



# Perioperative medicine:

Where we have come from and where we are heading



## A key pillar of the ANZCA Strategic Plan 2018-2022 is the development of an effective, integrated and collaborative perioperative care model.

Perioperative medicine (POM) is a developing field aimed at helping all patients but in particular our most vulnerable.

Intraoperative mortality is now extremely rare (1:100,000 cases)<sup>1</sup>. However, post-operative complications cause morbidity and are the third leading cause of death in the developed world. Contributors to these figures include:

- Suboptimal risk assessment.
- Lack of shared decision making.
- Inadequate optimisation prior to surgery.
- Failure to rescue.
- Fragmented post-operative management<sup>2</sup>.

ANZCA has committed to improve the care of patients throughout the surgical journey – from the moment the primary care provider refers for consideration of surgery until the completion of rehabilitation and return to the community. The goal is to improve and balance the risk and benefits of surgical and non-surgical options.

The first step commenced with a review and update of the curriculum to enhance our trainees' awareness of perioperative medicine. It is now a training requirement that trainees understand core perioperative medicine issues such as delirium, high risk assessment, prehabilitation and frailty.

In 2014, ANZCA convened a working group to review the current state of POM in the developed world, and proposed a different way of caring for surgical patients for the future. In 2016 the working group reported to ANZCA Council resulting in a decision to progress a formal qualification in POM – a historic decision as ANZCA is the first medical college to formalise the process under the umbrella of a specialist college.

With so many stakeholders in POM including (but not limited to) surgeons, physicians, geriatricians, intensivists, primary care and allied health professionals, ANZCA has taken the lead and is considering a POM qualification, with representation and input from the above colleges and sub-specialty experts reflecting the multi-specialty and multi-disciplinary nature of perioperative medicine.

## Our vision

By 2023, the following should be in place:

**Defendable economic case for perioperative care (POM).**

**Collaborative lobbying for the advancement of POM.**

**Government, health sector and community awareness of the benefits of POM.**

**External courses that support aspects of perioperative medicine are formally recognised.**

**ANZCA professional documents related to POM.**

**A formal POM qualification.**

**Training site accreditation of POM departments.**

**Patient-centred education and awareness of benefits of POM.**

ANZCA is sourcing and guiding the process, but recognises it cannot be done alone. This qualification will potentially be a post-graduate qualification modelled on the pain fellowship and will have specific training requirements consistent with the best models of medical education now available. Those currently practising in perioperative medicine and who fulfill appropriate criteria will be acknowledged appropriately. The exact format of this qualification is under development and will be informed by the recent POM survey and project group findings.

The college has invested considerable resources into POM and has an internal project team led by ANZCA's Director, Education Oly Jones to co-ordinate the many work streams needed.

POM is a key area of focus for the college, and overall governance is through a steering committee under the leadership of ANZCA Vice-President, Dr Vanessa Beavis. In addition to ANZCA and its Faculty of Pain Medicine, there is multidisciplinary representation from the College of Intensive Care Medicine, the Royal Australasian College of Physicians, the Royal Australasian College of Surgeons, the Royal New Zealand College of General Practitioners, the Royal Australian College of General Practitioners, and the Australian College of Rural and Remote Medicine. Community representation is also being sought.

### So where to from here?

We will be consulting widely with ANZCA members and those from other medical colleges to ensure that we craft training options that appeal to various professional stages; flexible modular training, professional standards that support high quality care, CPD integrated into current systems, and specific approaches for those wanting to take time out to do year long (or more) training. The first two have commenced:

- Education development (overseen by ANZCA councillor Dr Sean McManus). This will focus on the development of a statement about what a POM specialist is able to do and a curriculum framework that outlines the skills and knowledge required.
- The development of perioperative care models (overseen by POM Special Interest Group Chair, Dr Jeremy Fernando). This will focus on describing what is happening now in POM in Australia and New Zealand. It will also look to provide a framework on how a hospital/health service can provide an integrated, evidenced-based perioperative service.

Later work will consider:

- The economic case for POM.
- Professional standards and policies.
- Development of POM CPD.

### Summary

Perioperative medicine is an exciting field with huge potential to improve outcomes for our most vulnerable patients. It allows us to learn from and work with other disciplines.

Our patients receive excellent care while in theatre. Now let's see if collectively, we can improve their care before and after.

#### Dr Jeremy Fernando

Chair, Perioperative Care Working Group

#### Dr Vanessa Beavis

Chair, Perioperative Medicine Steering Committee, Vice-President, ANZCA

#### Dr Sean McManus

Chair of the PoM Education Development Working Group, ANZCA Councillor

### References:

1. Daniel Sessler, John W. Severinghaus Lecture, 26th October 2016, American Society of Anesthesiologists Annual Meeting)
2. Ferraris, VA, et al (2014) "Identification of patients with postoperative complications who are at risk for failure to rescue" JAMA Surg, Nov;149(11)

## POM literature review

ANZCA commissioned a review of recent peer reviewed and grey literature to better identify the coordinated POM care models that are effective in improving patient outcomes and cost efficiency.

The review found that that a co-ordinated and collaborative multidisciplinary and multi-faceted model of perioperative care is effective in providing clinical benefits for patients and in reducing costs for health systems and providers. There are common core elements across the models. These include a multidisciplinary team; collaboration; close working relationship between team members leading to effective teamwork and communication; good leadership; a patient-centred approach (including patient education and shared decision-making); clear protocols and documentation; compliance; audit and reporting.

Key clinical and technical elements of enhanced recover after surgery (ERAS) models have been specified generally and for specific conditions and are documented throughout the literature.

The literature review will inform our work on models of care and education development.

The literature review is available on our website.

# Survey – what you think

In October last year, we surveyed all 7751 ANZCA and FPM fellows, trainees and specialist international medical graduates for their views on perioperative medicine (POM) practice today, the skills required for perioperative care and the level of support for the development of POM training.

The survey achieved a 27 per cent response rate (n=2077). POM Special Interest Group members represented about 15 per cent of these responses.

Through the survey, the college has confirmed support to move forward with the development of perioperative medicine education offerings.

Almost two thirds of respondents thought it reasonable to do an extra year of training to become a perioperative medicine specialist. Support was highest among trainees (74 per cent) and lowest in specialists with 20-30 years of experience.

Similarly trainees and provisional fellows (56 per cent and 53 per cent respectively) were more likely to consider doing an additional year of training. Specialists with more than 30 years of experience were least likely to consider any additional training (19 per cent).

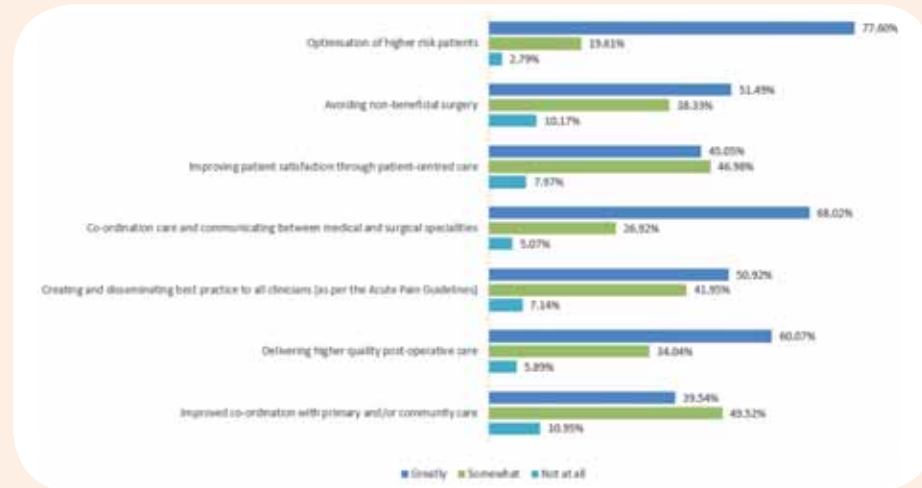
More than 70 per cent of respondents want a POM specialist to have:

- Preoperative management skills to identify and mitigate risk factors.
- Postoperative management skills including consideration of surgical stress response, fluid management, acute and persistent pain, and delirium management.
- Discharge planning and an understanding of intraoperative anaesthesia management.

Most respondents saw a perioperative medicine service and/or specialist adding particular value in optimising care for higher risk patients (77 per cent), co-ordinating care between medical and surgical specialties (68 per cent) and delivering high quality postoperative care (60 per cent).

## Value of perioperative services

*"In which of the following areas do you see a perioperative medicine service/specialist adding value to your clinical practice? Please rate as greatly, somewhat or not at all."*



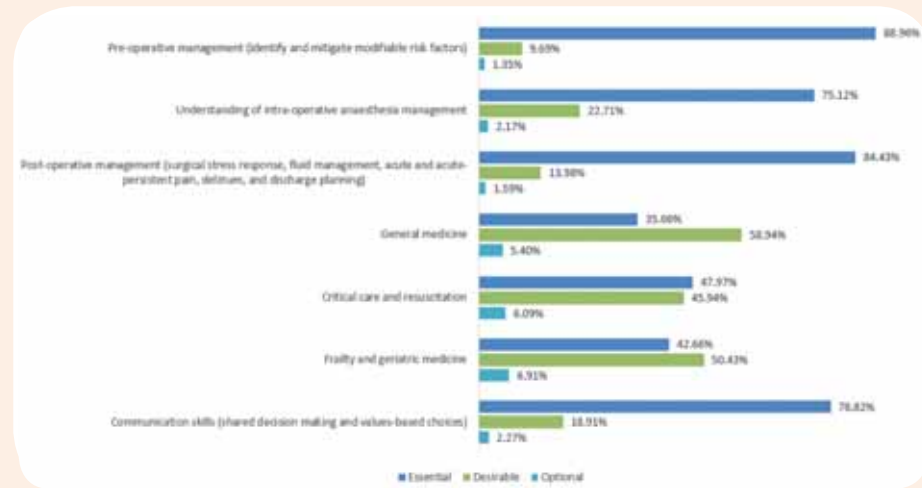
A significantly high 89-97 per cent of respondents saw at least some value in all areas addressed.

Areas rated most highly were "optimisation of higher risk patients" (77.6 per cent rated "greatly") and "co-ordination of care and communicating between medical and surgical specialties" (68.02 per cent rated "greatly").

Those rated of lower value were "improved co-ordination with primary and/or community care" (10.95 per cent rated "not at all") and "avoiding non-beneficial surgery" (10.17 rated "not at all").

## Required skills and knowledge

*"What additional skills and knowledge does a perioperative medicine specialist require? Please rate as either essential, desirable or optional."*



A very high 93-98 per cent of respondents rated all areas as desirable or essential.

Four areas were rated highly as "essential":

- Pre-operative management (identify and mitigate modifiable risk factors) – 88.96 per cent.
- Post-operative management (surgical stress response, fluid management, acute and acute-persistent pain, delirium and discharge planning) – 84.43 per cent.
- Communication skills (shared decision making and values-based choices) – 78.82 per cent.
- Understanding of intra-operative anaesthesia management – 75.12 per cent.



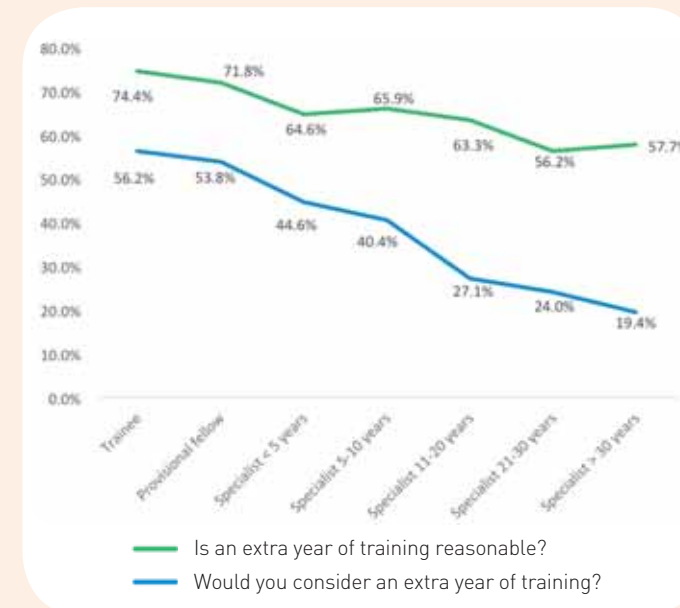
## Extra year of training

*"Do you think doing an extra year of training is reasonable to become a perioperative medicine specialist?"*

63.65 per cent (N=1,322) – Yes.

*"Would you consider doing an extra year of training?"*

35 per cent (N=727) – Yes.



# The value proposition of perioperative medicine

Anaesthetists are at the forefront of local and international perioperative medicine initiatives and programs to deliver value-based care, writes Professor Bernhard Riedel.

It is estimated that one third of the global burden of disease is amenable to surgery.

In fact, when considering patients suffering trauma or a solid organ cancer diagnosis then the proportion of patients requiring surgery exceeds 60 per cent<sup>1</sup>. Current demographic change, with a global ageing population accompanied by an increasing incidence of cancer, likely necessitates a two-fold increase in surgical services by 2035.

The inability of developing nations to deliver essential surgical services to their populations is estimated to account for an estimated 17 per cent loss in gross domestic product (GDP)<sup>2</sup>, which in turn negatively impacts the ability to fund such essential surgical services – a catch-22 situation.

In contrast, in the developed world an unsustainable growth in the percentage of GDP that is spent on healthcare is unsustainable (ranging from about 10 per cent for Australia and about 17.5 per cent for the US).

This is compounded by the fact that the current aggregate of healthcare system performance delivers suboptimal value (value = patient outcomes + safety + satisfaction ÷ cost). This is illustrated by the Institute of Medicine estimating that loss in healthcare expenditure could be as high as 25-30 per cent in the US – largely attributed to waste (for example, unco-ordinated and inefficient healthcare systems and high variability in care delivery) and preventable adverse events (for example, postoperative complications such as venous thromboembolism (VTE) and wound infection...)<sup>3</sup>

There is no reason to believe that this loss in healthcare expenditure is substantially less in Australia. Consider repeated pathology tests due to inability to access external results, waiting lists and preventable complications. Australia, with an annual GDP of about \$A1.2 trillion, spends approximately 10 per cent of its GDP (\$A120 billion) on healthcare. Loss in healthcare expenditure, through waste from inefficient systems and preventable complications, could be about \$A30 billion (2.5 per cent GDP) per annum – funding that could be utilised more efficiently with improved systems.

Postoperative complications, many of which are preventable, are common. The National Surgical Quality Improvement Program, a national (and increasingly used internationally) benchmarking tool administered by the American College of Surgeons, estimates that between one in four and one in six patients suffer all-cause or major postoperative complications across various hospitals<sup>4</sup>.

(continued next page)

## The value proposition of perioperative medicine (Continued)

Strikingly, the incidence of morbidity was similar between participating hospitals, but they reported a two-fold inter-hospital variation in mortality in patients that suffered postoperative complications. This “failure to rescue” from postoperative major complications likely reflects substantial variability in the quality of care delivery by individual hospitals. Variability in care delivery at clinician level is an important contributory factor in postoperative morbidity and mortality. This is illustrated for example by a 20-fold variation in volume of intravenous fluid administered by anaesthesia providers within the first hour of elective laparotomies<sup>5</sup>.

Similarly, Australian data demonstrated significant variability in clinical outcomes between high-volume and low-volume surgeons performing pancreaticoduodenectomy, with estimated hospital costs ranging between \$A38,000 and \$A80,000, respectively, per episode of patient care<sup>6</sup>. Not surprisingly these data demonstrated a strong correlation between number and grade of postoperative complications, length of hospital stay (LOS) and total cost of care (patients with no complications: average LOS = eight days and in-patient cost = \$A28,000 vs. patients with complications: average LOS = 13 days and in-patient cost = \$A57,000). However, there is more to delivering value-based care than removing individual clinician variability.

An important study by Glance et al<sup>7</sup> assessing feasibility of report cards for measuring quality of care delivery for cardiac surgery by anaesthetist and surgeon showed limited impact of individual practitioners on the composite outcome of major complication or death (albeit for few outlier surgeons on either end). Rather, they reported that more than one third of institutions had significantly higher adjusted odds ratio for postoperative major complications or death. This reflects the sum of the parts, whereby each member of a multidisciplinary team adds incremental harm/value, outweighing the individual talent of an anaesthetist or surgeon.

Centres of excellence are underpinned by high volume practice, with multidisciplinary teams centred around disease entities. Such centres are process driven, for example, prehabilitation and enhanced recovery after surgery (ERAS) teams, with infrastructure to be successful in quality improvement initiatives, including on-going closed loop audit and engaged executive teams with clinician leadership.

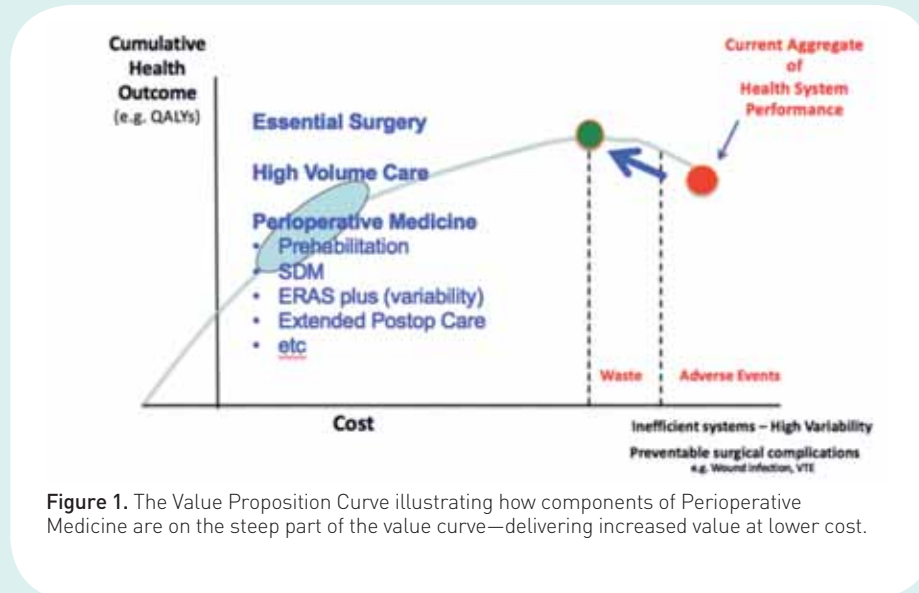


Figure 1. The Value Proposition Curve illustrating how components of Perioperative Medicine are on the steep part of the value curve—delivering increased value at lower cost.

Perioperative medicine is increasingly recognised as a multidisciplinary strategy to deliver on the value proposition (high-quality, high-value) within healthcare.

Perioperative medicine, underpinned by strategies such as redesigned perioperative care pathways to ensure timely and accurate risk stratification (identifying the ~20 per cent of patients that utilise ~80 per cent of healthcare resources), with early referral for prehabilitation to target modifiable risk (anaemia, malnutrition, deconditioning).

ERAS pathways, shared decision-making to avoid unnecessary surgery, surgery school to engage patients in their care journey, extended postoperative recovery units, postoperative perioperative medicine team-led rounds to prevent MET calls and failure to rescue, and rehabilitation into the community after surgery will all provide the opportunity to shift the value proposition curve (health outcomes [for example quality adjusted life years (QALYs)] versus healthcare cost) leftward and upward (see figure 1). If such a co-ordinated multidisciplinary approach reduced major complications (estimated at 15 per cent) by one fifth it creates the potential to harness a substantial proportion (possibly more than \$A1 billion) of the \$A120 billion that is spent on healthcare per annum in Australia, allowing for significant expansion of healthcare services, and research.

The multifaceted approach to perioperative medicine illustrates how incremental savings could amount to these cost saving estimates. For example, a recent review on preoperative malnutrition, a modifiable risk factor, suggests that two out of three patients presenting for gastrointestinal surgery are malnourished, with three-fold increased risk of morbidity and five-fold increase in mortality<sup>8</sup>.

**“It was estimated that for every \$US1 spent on nutritional therapy the hospital would save \$US52 in health costs.”**

It was estimated that for every \$US1 spent on nutritional therapy the hospital would save \$US52 in health costs. Yet, only one in five hospitals have formal nutritional screening processes and only one in five patients receive preoperative nutritional intervention.

Other modifiable risk factors include loss of functional capacity (deconditioning; with three- to five-fold increase in postoperative complication rates in patients that have anaerobic threshold <11 mL/kg/min), anaemia, smoking and alcohol, etc<sup>9</sup>.

Small randomised controlled trials of prehabilitation with exercise report that in patients having major abdominal surgery the overall complication rate was halved (RR = 0.5; 95% CI 0.3-0.8; p=0.001)<sup>10</sup>.

Similarly, a bundle of preoperative respiratory care, including patient education, was also accompanied by halving in postoperative pulmonary complications (HR = 0.48; 95% CI 0.30 – 0.75; p=0.001)<sup>11</sup>.

Implementation of a colorectal ERAS program across a provincial (Alberta, Canada) healthcare system resulted in significant reduction in LOS by 1.5 days and net cost savings of between \$US2806 and \$US5898 per patient<sup>12</sup>.



**“Implementation of a colorectal ERAS program across a provincial (Alberta, Canada) healthcare system resulted in significant reduction in LOS by 1.5 days and net cost savings of between \$US2806 and \$US5898 per patient.”**

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Perioperative medicine promises to deliver high-value care to health care systems. It describes the practice of patient-centered, multidisciplinary, and integrated medical care of patients from the moment of contemplation of surgery until full recovery<sup>11</sup>.

Perioperative medicine requires expertise to leverage the collaboration between purchasers, policy makers, all healthcare craft groups (including anaesthesia, surgery, pain medicine, general practice; medical specialties including haematology, cardiology, respiratory medicine; allied health including physiotherapy, exercise physiology, nutrition, psychology; and nursing including pre-anaesthesia clinics, and ERAS), the patient (shared decision-making, education, for example, surgery school and ERAS, community gym) and his or her support structure (motivation, accountability).

Key opportunities for increasing value through perioperative medicine include collaborative decision-making, lifestyle modification before and after surgery (prehabilitation to improve physiologic reserve and thereby reducing perioperative risk and rehabilitation and comorbid disease optimisation), standardised in-hospital perioperative care, and process mapping and audit to drive quality improvement initiatives<sup>13</sup>.

Anaesthetists are entering an exciting period with the opportunity to play a central role in this global initiative to deliver value-based care.

Numerous examples can be found at national level such as the Royal College of Anaesthetists through its perioperative medicine initiatives<sup>13</sup>, the American Society of Anaesthetists through the Perioperative Surgical Home, and with ANZCA and the Perioperative Medicine Special Interest

Group initiatives in Australia and New Zealand, while at institutional level clinicians are actively undertaking systems redesign on behalf of their patients<sup>14</sup>.

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