



The impact of complications and errors on surgeons

Do surgeons need support – and, if so, what kind?

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All surgical procedures carry the potential for adverse events. Dealing with the sequelae of the complications and errors that arise in the course of normal practice is therefore part and parcel of a surgeon's working life. The challenges and stresses that this creates are now well recognised, although surgical training has, until recently, done little to help surgeons prepare for such events, and ongoing professional and personal support is limited.

Two recent books, Atul Gawande's *Complications*¹ and Henry Marsh's *Do No Harm*,² have highlighted with searing honesty the difficulties that surgeons face when compli-

cations and errors occur during surgery. Wu *et al* have drawn attention to the fact that although it is crucial to focus on the needs of patients and their families when errors occur, it is also important to recognise that surgeons may be the 'second victims' in such circumstances.^{3,4} This is not least because they must respond to the challenge of providing effective patient care and may also need to deal with the reactions of the patient's family, with the judgements of colleagues and, in some cases, with disciplinary or legal proceedings. Although there are often standard protocols in place regarding how to manage patients and families, it is far less clear how, and to

what extent, surgeons need support.^{5,6} This paper examines the evidence on the nature of the impact that adverse events have on the professional and personal lives of surgeons, whether there may be differences in that impact for complications versus errors and the nature of the support that surgeons might require as a result.

It is clear that surgeons live pressured lives and that this, in and of itself, can adversely affect surgeons' wellbeing. In a large study, Shanafelt *et al* surveyed 7,905 members of the American College of Surgeons about their professional practice, quality of life and career satisfaction, as well as depression and burnout.⁷ Given that surgeons in the sample typically worked 60 hours per week and were on call 2 nights a week, it is perhaps not surprising that 40% of respondents were burned out, 30% screened positive for symptoms of depression, and quality of life was well below the population norm. Importantly, this pressure may lead to mistakes being made. In one study, depressed residents made more than six times as many medication errors as those who were not depressed,⁸ whereas in another the number of errors reported correlated with depression, burnout, lower quality of life and emotional exhaustion.⁹

SURGEONS AS SECOND VICTIMS

A recent major review of the burgeoning literature on this subject suggests that the impact of errors may be considerable.⁴ It was found that the prevalence of second victims after adverse events varied from 10% to more than 40%, depending on the study. 'Victims' reported strong negative reactions such as anger and irritation, sadness and depression, and shame and self-blame.

What is unclear from this review is the extent to which the studies included might reflect the reactions of surgeons specifically to such events, not least because the studies encompassed all medical professions.⁴ In addition, the terms on which searches were made of research databases were biased towards a negative response (eg 'medical error', 'burnout', 'depression', 'empathy'). Of

the 32 studies included, the majority were from relatively small samples and 15 studies used qualitative rather than quantitative methodologies. Finally, the definition of a 'second victim' is imprecise and based on the assumption that individuals have made a major error for which they feel personally responsible. The perspective presented in this review may therefore reflect some but not all surgical experiences.

SURGEONS AS RESILIENT INDIVIDUALS

Recent research suggests that, as a group, surgeons may have some degree of stress immunity. A study examining personality differences between specialties found that surgeons scored more highly on a tough-mindedness scale than family practice physicians and anaesthetists, indicating

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that they were less likely to be distracted by emotions when problem-solving.¹⁰ Similarly, Pegrum and Pearce examined the personality traits of 172 consultants using the Psychopathic Personality Inventory, and compared their scores with those of the general population.¹¹ They found that inventory scores in the sample were significantly higher than the population norm, with particularly high scores on stress immunity. Surgeons were among the highest-scoring individuals in the sample. The authors concluded that the 'prevalence of stress immunity as the overriding personality trait in consultants may better facilitate patient care'.

Regardless of whether such a conclusion is warranted on the basis of these data, the study by Pegrum and Pearce implies that surgeons may have personality traits that enable them to deal with the stressors placed on them.¹¹ Such a positive perspective is missing in the 'second victim' literature and suggests that a more balanced approach is warranted in which individual differences in resilience are examined. Indeed, recent research indicates that there is considerable variation in both the nature and extent of surgeons' reactions to adverse events, with some being much more affected than others.¹²

In addition to personal resilience, effective coping strategies are another part of the armoury that surgeons have to enable them to deal effectively with adverse events. Both surgeons¹² and other healthcare providers^{13,14} report using a variety of coping strategies; these may be problem-focused (directed towards changing the relationship between the demands of the situation and the resources available) or emotion-focused (directed towards managing the emotional consequences of the stressor). The problem-focused coping strategies that were most commonly reported by surgeons were discussing the complications with peers for advice, deconstructing the complication to identify lessons that could be learnt and ensuring skills are up to scratch.¹² Common emotion-focused strategies included rationalising by putting what happened into perspective, talking openly to patients as a way of finding closure, and seeking reassurance from colleagues.

ADVERSE EVENTS: ERRORS, COMPLICATIONS AND SYSTEMS

Surgeons' responses also appear to depend on the nature of the adverse event. For example, the severity of the outcome and the reactions of the patient or his or her family are commonly reported determinants of a surgeon's reaction.^{12,15} Despite obvious variation in the severity and nature of adverse events, the overwhelming majority of research has treated errors in an undifferentiated way. It has



Detail from *Prevision*, 1948, from 'The Hospital Drawings' series by Dame Barbara Hepworth



The Scalpel 2, 1949, from 'The Hospital Drawings' series by Dame Barbara Hepworth

also focused on errors rather than complications. This is not helped by the fact that errors and complications are not easy to define, and are often conflated in the literature.

Previous major studies examining errors have used definitions referring to preventable adverse events¹⁵⁻¹⁷ that arise when care falls short of the standard expected.^{16,18} Errors might therefore be defined as *avoidable commissions or omissions* with potentially negative consequences. They would have been judged as poor practice by skilled and knowledgeable peers at the time when they occurred, independently of whether there were any negative consequences. Complications, by contrast, are adverse events that are *an acknowledged risk of surgical care* (ie when a standard medical procedure is undertaken, there are risks that are not avoidable).^{19,20}

Despite the fact that complications occur much more frequently and are an inevitable part of dealing with the risks inherent in surgical procedures, very little is known about their impact on surgeons. In a recent UK study, Pinto *et al* interviewed 27 surgeons about the personal impact of both complications and errors.¹² While it was suggested that errors may have more negative consequences on surgeons' emotional adjustment than complications, no distinction was made between the two types of adverse effects during data collection. (Surgeons were 'asked to discuss complications without an assump-

tion that these were caused by medical error' but it is clear from the text that 'complications' was an umbrella term that included preventable errors.) As a result, this assertion is difficult to sustain, particularly given the small size of their sample.

Although self-blame is understandably common when errors occur (with the majority of respondents attributing errors to an 'individual-level factor' rather than to a 'system issue'),^{4,9} there is a growing

Errors may have more negative consequences on surgeons' emotional adjustment than complications

literature highlighting the role that systemic and organisational factors play in creating opportunities for error.²¹⁻²³ The systemic approach assumes that error is inevitable but can be reduced and ameliorated through appropriate management.

One example of this is the development of the surgical safety checklist,²⁴ a simple device that helps to enhance performance by

compensating for the potential limits of human memory and attention, and by ensuring consistency and completeness in carrying out surgical tasks.²⁵ Providing 'checklist fatigue' does not set in, checklists help to manage the potential for making mistakes merely through being human. Other checks designed to support human systems may not always be so successful and may actually create errors. For example, medical alarms, if poorly understood, can *create* rather than reduce errors.²⁶

SUPPORTING SURGEONS

A number of professional bodies have recognised the need to support surgeons during their careers and have formalised this support by creating mentorship programmes. UK examples include the Association of Surgeons in Training and the London Deanery mentorship programmes for surgical trainees as well as the Royal College of Physicians and Surgeons of Glasgow programme for all fellows and members. In addition, many National Health Service trusts run in-house mentorship schemes. Mentoring, however, is deliberately broad in remit and long-term in nature, and it encompasses support in many aspects of professional and personal learning and development. Although undoubtedly valuable, it is not designed to prepare surgeons for, or to support them through, the particular consequences of a complication or error.

The need for further support mechanisms has been advocated by practitioners and researchers alike who recognise that current practice does not meet the psychological needs of surgeons or enable them to develop strategies to cope with adverse events.^{12,13,27,28}

It is also encapsulated in the duty of candour review.²⁹ The report recognises that in order to create a culture where staff disclose information about unanticipated events in a patient's care, they need to have training and support to do this. We would argue that embedded within such an approach should be the recognition that the support surgeons need will vary depending on the nature of the adverse event as well as the personality, coping strategies and experience of the surgeon.

An important precursor to providing appropriately variegated support for surgeons in the UK is a better understanding of the different facets of adverse events (both complications and errors) as well as the personal and professional impact that they might have. Previous research in this area has tended to focus on healthcare systems outside of the UK, with a particular emphasis on the US. Furthermore, most of the available studies from both the US and Europe have been limited by their small sample size, with few representing national samples.⁷ There is a growing preponderance of small qualitative studies that provide rich (and often compelling) information without necessarily being representative at all. This is compounded by the emphasis on errors, especially relatively rare but serious errors, where there may be a risk of litigation.

We aim to conduct a large-scale national study in the UK that will generate a quantified description of the impact on surgeons of both complications and errors, to enable us to compare their effects and isolate the factors that are associated with positive and negative impacts. The findings from our survey will hopefully provide a detailed national picture of the challenges, responses and resilience that surgeons have when dealing with the adverse events that are part and parcel of their working lives. This information will form the basis to provide

more appropriate and better-targeted support systems, enhancing the quality of both surgeons' professional and personal lives, and helping them to use their experiences to improve their practice.

Finally, we also recognise that surgeons are not unique in being impacted by errors and complications – the whole theatre and surgical care team may be affected. Our planned survey may therefore be the start of a much larger process designed to support those who care for patients.

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