serious and sensible discussion about their proposed procedure. Patients might have already had discussions with medical staff, only to find that they have forgotten half of the surgeon's words, or forgotten to ask the anaesthetist the relevant questions. Pre-operative assessments provide an ideal opportunity to discuss

Introduction

It may be several years since you were in an operating theatre or other area where anaesthesia and surgery take place, in which case you may be surprised at the changes. Or, perhaps you have never seen an operating theatre and would be interested to know what perioperative nurses do. Our environment relies on effective multidisciplinary team work and, because of this, the emphasis of this article is on the roles played by different members of the team. It is this interaction that makes the operating department such a dynamic and challenging area in which to work.

TIME OUT 1

Consider the responsibilities of managing an operating department with a recovery ward and several theatres, each involved in different surgical specialties. Think about the problems that the clinical nurse manager faces on a day-to-day basis. Keep your ideas in mind while you read the article.



key words

- Theatre nursing
- Anaesthesia
- Pain: postoperative
- Surgery: patient care

These key words are based on the subject headings from the British Nursing Index. This article has been subject to double-blind review.

such problems, and to arrange for another talk with the surgeon if necessary. If patients are to have major surgery which will substantially alter their body image, it is sometimes helpful to arrange a meeting with a patient who has had similar surgery. Some hospitals have groups that can facilitate such support, and these have proved to be a valuable source of encouragement.

The relevant specialist professionals – for example, stoma nurse specialist or speech therapist – should also be involved in pre-operative consultations. Pathology may be an issue as many operations are diagnostic, and the possible outcome can be even more worrying than the operation itself. The patient needs information about how long it will be before any results are available.

It is important to recognise that, in carrying out pre-operative visits, theatre nurses are not trying to 'take over' from their nursing colleagues on the surgical wards. There is, in fact, additional information – which supplements that given by the ward staff – that the perioperative nurse can give to help to reassure the patient. From the patient's perspective, the knowledge that a nurse, with whom he or she has already formed a relationship, will be there in the unfamiliar – and sometimes intimidating – theatre environment, is comforting and reassuring.

Preparing patients for anaesthesia

Patient identity and documentation The delivery of anaesthesia is a common and normally safe practice. However, because of shorter hospitalisation and reduced pre-operative preparation time, there is an increased potential for omissions to occur and ultimately for adverse patient outcomes. To ensure patient safety, it is essential to promote good communications between the ward and the operating department.

The patient-preparation process for anaesthesia is complex, and safety must be maintained on transferring care to the perioperative team. This involves the transfer of all necessary information and the relevant documentation. It is easy to take basic safety measures for granted, but experience demonstrates that even the seemingly obvious cannot be assumed.

Box 1. Examples of patients at risk of aspiration

- Patients with abdominal mass or intestinal obstruction
- Pregnant women
- Patients with hiatus hernia, oesophageal reflux or other oesophageal pathology – for example, achalasia cardia, oesophageal pouch, tumour
- Patients who have suffered traumatic injury
- Patients suffering acute pain
- Patients who have consumed alcohol
- Patients receiving opioids
- Obese patients
- Patients with abdominal mass or intestinal obstruction

Therefore, establishing the correct patient identity and proposed procedure is paramount (NATN *et al* 1998).

The patient should wear two identity bracelets, in case one has to be removed for venous access. These should be sited on different limbs, be written on in indelible ink and contain essential data. In the unlikely event of both identity bands being removed, immediate replacements are made and the details checked against originals. Details should match exactly those on the patient's notes, consent form and operating list.

Once the correct patient identification is established, the proposed operative procedure is confirmed by examining the documentation and a final confirmation is made with the patient. Although the sedated (premedicated) patient may be unreliable in providing detailed information (NATN *et al* 1998), it is acceptable to ask the patient to confirm the presence of his or her signature on the consent form.

In the case of surgery where the operation site may be confused (for example, in orthopaedic surgery), the site should be marked with indelible ink on the patient's skin and this detail carefully checked with the consent form. There should be no abbreviations on any of the documentation. Ultimate responsibility for ensuring the correct patient receives the correct operation rests with the clinician actually undertaking the procedure (NATN *et al* 1998). However, this does not remove the collective responsibility of the multi-disciplinary team to ensure that correct checking procedures are adhered to.

Fasting Pre-operative fasting is standard practice; it is required to prevent the patient from regurgitating or vomiting, and subsequently aspirating, stomach contents. 'Nil by mouth' status must be ascertained so that the safest anaesthetic technique can be selected. Traditionally, fasting periods have been rigidly enforced and often little consideration has been given to the total time patients are without food or drink.

However, it has recently been demonstrated that in healthy patients undergoing planned surgery, the intake of clear fluids two to three hours prior to induction of anaesthesia is safe (Goresky and Maltby 1990, Greenfield *et al* 1997, Phillips *et al* 1993). Caution is indicated, however, as for some patients reduced fasting times are inappropriate because they have an increased risk of aspiration of stomach contents (Box 1). In these patients, the fasting time should be agreed with the anaesthetist. It should also be noted that a rapid-sequence induction of anaesthetic can be employed for these patients, or in emergency situations when a patient's fasting status is unknown. In some instances intravenous fluids are indicated pre-operatively to correct dehydration.

Allergies The anaesthetist and the surgical team must be aware of any allergies the patient has to drugs, to contact substances such as skin preparations or to materials such as latex. It is the anaesthetist's responsibility to ascertain if the patient or his or her immediate family has suffered any problems with anaesthetics.

Other checks and tests Further checks are made of the patient and his or her property to ensure safety and comfort. Cosmetics and nail varnish should be removed as these may disguise clinical signs (peripheral cyanosis) or interfere with monitoring equipment

(such as pulse oximetry). Contact lenses should be removed to prevent corneal abrasions and jewellery should be removed or taped securely.

Hearing appliances and dentures often cause problems. The former must be removed to prevent inadvertent damage, and the latter must also be removed as they may otherwise dislodge and make airway management more difficult. Because patients may feel self-conscious, or communication may be hampered, these need not be removed until the patient is in the anaesthetic room.

Communication is also difficult for patients who do not speak English. The use of a professional interpreting service is essential, and it is not acceptable for relatives to act as interpreters; they too may not fully understand medical terminology and this is also a particularly stressful time for relatives.

Several other factors are important in the continuing care of the patient. Pre-existing medical conditions such as diabetes, epilepsy, cardiac conditions, arthritis (and other conditions that restrict range of movement) and poor skin condition must be clearly documented. This allows for appropriate measures to be taken (such as blood glucose monitoring or special operating table adaptations). It is also important that the perioperative team is aware of any implanted prostheses, such as metal joint replacements and pacemakers, to ensure safe use of electrosurgery. It has been suggested that the patient-earthing electrode should not be placed over such implants (NATN *et al* 1998).

Various blood results are also required, as dictated by the clinical condition and circumstances of each individual patient. Commonly used tests are shown in Box 2. Patients whose ethnic origin suggests that sickle cell disease may be present require additional blood tests before anaesthesia. Other pre-operative tests are essential – for example, urinalysis to detect undiagnosed conditions such as diabetes or a urinary tract infection. Usually, all patients over 50 years require an ECG and those over 60 years also need a chest X-ray. These results must accompany the patient to theatre. In addition, a minimum of one full set of baseline vital signs should be recorded, including heart rate, blood pressure, oxygen saturation, temperature, weight and height. This information is essential to the perioperative team in assessing drug dosages, the patient's ongoing condition and recovery from anaesthesia.

All these routine preparations are important. It is only by thorough and rigorous attention to detail and effective communication that safety can be maintained during an extremely vulnerable period of a patient's experience.

TIME OUT 2

Think about a patient who already has complex problems and needs to come to theatre for surgery that will involve stoma formation. What measures should be taken to prepare this patient both physically and psychologically for theatre, and to plan the post-operative care and rehabilitation?



In addition to the usual problems facing any patient who is undergoing major surgery, this patient will need specialist support from a stoma therapist nurse, not only to come to terms with the reasons why this surgery needs to be performed, but also to cope with the psychological and practical problems of dealing with a stoma. This additional support needs to be implemented prior to surgery so that the patient has the opportunity to develop a relationship with the specialist nurse. In addition, any further nursing intervention will depend on the complex problems that this patient already has. If there is any impairment to communications ability, then special measures may need to be implemented and planned in partnership by ward and theatre nurses.

Box 2. Routine blood tests before surgery

BIOCHEMISTRY

- Urea and electrolytes
- Liver function tests

HAEMATOLOGY

- Full blood count
- Clotting factors
- Cross match
- Sickle cell status

Temperature control

Hypothermia Hypothermia, defined as patient core temperature of less than 36°C (Vaughan *et al* 1981), is a common side effect of anaesthesia. The degree of heat loss may be influenced by ambient temperature (Frank *et al* 1992) and skin preparation methods (Sessler *et al* 1993). Older patients are more at risk (McConachie 1996), and it is more likely to occur in operations when large surface areas of the body are exposed, when the peritoneal cavity is opened or when large amounts of unwarmed irrigation fluids are used. Interventions are designed either to treat hypothermia (during surgery or in the recovery ward) or to prevent it occurring. Several methods are

Box 3. Methods of preventing and treating hypothermia

- Forced-air system (for example, Bair Hugger™)
- Warming of intravenous and/or irrigation fluids
- Warming under-blankets and table pads
- Pre-warmed blankets to cover the patient
- Deliberate control of ambient temperature
- Use of 'space' blankets in recovery

Box 4. Some possible effects of intra-operative hypothermia

- Delayed drug metabolism
- Peripheral vasoconstriction
- Wound infection
- Cardiac event
- Increased intensive care stay and overall hospital stay
- Increased intra-operative blood loss/increased need for blood transfusion
- Shivering and increased metabolic demands post-operatively
- Need for re-warming therapy in recovery ward
- Increased stay in recovery ward
- Reduced patient satisfaction (Leinonen *et al* 1996)

available (Box 3), which can be used either in isolation or in combination. One of the most effective methods is the forced-air system which can be combined with the warming of intravenous fluids. Although clinicians have been aware of intra-operative hypothermia for some time, it is only recently that knowledge has been gained about the possible side-effects (Box 4) (Sessler 1997). In the recovery ward, low temperatures can sometimes be accompanied by shivering, which not only increases oxygen demand but can also be distressing for the patient. However, the absence of shivering does not mean that hypothermia is not present. Tympanic thermometers are one of the most effective methods of measuring core temperature, which should always be monitored as routine practice. Ward nurses can play an important role in ensuring that patients are kept warm pre-operatively, and that they come to theatre with adequate bedding.

Malignant hyperthermia The patient's capacity to control body temperature is inhibited by anaesthesia (Sessler 1997). Very rarely, this can result in malignant hyperthermia (MH) which, if not identified, has potentially fatal consequences. MH is an inherited condition, which is known to be triggered by certain anaesthetic agents (Dyke 1997). It has a rapid onset and results in the patient becoming tachycardic, hypotensive and febrile, reaching temperatures of 40°C in some cases. Early identification improves patient safety, and this is therefore a condition of which all nurses caring for surgical patients should be aware.

Patients who may be at risk (Abraham *et al* 1998, Brownell 1988) of developing MH during anaesthesia are:

- Those with a history of previous episodes of MH and their immediate relatives.
- Those with Duchenne muscular dystrophy or from King-Denborough syndrome.
- Perhaps, those with a history of heat stroke.

If an episode of MH occurs in theatre, it is a critical event and treatment protocols involve the intravenous administration of large amounts of dantrolene sodium. It has been possible to reduce the mortality rate from over 70 per cent in 1960, to 5 per cent today (Dyke 1997). This is because of improved vital signs monitoring available in theatres, the development of effective drug therapy and improved awareness of all members of the perioperative team to the potential dangers. While most perioperative nurses will never have to deal with such a crisis, they are all aware of it. Non-perioperative nurses, as part of their role of preparing patients for surgery, should also have some knowledge about this potentially life-threatening problem.

Preventing pressure sores

Pressure sores are a complication of hospitalisation, and all surgical patients are particularly at risk during the perioperative phases of their care. This is not just because of immobility while the operation is carried

out, but also because of the circulatory and metabolic changes which result from anaesthesia and surgical trauma. This means that pressure sores which begin in the operating theatre may have a more complex aetiology than other hospital-acquired sores (Scott 1998a). Despite their shared vulnerability, not all surgical patients develop pressure sores. Theatre is, however, sometimes seen as the cause of any pressure sore which a surgical patient might develop (Waterlow 1996). Surgical patients are cared for through a complex programme involving different groups of nurses, at the very least, in the operating theatre and the surgical ward. There is also often involvement from the A&E department, the intensive care unit and sometimes the rehabilitation wards. It can be difficult, as each patient moves through these environments, to complete the evaluation phase of nursing care.

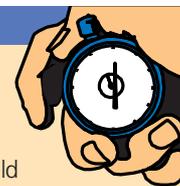
Evaluation can be made more difficult because of the nature of pressure sores. Knowledge about the dynamics of tissue breakdown shows that pressure damage may not always be immediately apparent (Kosiak 1961). This delay may be hours or even days. It is, therefore, difficult to identify not only when the damage took place, but also its exact cause. Theatre nurses may thus find it difficult to evaluate the effectiveness of their interventions.

The main factors associated with pressure damage are the intensity of the pressure and its duration. However, the different capability of individuals to withstand a pressure insult is also important (Scott 1998a).

Usual prevention strategies include changing the patient's position, which is obviously not an option during surgery. So perioperative prevention tends to focus on the use of special mattresses and overlays. Clinical trials testing the effectiveness of these mattresses in preventing pressure sores is limited, although a recent study has shown that dry polymer gel pads may be more effective than a standard theatre mattress (Nixon 1998). In addition, further research is also being carried out investigating how surgical patients develop pressure sores (Scott 1998b).

TIME OUT 3

Think about which surgical patients might be more at risk of pressure sores than others. What provisions do you think could be made in preparation for a high-risk patient returning to the surgical ward from theatre? In your area of work, are your pressure sore prevention strategies determined by local policies and procedures, or do you feel able to exercise your own judgement? Have you any knowledge deficits that further education could address?



The risk of developing pressure sores depends on the patient's mobility impairment. Dependency is related to the degree of surgery and to the sedation level/immobility which results from the pain control regime. For example, patients with an epidural *in situ*

for post-operative pain control have impaired leg movements and are particularly at risk of developing heel pressure sores. Alternatively, patients receiving high levels of opiates may be heavily sedated and thus immobile. Pressure sores can be prevented by reducing the intensity of the pressure by the use of special mattresses and overlays. In addition, turning regimes can be implemented for patients who are unable to relieve their own pressure areas.

It should be noted that any high dependency in post-operative patients is relatively short in duration. Most patients need intensive assistance with position changes for the first 24 to 48 hours – and some of them for much less than this. Surgical ward nurses are in a unique position in that they are able to predict with a high degree of accuracy the dependency level – and its probable duration – of their patients on the return from theatre.

Perioperative nurses need to be vigilant about preventing pressure sores and to ensure that their practices are based on sound evidence. They also need the assistance of the surgical ward nurses, who should let the theatre nurse know before the patient arrives if he or she is thought to be at a high risk or has existing pressure damage. Additional measures can then be taken.

TIME OUT 4

Make a list of the other potential problems that can occur in surgical patients, along with any methods you are aware of for preventing or controlling them. Try to keep it general, rather than listing specific complications of particular procedures.



Other potential complications

The operating theatre is a high risk area and there are several aspects of the patient's visit which carry a potential for adverse events. It is part of the perioperative nurse's role to be aware of these potential complications and to be proactive in circumventing them.

Essential equipment The operating theatre is a critical care area, and complex circulatory and metabolic changes occur in the patient. A common procedure can change instantaneously into a critical event, and there is also a greater potential for cardiac and respiratory arrest. Emergency equipment and drugs are always available. Much of the equipment used, especially the anaesthetic machines that now incorporate all patient monitoring, is complex. The potential for equipment failure is always considered, and rigorous checks are conducted before every use. Oxygen is delivered through integrated pipelines, but there must always be an adequate number of full cylinders for use in the event of a failure. These also need to be checked at the start of each operating list.

Haemorrhage Another life-threatening complication is haemorrhage. This can range from acute bleeding during the operation, which is obviously dealt with immediately, to blood loss via a drain during the post-

operative recovery period. This means that perioperative nurses need to keep accurate records of intra-operative blood loss, and these records must be continued when the patient is transferred from the theatre unit.

Anaphylaxis Anaphylaxis is a potential hazard for all patients, but this is exacerbated during the perioperative phase, not only because of the invasive nature of surgery – many products contain latex, for example – but also because of the complex drug regimens which are administered. Perioperative nurses are vigilant in the early identification of adverse reactions through close observation, and information about any known allergies should always be communicated to the perioperative team.

Specific complications All nurses caring for surgical patients, at each point in the care episode, need to have some understanding of the types of surgery being performed and the specific complications that may arise. This can range from carbon dioxide retention after laparoscopy to internal tissue damage caused by instrumentation, which may not be immediately identified. Again, continual observation of vital signs and consciousness levels, combined with pain assessments, are obviously important.

Management of post-operative pain

A report from the Royal College of Surgeons and the College of Anaesthetists (1990) found that the treatment of post-operative pain had not advanced significantly since the 1950s. This deficit still exists today, and the primary responsibility for the existence of unnecessary post-operative pain is attributed to nursing and medical staff (Lander 1990). While freedom from pain is a basic human right, a more pragmatic approach can justify the benefits of good analgesia by emphasising the reduction of post-operative complications, which leads to fewer demands on ward nurses and earlier patient discharge.

Although assessment has been identified as an important aspect of successful pain management (Akinsanya 1985, McCaffery 1983), it has been suggested that nurses repeatedly tend to underestimate pain (Field 1996).

Audit of pain management In an attempt to find out how effectively we managed our patients' post-operative pain, we undertook an audit. The main aims were to identify:

- The current standards of pain management, and the methods and extent of information-giving.
- The level of patient expectations.
- The effectiveness of patient-controlled analgesia (PCA) systems.

We obtained information (case-note review and interview) about 69 patients who had had elective surgery (orthopaedic, general or gynaecological) and who were hospitalised for at least 36 hours post-operatively. Most of the interviews were carried out between 18 and 36 hours after surgery. Although patients did not express high expectations of the service, over 40 per cent had experienced more pain than anticipated. Although all these

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patients should have had their pain management discussed with them pre-operatively, only 52 per cent of them actually remembered this happening. This suggests either that information is not being given, or that the method of delivery is not always effective.

Nursing notes were reviewed for evidence of pain assessment taking place in the surgical ward post-operatively. There was a failure, in 87 per cent of case notes, to demonstrate evidence of accurate pain assessment. Statements such as 'analgesia given with effect' were not considered to measure the pain or the therapeutic effects of medication. Furthermore, pain scores on PCA charts were lower than patients' reports of pain at the time of interview. It appears, therefore, that nurses continue to underestimate the severity of post-operative pain.

While 88 per cent of patients reported experiencing pain at some point in the post-operative period, 20 per cent of these did not report it to a member of the ward team and 57 per cent waited to be asked about their pain before treatment was initiated. Of those who had PCA (24), only 50 per cent recalled any pre-operative explanation or discussion regarding this method of pain relief. Of these patients, 83 per cent reported pain scores indicating severe pain (or greater) on movement, and 20 per cent reported anxiety related to the use of the PCA. It seems that a complete explanation of PCA systems is best given pre-operatively in the surgical ward, rather than waiting until the patient is in the anaesthetic room as sometimes happens.

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TIME OUT 6



Reflect on the extended/expanded nursing role in theatres. You may like to compare your own clinical situation with that of the perioperative nurse and consider any contrasting professional and ethical implications. Do you think there is adequate education and training provision to cope with these changing demands?

Conclusion

Perioperative nursing contributions begin and end on the wards. All members of the perioperative team play an equal role in receiving patients on the ward and preparing them for the psychological and physical consequences of surgery. A very important liaison exists between the ward and the theatre reception. Communication is obviously critical and it is here that the medico-legal checks must be foolproof. Perioperative nurses are reliant on the information given by the escorting nurse. This communication continues within the multidisciplinary team and culminates with the comprehensive 'handover' given by the recovery nurse when the patient is transferred back to the general surgical ward. Good communication, at all stages of the patient's surgical experience, is essential to achieving a high standard of patient care ■

TIME OUT 5



In your experience, which methods of pain control may be most effective for post-operative patients? Do you agree that a nurse specialist in acute pain management should be involved in the care of all post-operative patients, or do you think this is best left to the individual ward nurses who will probably know the patient better?

Many patients have low expectations regarding their post-operative pain management – the majority expect pain and they experience it – and sometimes the information given to patients is inadequate or inappropriately delivered. Patients remain passive recipients, and the failure of many to report pain is indicative of this. More active patient involvement in treatment should be encouraged and may be effected through pre-operative education and preparation.

At the time of the audit, our unit was not one of the 57 per cent of hospitals which have the benefit of an acute pain team (Audit Commission 1997). However, we have been able to use these audit findings to demonstrate this deficiency and have now been successful in the establishment of this service. This will ensure that we can provide a better quality service for our patients.