



## Guest Editorial

### New systems for pre-operative preparation: challenges and opportunities for anaesthetists

Dr R Kerridge, Director, Perioperative Service, John Hunter Hospital, Newcastle, Australia

**A**naesthetists have long understood the importance of adequate assessment and preparation of patients before surgery.<sup>1</sup> This knowledge has been based on evidence from multiple studies of patient morbidity and mortality from around the world. Despite the evidence, adequate patient preparation is difficult to achieve, as the traditional system of patient management prior to elective surgery is unsatisfactory. The commencement of pre-operative patient assessment and preparation after admission is suboptimal. Crucial information that is needed for adequate pre-operative assessment and peri-operative management may include the results of tests (that are difficult to find) as well as the findings of history and physical examination. Explanation of procedures and risks shortly before operation may be harmful, is of dubious benefit, and is of doubtful legal validity. Alterations to the patient's health state may be difficult unless the operation is postponed.

These problems are systemic, rather than a result of lack of commitment or knowledge on the part of anaesthetists. There have been various attempts to establish pre-anaesthetic clinics to address these problems.<sup>2</sup> These have had limited success and have not become generally accepted as part of routine practice, but rather as a particular service for challenging patients.

The problem of suboptimal pre-operative patient preparation has other untoward effects beyond the direct clinical concern of anaesthetists. These include avoidable cancellations on day of surgery, 'no-shows', inefficiency of hospital processes, patient dissatisfaction, and resultant staff frustration or demoralisation. These 'non-clinical' adverse outcomes are of increasing concern to the managers of hospitals and health systems. As a result, both anaesthetists and hospital managers have a synergistic interest in improving patient preparation for surgery.

In recent years there has been a concerted drive designed to admit patients to hospital only a short time before their operation, even for major surgery. This change is driven by patient preference and financial pressures, and for patient safety. As a result, the traditional 'model' of pre-operative patient preparation, which has always been suboptimal, is now becoming completely unworkable.

In Britain, this has been recognised at a high level in the NHS, and has been a major focus of change by the NHS Modernisation Agency. The most common pattern has been to introduce nurse-based 'pre-op assessment', based on the traditional organisation of patient care within surgical 'firms'. The nurses involved in 'pre-op' have a varying degree of training, supervision and resource support. Clinics may be set up in or near established surgical wards, and conducted as part of the activity of the surgical 'firm'. Involvement of anaesthetists varies greatly between hospitals, and is evolving rapidly. The educational material developed under the auspices of the NHS Modernisation Agency to support this change is a notable innovation.<sup>3</sup>

The deployment of nursing staff into the area of pre-operative assessment is a major change, but can be thought of as workforce substitution rather than a fundamental change of process. The challenges of ensuring appropriate patient preparation in modern hospitals are so great that major systemic changes and 're-engineering' solutions are needed. Anaesthetists have a central role in the hospital management of surgical patients, a broad clinical perspective, and wide interspecialty and interdisciplinary interactions. They also tend to have a more 'team' style of working relationships than other medical specialists. They are thus ideally placed to develop the systemic solutions needed to improve the peri-operative management of patients having elective surgery.

#### Developments in Australia

Recent developments in Australia with regard to pre-operative preparation may provide a valuable model for anaesthetists' response to the challenge of improving pre-operative preparation in the modern hospital setting.

The Australian healthcare system has many similarities with that of Britain. Among these is the system of medical specialist training. Australian anaesthetists share the high standards of those in Britain, including having a broad general medical training. They are also closely involved in post-operative pain services and in intensive care. The sub-specialisation of physicians and surgeons is well advanced in both countries. Individual surgeons are becoming focused on a narrower range of specialised pathology and procedures. As a result, the need for a hospital-based

'generalist', able to deal with a broad range of patient issues both clinical and non-clinical, is becoming more apparent.

There are also important differences between the British and Australian healthcare systems. Australian organisational structures and funding systems are much more fragmented. Patients may attend multiple specialists and have procedures or investigations in a diverse range of settings, both public and private. Primary care practitioners and consulting specialists are less integrated with the health system than those in the British NHS. All these features exacerbate the challenges of global patient care, and particularly that of optimising pre-operative patient preparation.

In this setting, the 'Peri-operative System' was developed as a possible systemic solution to the challenge of improving the management of elective surgery patients. The System was developed by a multidisciplinary team of clinicians at Liverpool Hospital (Sydney) in 1992–1993.<sup>4</sup> It has since been disseminated nationally (assisted by a Government-funded change programme) and has now become the standard model of peri-operative care in Australia and New Zealand. Independently, hospitals in Canada and the USA have developed similar systems.<sup>5,6</sup>

### The perioperative system – concept and application

The concept of a peri-operative system is to plan all stages of care of an elective surgery patient as a unified and integrated process. The aim is both to improve the quality and to reduce the costs of care of elective surgery patients. Central to the peri-operative system is the development of a 'peri-operative service' as an administrative entity within the hospital. The peri-operative service provides pre-admission assessment and preparation of all elective surgical admissions. There is generally a central office, a clinic, a ward area, clerical support, a medical director and a nurse unit manager for the service.

The global nature of the peri-operative system needs to be emphasised. In the pre-operative phase, the key components include:

- a single entry system for all elective surgery patients (i.e. not a separate system for general surgery, ENT, ophthalmology, gynaecology etc)
- use of a patient-completed pre-operative patient health questionnaire as part of a graded system of patient assessment to replace the traditional admission, and to select patients requiring clinic assessment
- a system for gathering information about the patient from multiple sources (GPs, diagnostic services, consulting specialists, past treating hospitals) before clinic visits

- a multidisciplinary pre-operative clinic, staffed by specialist nurses, anaesthetists and other staff. This is not 'just' a pre-anaesthetic clinic. It is a peri-operative clinic, and includes assessment and preparation of all aspects of the patient's care
- a system to review the patient assessment including results of tests, and then co-ordinate patient preparation before admission. This includes communication with relevant units or services that will be treating the patient
- a specialised pre-operative preparation and holding area (a peri-operative unit) where all patients are admitted from home to hospital shortly before their procedure. Patients do not go to the surgical ward until after their operation
- a medical director to provide readily and immediately available senior medical (anaesthetic) support for the nurses and clerical staff involved in the Peri-operative Service.

Using the peri-operative system, almost all elective surgery patients (including abdominal, joint, vascular, cardiac and thoracic surgery) can be admitted to hospital through the peri-operative unit, 1–2 hours pre-operatively. Patient preparation has improved. Poor preparation, delays, cancellations, length of stay and costs per patient have been reduced, and patient satisfaction is increased. Adverse outcomes, including wound infections, are also reduced.<sup>7</sup>

The development of the peri-operative system has involved a shift in the content and style of work for many of those involved. Nurses have extended their role to become more actively engaged in patient assessment and high-level decision-making about patient preparation. Clerical staff have become closely involved in clinical processes, taking on a 'para-clinical' role. Most of the tasks of 'medical clerking', traditionally performed by junior medical staff, have been taken over by clerks, nurses and anaesthetists. The clinical role of anaesthetists has expanded to be centrally involved as the medical co-ordinator of pre-operative patient preparation, including a broader involvement in patient safety, quality of care, and efficiency. For anaesthetists, this represents an evolution of a clinical and managerial role out of the operating theatres to a role of 'peri-operative physician'.

### Controversies and special issues

There have been many important aspects, and controversial issues, associated with the development of this new system for the management of elective surgical patients.

The use of patient-completed questionnaires and selective clinics is the most visible feature of the system. Experience has shown that a questionnaire, reviewed by trained clerical or nursing staff, with readily available medical support, can act as an effective and safe screening system to select patients for clinic review. Selectivity of attendance at the peri-operative clinic varies depending on hospital casemix and patient population. In general, approximately 15% of day-only patients and 40% of day of surgery admission patients need clinic-based assessment. Some clinic patients can be adequately prepared by nurses or 'junior' medical staff alone, but readily and immediately available anaesthetic (peri-operative physician) consultation is crucial to support this process. Non-clinic patients can be appropriately prepared by questionnaire and telephone consultation. Neither patients nor staff should waste time in unnecessary clinic consultations.

While the clinic is the most visible component of the system, the service activity both before and after the clinic is of equal if not greater importance. The gathering of patient information from a wide variety of sources, such as other hospitals, consulting specialists and general practitioners, is crucial. After the clinic, the challenges of co-ordinating patient preparation, including complex issues such as diabetes, debarfarinisation or dialysis, require high-level teamwork and communication. This work is best performed by trained, experienced and energetic nurses, but ongoing senior medical involvement by an anaesthetist (as peri-operative physician) is crucial to support this process. The importance of this office-based role of the peri-operative service tends to be overlooked by hospital administrators and other clinicians. It is crucial to the high-level function of the service to enable safe preparation of difficult patients. It requires adequate support, including staff time, office accommodation and other resources.

The role of 'peri-operative physician' represents an expanded role for anaesthetists. Some of this role was previously performed (usually suboptimally) by the surgical houseman. Anaesthetists have the necessary skills and training to take over this role directly or in a supervisory capacity. Some anaesthetists are reluctant to take over the 'houseman's job', or move from their 'comfort zone' in the operating theatre. This attitude may be short-sighted. If anaesthetists are perceived as technical staff in theatres ('bag-squeezers') rather than broadly skilled doctors, their status and security in the future may be threatened. Taking on the peri-operative role may increase the status of the specialty – this appears to have happened in Australia.

The various functions of the peri-operative service include 'traditional' clerical and organisational tasks, and 'para-clinical' tasks that can be efficiently performed by clerical staff under clinical supervision. Administrators often overlook the need for clerical support. Clinicians of all disciplines tend to be clerically inefficient and unskilled, and hence the need for clerical staff must not be underestimated.

It is logistically impossible for each anaesthetist personally to assess his or her patients in the clinic. The medico-legal responsibility of the anaesthetist caring for the patient at the time of the operation does not change. Explanation of procedures for consent purposes is probably of dubious legal standing when performed shortly before the operation. This does not prevent the anaesthetist using and relying on others to perform some tasks in the process of pre-operative preparation of the patient. We currently depend on patients to give true answers to questions and follow instructions. We depend on ward nurses to fast the patient, give normal medication, and give premeds. We must develop a system that we can depend on, and trust, to appropriately assess and prepare patients prior to admission. This can be assisted by the development of standardised documentation systems, agreed clinical guidelines and protocols, but most importantly requires teamwork based on mutual professional respect and trust. Anaesthetists are more team orientated than most medical specialists, but for some anaesthetists this is personally challenging.

As noted above, patients are admitted directly from home to an area adjacent to the operating theatres (the peri-operative unit) shortly before their operation. Patients do not enter the surgical ward until after surgery. This has a number of clinical and non-clinical advantages. Surgical ward beds are better utilised, since they are not required until the post-operative phase. The efficiency and quality of patient preparation shortly before surgery are improved, since a small group of specialised nurses are able to focus on these without the clinical distractions seen on a surgical ward. Communication and co-ordination with operating theatres are improved, and delays reduced. The introduction of incremental process improvements and new clinical practices is facilitated by the concentration of patients in one area. To function effectively at a high level, the nurses in the peri-operative unit need to know that they can pick up the phone and rapidly have a response from a senior member of the anaesthetic staff.

The development of a central pre-operative area (which may also hold pre-and post-operative day-only patients) has

been a central aspect of the development of the Peri-operative System, and is a component with great advantage for reduction of length of stay and cost savings. It is surprising that the idea appears not to have become more widespread in Britain.

Implementation of a peri-operative system requires a multidisciplinary team approach, with time, energy and goodwill to deal with the multiple 'minor' problems encountered. The keys to implementation of the change are: shared enthusiasm, respect and vision amongst all groups involved; tolerance of the many 'teething troubles' encountered; frequent meetings of a working party to supervise change; and continuous communication as required. Medical leadership is needed, emphasising the importance of this new role for anaesthetists.

### **Peri-operative medicine**

The advent of the peri-operative system has meant that systematic patient preparation one week or more pre-operatively is becoming normal. This provides an opportunity to improve patient outcome by a variety of specific interventions, pertaining to the peri-operative period, to improve patient preparation and convalescence. These interventions have previously been not known about, not logistically feasible, or simply not attempted. This represents a developing body of knowledge and interventions that can be described as 'peri-operative medicine'.

Peri-operative medicine may include the development and evaluation of new techniques and technologies for pre-operative assessment. For example, CardioPulmonary Exercise Testing (CPX) may provide an objective assessment of physiological reserve and predict survival after major surgery.<sup>8</sup>

The use of specific peri-operative pharmacotherapy to improve patient outcome is a broad field for development. The appropriate management of chronic drug therapy, such as antiplatelet agents, needs more research. The current interest in peri-operative beta-blockade<sup>9</sup> provides a template for further research in other pharmacological interventions, including immunonutrition.<sup>10</sup>

Pre-operative interventions to improve patient health, such as psychological preparation, weight loss, smoking cessation and exercise therapy, seem appropriate but must move from 'enthusiastic amateurism' to the use of scientifically validated methodology. We have recently completed a randomised controlled trial demonstrating the effectiveness of a multi-component smoking cessation intervention, including extended smoking cessation up to three months post-operatively.<sup>11</sup>

Peri-operative interventions related to blood transfusion, such as autologous or directed donations, and iron or erythropoietin therapy, are appropriately undertaken by the peri-operative service.

Apart from these patient-focused issues, the development of the peri-operative system provides an avenue for involvement in broader health system research and development. Among these are the clinically-focused development and use of better communication systems, such as the electronic patient record.

Ideally, the pre-operative period represents the commencement of a planned and structured multidisciplinary process of care extending into the convalescent phase.<sup>12</sup> There are clearly a wide scope and need for involvement of anaesthetists – as peri-operative physicians – in this exciting field.

### **The future for anaesthetists**

Changes in the management of elective surgery are presenting new challenges for anaesthetists. Meeting these challenges will require changes in the way we perform our work. There was a time when anaesthetists worked as individual practitioners, and focused their clinical skills in the operating theatre. We have now developed our specialty so that some patients are looked after by one anaesthetist during induction, another during cardiac bypass, another in the ICU, and another when under the care of the acute pain service. Our involvement is now being extended into the pre-hospital phase, where a structured, teamwork approach is also needed. Some anaesthetists will develop a special interest in the 'new' sub-specialty of 'peri-operative medicine'.

For most anaesthetists, the changes in the system of patient care before elective surgery can result in one of two outcomes. In those hospitals that develop a system with strong anaesthetic involvement, the preparation of patients for surgery will be optimal, use of hospital resources will be efficient, and the anaesthetists shall be respected and (hopefully) satisfied in their work. In other hospitals, patients will continue to be admitted inappropriately prepared, inefficiency will reign, and anaesthetists will be regarded as grumpy, frustrated technical staff who are overpaid and underworked.

The peri-operative system is a patient management system that improves the quality of care, while reducing costs. Anaesthetists have a crucial role in the success of the system. Anaesthetists who take up this challenge are ensuring a better future for themselves, their specialty and, most importantly, their patients.

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