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Perioperative medicine, interventions in surgical care: the role of replacing the late-night review with daytime leadership

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ABSTRACT

As the ambitions of surgery have continued to develop, it has resulted in medical advancements that challenge the current paradigms of hospital medicine. Patients previously deemed unsuitable for surgery are now undergoing potentially lifesaving treatments, but are nonetheless still being managed within a model of care that fails to meet their individual needs. Termed 'high risk', these patients, who are frequently elderly or with multiple comorbidities, embark on a surgical journey that is often fragmented and disjointed. Such patients contribute a startlingly high mortality and morbidity rate for non-cardiac elective surgery during the perioperative period, and as a result provide an added demand on already strained hospital resources. 'Perioperative medicine' has been proposed as a possible solution to this problem as it attempts to create a bespoke patient-centric model of care from the moment the need for surgery is identified, through to patient recovery. It is envisaged that the role of a perioperative physician would be to oversee this journey, uniting varying specialties along the way to ensure the best possible patient outcomes.

KEYWORDS: High-risk surgery, high-risk patient, perioperative medicine and perioperative physician

Introduction

A new word has recently appeared in the medical lexicon – 'perioperative medicine' – a term that describes the medical care of patients from the time of contemplation of surgery, through the operative period to recovery, thereby excluding the operation or procedure. Those practising perioperative medicine aim to identify patients at high risk of death or significant morbidity in these periods, and to work collaboratively to optimise their care rather than 'rescue' them from complications. It is envisaged that professionals with expertise in medicine and anaesthesia, as well as surgery, have complementary expertise and can together deliver care that reduces morbidity, mortality, workload and ultimately healthcare costs.

Why do we need a change?

Of the 10 million surgical operations that are undertaken in the UK every year, 1 million are considered to be major in nature, ie operations that are either expected to be prolonged in duration or major orthopaedic, thoracic or abdominal surgery. Hospital surgical mortality varies between countries and in the UK has been estimated to be as high as 3.6%, compared to a mortality of 1.8% seen in Sweden and other Scandinavian countries as identified by the European Surgical Outcomes Study (EuSOS).[1] A well-defined sub-population, which may be termed high-risk, accounts for a disproportionate number of deaths and morbidities. This high-risk group can be defined as those patients of advanced age, with comorbid disease or undergoing a major procedure;[2] although this definition is somewhat simplistic, and can be refined with the use of advanced preoperative stratification, such as measurement of the anaerobic threshold. The elderly and infirm that undergo major surgical interventions dominate this population, and represent a cohort that continues to grow. Thus, the number of UK residents over the age of 100 years has risen by 70% in the last 10 years, and the over 65-year-old population is projected to increase by 23.6% between 2011 and 2021.[3] In 2012, a cross-sectional study in Aberdeen identified that 42.2% of all patients registered with general practitioners (irrespective of age) had one major morbidity, and 23.2% of this group had multiple comorbidities.[4] In populations, death rates associated with surgical interventions remain high. In 2013, the average 30-day mortality following hip fracture surgery was 8.02%,[5] and for emergency laparotomy 14.9%, a figure rising to 24.4% for those aged over 80.[6]

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While hospital death rates vary widely, patient complication rates between institutions appear to be consistent. In 2012, a 20% postoperative complication rate was reported between US hospitals, but mortality rates varied between 3.5 and 6.9%.[7] The differentiating factor between hospitals was not their complication rate but variation in their ability to effect 'rescue' once these had occurred. In an earlier study the profound long-term effects of surgical complications on survival were evaluated, and a significant and sustained mortality burden was demonstrated in patients suffering even seemingly minor complications.[8] These effects were shown to persist for up to 5 years after the initial insult.

Historically our ability to identify this high-risk patient population and allocate clinical support services proactively has been limited. The 2011 National Confidential Enquiry into Patient Outcome and Death[9] Report identified a systematic failure in the process of defining this population and the appropriate allocation of critical care resources. The observational study EuSOS,[1] which analysed perioperative data across Europe, also discovered a low rate of elective critical care use among high-risk patients and demonstrated that 73% of those patients who died during the study received no critical care support. This may in part reflect the availability of intensive care unit beds, a problem that appears to become increasingly critical year-on-year and afflicts even well-funded healthcare systems.[10]

Preoperative assessment is symptomatic of the fragmented surgical pathway. A patient is seen by a surgeon with a decision to operate being taken in isolation before an opportunity to evaluate non-surgical elements of risk. In the highest risk population, a number of independent clinical teams play 'catch up', attempting formal assessment, clinical optimisation and discussions concerning management, against the backdrop of a ticking clock defined by evolving pathology, a date in the diary, or an imposed statutory deadline. Each is considered a significant barrier to doing what might be right or at least better for the patient.

Ten years ago the Improving Surgical Outcomes Group, a collaborative endeavor developed by those involved in operative management (including anaesthetists, surgeons and critical care teams in the UK), proposed actions to improve care for surgical patients.[11] Such improvements included calling for new standards to impose better triage and resource allocation, and an end to siloed teamworking and budgeting. Pre-operative assessment was considered central to assessing fitness and developing strategy for the multidisciplinary team engagement. Since that time, high-quality data have supported a need for change.[8,12]

A change to what?

An opportunity to manage the 'mismatch' between societal expectations and the ability to affect surgical cure must be considered an early goal of pathway redesign. Stronger emphasis on patient assessment and risk stratification lends itself to a better-informed episode of care, with the sharing of often complex decisions bringing clarity to the expectations of the patient, their family and even healthcare professionals. The limitations of 30-day mortality measures must give way to metrics considered important to patients and healthcare funders. Patient-reported outcome measures and experiences must play a prominent part in understanding what success might look like in any new pathway.

The early identification of what may be a limited (often occult) physiological reserve in those patients destined to struggle to keep pace with highly protocolised surgical pathways will be important.[13] Shaping multidisciplinary optimisation and monitoring may ultimately rescue their failing physiology. For example, the introduction of pre-operative cardio-pulmonary exercise testing (CPET) as an adjunct to risk stratification in patients undergoing elective surgery for abdominal aortic aneurysm patients has demonstrated improved perioperative outcomes.[14] CPET has also been shown to identify patients unlikely to survive in the mid-term, even after successful abdominal aortic aneurysm repair.[15] Central to this process of exposing limitations in functional reserve is the desire to replace the late-night emergency medical opinion of the failing surgical patient, with the well-informed daytime senior review.

In recent times, large, well-constructed trials of specific clinical interventions have called into question traditional pathophysiological paradigms in surgical patients and their applicability during the perioperative period. For example, the Perioperative Ischaemic Evaluation Trial, which focused on the use of beta blockers during the perioperative period to help modulate cardiac function,[16] has resulted in a change in the way that we currently utilise perioperative beta blockade. This high-quality randomised controlled trial has allowed us to limit beta blocker therapy to patients with a pre-existing clinical need or those established on long-term therapy, and no longer for all high-risk patients. Such studies make it clear that new learning will be required by all of those charged with improving outcomes, not only for our therapeutic interventions, but also in non-traditional skill sets. Improvement science, human factors, patient safety and leadership must feature highly if a future hospital is to deliver change in line with the vision of healthcare improvers, including Robert Francis.[17] Any new model must offer the opportunity to measure, analyse and refine the perioperative model of care. As the international businessman James Harrington has observed:

> *Measurement is the first step that leads to control and eventually improvement. If you can't measure something, you can't understand it. If you can't understand something you can't control it. If you can't control it, you can't improve it*

The surgical pre-assessment clinic (PAC) is where this process should begin. A survival benefit has been demonstrated from PAC intervention, yet the same national audit highlighted 20% of high-risk patients underwent surgery without prior PAC attendance.[18] Improvements are afoot, and a survey from 2014 showed that a consultant anaesthetist staffed 80% of PACs, reflecting the professions' determination to make this clinical episode count. As surgical patients become older, more complex and undergo increasingly invasive surgical procedures, the requirement for advanced multidisciplinary PACs is becoming a reality. Examples exist in the UK and may represent the natural evolution and growth of the consultant anaesthetist-led PAC. The Proactive Care of Older People Undergoing Surgery (POPS) service is a geriatrician-led intervention that has improved outcomes for the older surgical patient.[19] By embedding a

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multidisciplinary team approach within the perioperative pathway, POPS teams demonstrably reduce the incidence of medical complications in the perioperative period.

Traditionally we have considered the fiscal restraints imposed on healthcare spending to limit our ability to improve patient outcomes. As healthcare spending as a percentage of UK GDP continues to fall, improvements in surgical services and technique are considered important developments in reducing mortality, morbidity and the length of hospital stay. Such advances include best evidence-based enhanced recovery pathways, minimal access and robotic surgery, all of which seek to limit tissue trauma, immuno-inflammatory responses and consequently minimise surgical insult. When bound together as a recognised bundle of care, real cost savings have been achieved and should be a credible focus for improvement.[20] For example, when implemented correctly the enhanced recovery programme (ERP) not only improves patient outcome but also promotes early discharge – thereby improving hospital efficiency. This is achieved by focusing on key targets within the patient's perioperative journey, and developing a structured approach to aspects such as nutrition, analgesia and early mobilisation. ERP involves perioperative planning with both the patient and their relatives thereby leading to improved patient understanding and satisfaction.

The future of perioperative care

In January 2015, the Royal College of Anaesthetists (RCoA) published a perioperative medicine discussion document entitled *Perioperative Medicine – the pathway to better surgical care*.[21] Its intention was to help redefine and develop the future delivery of perioperative care and to 'provide a solution(s) to the unmet need, using existing skills and expertise within the NHS to reduce variation and improve patient outcomes after surgery'.

The model proposed leans heavily towards the use of protocols to reduce variance and to highlight outlying care, taking active learning from the pockets of excellence that clearly exist within the NHS. The ability to individualise care, based on risk profiling and better use of clinical investigations, has also been emphasised. There must be a willingness to work more closely (and earlier) with primary care to allow for a seamless transition of patient management, which avoids duplication of often redundant investigations and unacceptable delays in definitive surgery. Furthermore, there must be a willingness and a mechanism by which early patient assessment allows access to specialist medical teams, which rather than being seen as potentially delaying surgery, will instead bring added value in a timely fashion to patient care.

It has been proposed that the perioperative process should be overseen and orchestrated by an individual or group who are trained in the fundamentals and science of perioperative medicine, thereby bringing best clinical practice to the bedside. Although anaesthetists are traditionally well placed to adopt this role, in practice the role of the 'perioperative physician' can (and should) come from any medical background, provided they have been suitably trained to adopt this evolving and demanding role. A new model for care will demand a new syllabus and curriculum to support it. The design should be fresh and challenging, but should resist the temptation to replace the tried and tested with the unworkable and unproven. The reactive 'one-size-fits-all' model however must give way to a continuum of proactive care, orchestrated by a team with a leader and supported by a multidisciplinary team of experts, bringing coordinated and timely experience and clarity in communication.

The RCoA report should be seen as an opportunity for medical teams to come together and decide, develop and deliver improved pathways of care. Within the UK and worldwide there is a growing cohort of multimorbid, often frail and elderly patients who disproportionally suffer predictable complications and poor outcomes as a consequence of seeking surgical cure. The future hospital must therefore embrace the aspiration of improved health delivered by a better healthcare system, all the while costing less. The perioperative medicine model is patient-centred, physician-led and multidisciplinary with continuous measurement and improvement at its heart. ■

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