Perioperative medicine from the perspective of a geriatrician

The need for perioperative physicians has featured in recent scientific and policy-related literature. This has been prompted both by the increasing complexity of the surgical population and by the mounting evidence of avoidable adverse postoperative outcomes.

Compared to twenty years ago, the population now undergoing surgery is more complex; they are older, have more multimorbidity and are frailer. Each of these factors is known to be an independent predictor of adverse postoperative outcome. The high-risk population, as defined by these predictors, constitutes 10% of total surgical population. However, it accounts for 80% of deaths within 30 days of surgery. In addition this population has high rates of in-hospital morbidity, and is likely to suffer prolonged functional impairment with increased postoperative need for formal and informal care. Unsurprisingly, these patients have long lengths of hospital stay, high rates of readmissions and are likely to incur higher costs in hospital and in the community. From research and national reports it is clear that the current provision of perioperative care is not addressing the needs of this complex group. Such findings point specifically to the deficiency in medical care provided to surgical patients, preoperatively as well as postoperatively. It is important, however, to note that high-risk patients constitute only a small proportion of the total surgical population. Therefore pathways of care must simultaneously address the needs of the majority of patients who are low risk, and ensure quality, patient-centred care for the minority who are high-risk. The development of services targeted at the high-risk subpopulation requires: a) critical review of the traditional model of surgical care; b) consideration of design, implementation and evaluation of responsive models of care and c) provision of necessary education and training to ensure a competent workforce.

This article provides an initial exploration of these issues and describes one approach to the challenges in more detail.

Review of the traditional pathway of surgical care

Traditionally, the surgeon is the clinical lead throughout the surgical pathway, with the anaesthetist providing support at preoperative assessment and hands-on intraoperative anaesthetic management. In this traditional model, it is unusual for anaesthetists to be involved in medical care following discharge from theatre, recovery, high dependency or intensive care units to the surgical ward.

Preoperatively, the majority of elective surgical patients undergo nurse-delivered pre-assessment, where a protocolised appraisal of anaesthetic and medical issues is conducted to assess ‘fitness’. Concerns are discussed with an anaesthetist or result in referrals to primary care or organ-specific specialities. In many cases primary care practitioners or even organ specialists who receive these referrals are not aware of the emerging evidence base for preoperative risk assessment and optimisation. There are several potential drawbacks to this approach. First, it may fail to recognise previously undiagnosed disease or syndromes (such as COPD, or cognitive impairment). Second, it may cause delays in surgical treatment as a consequence of waiting for anaesthetic or specialist review. Third, it may result in missed opportunities for optimisation, or a label of the patient being ‘medically unfit’ precluding future surgical intervention. Furthermore, poor identification of high-risk patients may result in inappropriate postoperative placement of the patient on a ward rather than on a high dependency or intensive care unit. It is clear that whilst this preoperative assessment model is comparatively cheap and effective for uncomplicated patients, it may be less well suited to high risk patients.

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Postoperatively, patients who are identified as high risk, or those who have undergone high risk surgery, are admitted to high dependency or intensive care. However the majority of patients return to surgical wards, where junior surgical doctors deliver day-to-day care of patients, with routine anaesthetic support typically withdrawn within 24 hours of surgery. Postoperative medical and functional issues in surgical patients are most often managed reactively as problems emerge. Crisis referrals are made to organ-specific specialties or the on-call medical registrar or internist, resulting in lack of continuity. Such an approach fails to provide timely, proactive and comprehensive medical care to complex surgical inpatients, and may not address the common non-emergency complications such as postoperative cognitive disorders or failure to rehabilitate.

**Design and implementation of patient-centred models of care**

In contrast to traditional models of care, gold standard perioperative services ensure targeted preoperative assessment and optimisation, preoperative shared decision making, patient-specific intraoperative care, and tailored postoperative medical management, rehabilitation and proactive discharge planning. Such services require effective differentiation between high – and low-risk patients, followed by individually tailored care specific to the needs of the patient. The design of these services is driven by the specifics of the local population, the available resources and by the background of the clinician, all of which result in implementation of different models of care. However all of these models of care have underpinning principles in common: the use of evidence-based tools to assess and optimise the patient across a range of pathophysiology; clear and honest communication with the patient, carer and health care professionals to ensure shared decision making, and the provision of appropriate transition of care from theatre to high-dependency or intensive or ward-based care, with the right expertise at the right time. Some of these models follow the patient through to discharge to the community. Many of these very successful high risk pre-assessment models of care are anaesthetist led and delivered. Other innovative pathways have also been established. One such example is the Proactive care of Older People undergoing Surgery (POPS) service at Guy’s and St Thomas’ in London.

**The Proactive Care of Older People Undergoing Surgery service**

The POPS service was established in response to locally and nationally observed high rates of late cancellation of surgery for medical reasons, of postoperative medical complications on surgical wards, and of poor rehabilitation and discharge planning in older elective surgical patients. These issues frequently prompted a geriatrician review. Often this was at a late stage during the surgical pathway, for example, a number of weeks postoperatively. By this time the patient might have had multiple medical complications (e.g. acute kidney injury, acute pulmonary oedema and/or delirium), failure to rehabilitate and a protracted length of stay. In response to these issues, the team used the MRCP framework for complex interventions to design, embed, and evaluate a comprehensive geriatric assessment service for older elective surgical patients. The POPS team is geriatrician-led and multidisciplinary (doctors, nurses, therapists and social worker) who provide preoperative assessment and optimisation, shared decision making, and postoperative medical management, as well as goal setting, rehabilitation and discharge planning. The team works in close collaboration with anaesthetic and surgical colleagues, seeking advice from organ specialists as necessary. Patients are referred to the POPS team on the basis of multimorbidity (more than three co-existing conditions), geriatric syndromes (frailty, cognitive impairment, poor functional status) or when there is uncertainty about the risk-benefit ratio of surgery. Referrals are received from surgical teams, pre-assessment nurses and from primary care. The POPS service sees 1,000 elective surgical patients per year (and runs a concomitant service for emergency surgical patients).

POPS preoperative assessment and optimisation is undertaken in a one-stop clinic using a process termed Comprehensive Geriatric Assessment (CGA). CGA has an established evidence base in medical and community settings and a developing evidence base in perioperative medicine. It is a process which facilitates an objective, holistic, interdisciplinary assessment, allows the formulation of a list of needs and issues, and results in the development of an individualised care and support plan. This plan can be used to inform the whole of the surgical pathway.

The assessment component provides recognition and assessment of the severity of previously diagnosed as well as undiagnosed conditions (poor cardiorespiratory status, co-morbidities and geriatric syndromes).

The intervention component includes preoperative medical, social, functional and psychological interventions to ensure the patient is as ‘fit as possible for surgery’ using evidence-based guidelines (for example, medical optimisation of heart failure and anaemia, exercise therapy to improve cardiorespiratory function, counselling to address anxiety on a diagnosis of cancer). As optimisation of multimorbidity and geriatric syndromes can be complex and time-costly, knowledge and skills in general, organ-specific and geriatric medicine are essential.

The planning component includes shared decision making with the patient, carers and healthcare professionals. This involves discussion of potential benefit and harm of surgery, prognosis with and without surgery, comparison with other treatment options, and advance care planning both in the case of surgery proceeding and not proceeding. It also
includes planning of intraoperative care (surgical and anaesthetic technique) and the setting for immediate postoperative care (level 2 or 3 care or surgical ward). Furthermore, there is planning for the management of predictable but not entirely preventable postoperative complications. For example, in patients with atrial fibrillation proactive advice is given to the ward team on the drug of choice if the patient develops uncontrolled rate; or surgical ward nursing staff are alerted to patients at high risk of delirium and advised on use of evidence-based interventions to reduce the incidence, severity and duration of delirium.

The postoperative component of the service aims to standardise medical management of postoperative medical complications, ensure safety and quality, provide focussed goal-setting, rehabilitation and discharge planning. This is delivered through regular geriatrician ward reviews, joint consultant surgeon and geriatrician ward rounds, and surgical ward-based multidisciplinary team meetings. Many of the patients require ongoing rehabilitation or engagement with community services (both health and social care). For these patients the POPS team liaises closely with community services to both ensure safe and effective discharge planning and facilitate appropriate follow up.

The service has evolved over the past ten years to cover almost all surgical subspecialties at Guy's and St Thomas' Hospital. This expansion has been supported by data from a pre and post study in orthopaedic surgery, which demonstrated reductions in postoperative medical and multidisciplinary complications and length of stay in the intervention group. A number of local quality improvement programmes delivered by POPS have shown improvements in quality of care and allowed securing of mainstream funding for the team, recent expansion and the transfer of foundation programme doctors to the team. A randomised controlled trial comparing POPS preoperative assessment and optimisation to routine pre-assessment in elective vascular surgery patients will be reporting in the near future. The service is being replicated in other hospitals but has not yet been adopted on a national scale, the possible reasons for which are discussed in a recent national survey.

**Education and training for perioperative physicians**

It is clear that if perioperative physicians are to address the needs of the high risk surgical patient throughout the surgical pathway, a new education and training programme is necessary to ensure appropriate skills and competencies. Traditional education and training needs to be broadened to include an understanding of common undiagnosed conditions (organ specific disease and geriatric syndromes) and the impact of these on postoperative outcomes. There needs to be a move away from identification of ‘problems’ and onward referral to primary practice or to organ specialists, to the delivery of ‘hands-on’ optimisation. Perioperative physicians need expertise in the use, interpretation and communication of risk assessment tools and scores and their use in shared decision making. Specialised skills are necessary to communicate with the increasing number of patients with cognitive impairment. Such skills are also required for those difficult circumstances where surgery is not appropriate but where the focus should be on advance care planning. For example if a patient is identified as being too high risk for elective aneurysm repair, then advance care planning may be required for palliative management of a potential emergency rupture. If perioperative physicians are to provide or coordinate postoperative medical care, not only in level 2 and 3 settings but also on the wards, then up to date training in common postoperative medical complications as well as rehabilitation medicine may be necessary. Of course it may be that not all aspects of care should be delivered by the same individual. Instead teams of professionals who are expert in different stages of the surgical pathway may need to work together to ensure a patient-centred approach. In this respect the variety and breadth of educational resources for perioperative medicine should be valued and utilised.

**Conclusions**

There is evidence that the traditional pathway of surgical care requires modification in the light of demographic changes, advances in surgical and anaesthetic techniques and societal expectations. This evidence has clearly identified the need to recognise and develop the field of perioperative medicine. Although the delivery of perioperative medicine should be underpinned by a set of shared principles, in practice there are many approaches to its clinical implementation. However, it is also apparent that there is a need for closer collaboration between surgeons, anaesthetists and physicians to ensure safe quality care, to achieve good clinician and patient reported outcomes and to provide the necessary education and training.