TRIPOM
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The rationale for perioperative medicine

Before completing this tutorial please answer the following MCQs:
True of False

1 Elective surgery across Europe is associated with an average mortality of 4%

2 1% of the global volume of surgery is associated with a serious adverse event.

3 Postoperative complications are associated with a reduction in long term survival which remains evident five years after surgery

4 ASA scoring allows for individualized characterization of perioperative risk.

5 "Failure to rescue" describes a failure to identify and treat postoperative complications expediently.

Key points:

- Postoperative morbidity should be considered to be a public health issue
- Comprehensive risk profiling can facilitate targeted perioperative interventions
- Prevention of 'failure to rescue' in a central objective of perioperative medicine

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Introduction

The Perioperative Medicine Programme established by the Royal College of Anaesthetists in January 2015 describes the development of a new medical sub-specialty aimed at improving patient care throughout the entire surgical journey[1]. The subspecialty of perioperative medicine has evolved in response to advances in surgical and anaesthesia techniques, enabling surgery to take place on an increasingly complex surgical population. On a global scale, almost 250 million operations are performed on

an annual basis, associated with a 3% rate of serious adverse events[2]. Across Europe, wide variations in mortality (4% in the UK) have been observed, perhaps reflecting unacceptable variations in the quality of surgical care provided[3].

In England the surgical population has changed dramatically. The number of annual surgical procedures has increased from 12 to 18 million from 1980 to 2012, with an associated increase in day-case surgery from 12% to 78%[4]. Our patients are older, and are consequently presenting for surgery with a greater number of associated comorbidities. Barnett et al showed that 65% of patients are aged 65-85 years and 85% of patients over 85 years of age have more than one comorbidity[5]. Effective perioperative services are therefore essential to reduce the risk of adverse outcomes and to reduce mortality and morbidity.

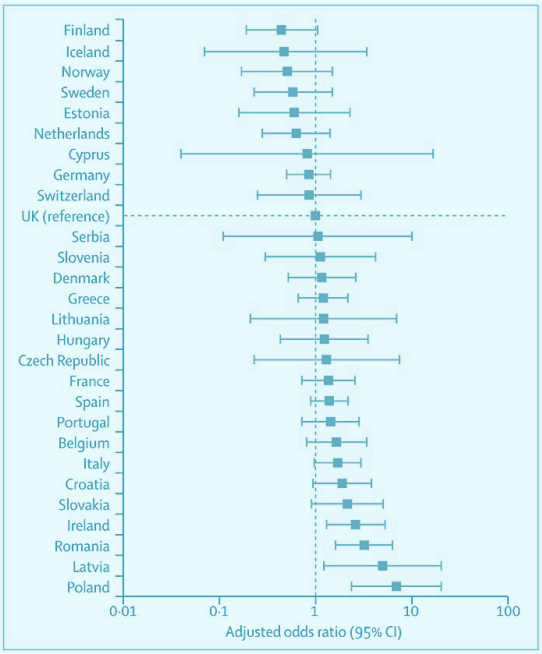
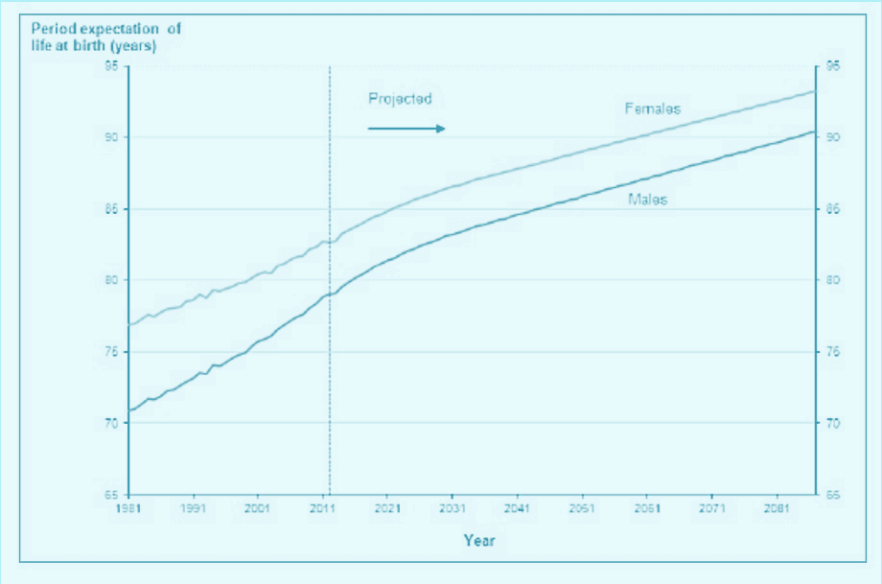


Figure 3: Adjusted odds ratio for death in hospital after surgery for each country

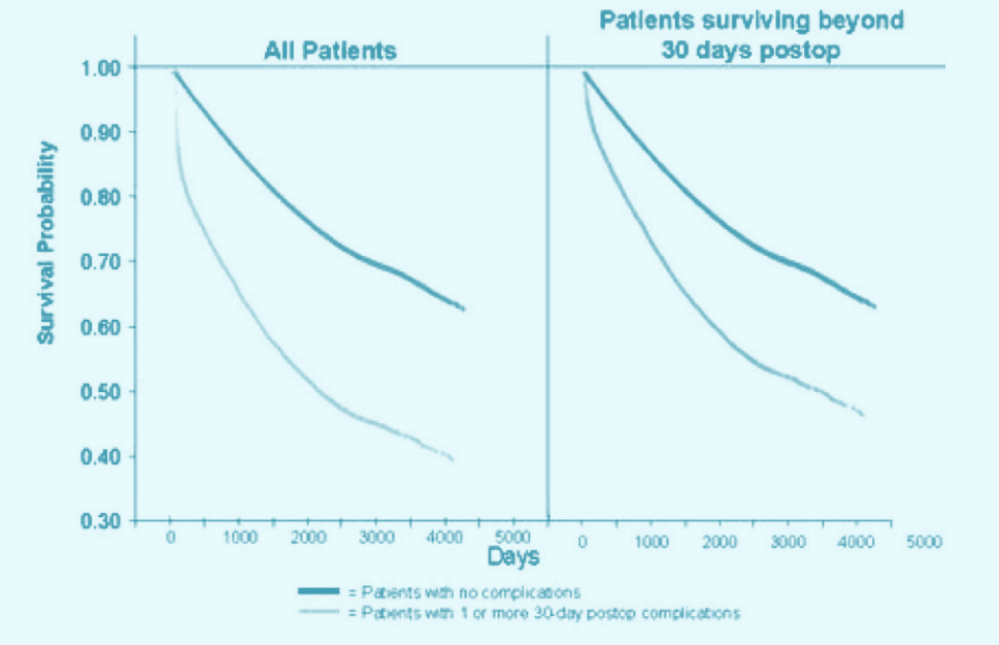
Reproduced from Pearse et al. Lancet. 2012

Surgery in the elderly can be life saving e.g. resection of cancer, or performed to improve quality of life such as joint replacements. The majority of patients presenting for surgery are low risk. However, an increasing proportion of the patient population are

presenting for surgery with more complex multiple morbidity, requiring intricate medical management compared to even a decade ago, posing a higher risk for surgery and anaesthesia. Their complexity leads to longer lengths of hospital stay, higher rates of readmission and, due to the increased probability of suffering prolonged functional impairment, higher costs both in hospital and to society as a whole. The development of postoperative complications now appears to be endemic in this population, with several NCEPOD reports repeatedly showing that patients who suffer complications after surgery are older, with multiple co-morbidities[6,7]. Currently, 80% of perioperative deaths occur in this high-risk population[8,6]. In the current UK system, a staggering 1 in 5 high-risk patients are not seen in a pre-assessment clinic before their operation[6].



There is strong evidence that post-operative complications are associated with a reduction in long term survival which remains evident even up to five years after surgery[9,10]. The primary rationale for the development of perioperative medicine as a medical subspecialty has been to enable the identification of patients at risk of surgical complications, to stratify their level of care based on pre-operative risk, and to provide a safety net on the post-operative wards to prevent complications from occurring.



Reproduced from Khuri et al. Ann Surg. 2005.

The RCoA vision document describes the role of the perioperative physician as that of an overseer of the entire perioperative pathway. This pathway begins at the point of referral for surgery. Individualised risk assessment is integral to an improved model of care and often form the first step in surgical pathways. A variety of algorithmic risk assessment tools are currently in use, but a degree of uncertainty exists regarding which tools are most accurately predictive of outcome. This is due in part, to differences in the various parameters used in each score[11], but is also due to methodological criticisms of the studies which compare them[12]. The ASA score is perhaps the most widely used risk stratification tool used amongst anaesthetists. However, ASA grade alone cannot be used to give a truly individualised assessment of risk. This is because it describes risk attributed to a population of patients rather than the individual[11]. A paradigm-shift away from generalized population based risk assessments is required and clinicians must calculate specific perioperative risk for each patient if care is to be truly individualised. If consent for surgery is to be fully informed, then this individual risk must be communicated to each patient[6]. More recently, a number of more specific risk assessment tools have been employed, such as the SORT score, and organ specific scores such as the ARISCAT score for post-operative pulmonary complications. These

tools provide a much more comprehensive characterisation of risk, enabling early identification of these high-risk patients and appropriate planning of care.

Postoperative management of complications in these high-risk patients on general surgical wards often tends to be reactive rather than pre-emptive resulting in 'failure to rescue' and potentially worse outcomes. Such emergent referrals to on-call specialties leads to a loss of continuity and suboptimal patient care. Non-critical complications such as postoperative cognitive disorders, pulmonary oedema and acute kidney injury may be missed due to the lack of proactive management. These eventualities may be avoided by formulating a concise postoperative plan for the individual patient in the pre-operative phase. Many new models of perioperative care focus on this post-operative phase, with the aim of preventing the failure to rescue phenomenon. The anaesthesia led-model at University College London Hospitals relies on a novel perioperative medicine clinical team who support the pre-assessment process with comprehensive risk assessment, and provide daily ward based follow-up care and surveillance until discharge.

The Proactive care of Older People undergoing Surgery (POPS) service at Guy's and St Thomas' is an example of perioperative care developed by elder care physicians to provide assessment and optimisation tailored to the physiological changes specific to the elderly population[13]. They also look at outcome measures that are not limited to single organ systems but have a wider approach to patient care extending to outcomes such as length of stay, functional recovery or need for institutionalisation[14]. Stress response to surgery and postsurgical stress in the elderly, both physiologically and psychologically, can lead to altered autonomic, endocrine, metabolic and immune functions. This combined with their pre-morbid condition and diminished reserve can drastically alter the recovery trajectory[15]. The POPS team at Guy's and St Thomas' is geriatrician led and work closely with anaesthetists and surgeons together with nursing staff, therapists and social workers to see around 1000 elective surgical patients a year[13]. The latest evidence and guidelines are used to optimise the patient in multiple fields including medical, functional, social and psychological. The patients are then followed up in the post-operative phase by geriatricians and care is scrutinised in multi-disciplinary team meetings to ensure continued best practice.

Education and training is required to provide a competent workforce in the delivery of perioperative care. In recognition of this fact, the Royal College of Anaesthetists have introduced mandatory units of training into its training curriculum. Training in perioperative medicine aims to focus the trainee to think about the patient as a whole, tailoring the anaesthetic and post-operative course to the individual patient physiology involving medical specialties as needed to ensure the patient is in the optimal

physiological state for them prior to anaesthesia and surgery[16]. Training should not be surgical specialty specific, but focus on tailoring treatment to each individual patient and their comorbidities guided by the latest evidence on best practice.

The provision of effective perioperative care will ultimate require a multi-skilled, multiprofessional team of clinician with a unified focus on improving outcomes after surgery. As our surgical population rapidly evolves, so too must out ability to provide safe and effective surgical care.

References

1 Perioperative Medicine: The pathway to better surgical care. RCoA, 2015. www.rcoa.co.uk/perioperativemedicine.
2 Weiser TG, Regenbogen SE, Thompson KD, Haynes AB, Lipsitz SR, Berry WR, et al. An estimation of the global volume of surgery: a modelling strategy based on available data. Lancet. 2008; 372(9633): 139–44.
3 Pearse RM, Moreno RP, Bauer P, Pelosi P, Metnitz P, Spies C, et al. Mortality after surgery in Europe: a 7day cohort study. Lancet. 2012; 380(9847):1059–65.
4 Appleby J. Day case surgery: a god news story for the NHS. BMJ 2015;351 h4060
5 Barnett K, Mercer SW, Norbury M et al. Epidemiology of multimorbidity and implications for health care, research, and medial education: as cross-sectional study. Lancet 2012;380 p37-43
6 National Confidential Enquiry into Perioperative Deaths. Knowing the Risk. NCEPOD 2011
7 National Confidential Enquiry into Perioperative Deaths. An age old problem: a review of the care received by elderly patients undergoing surgery. NCEPOD, 2010
8 Pearse RM, Harrison DA, James P, Watson D, Hinds C, Rhodes A, et al. Identification and characterization of the high-risk surgical population in the United Kingdom. Crit Care. 2006; 10(3):R81.
9 Khuri SF, Henderson WG, DePalma RG, Mosca C, Healey N a., Kumbhani DJ. Determinants of Long-Term Survival After Major Surgery and the Adverse Effect of Postoperative Complications. Ann Surg 2005; 242(3):326-41
10 Moonesinghe SR, Harris S, Mythen MG, Rowan KM, Haddad FS, Emberton M, et al. Survival after postoperative morbidity: a longitudinal observational cohort study. Br J Anaesth. 2014; 113(6): 977–84.
11 Warner DS, Rowan KM, Ph D, Grocott MPW. Risk Stratification Tools for Predicting Morbidity and Qualitative Systematic Review. Anaesthesiology. 2013;119:959-81.
12 Miller TE, Thacker JK, White WD, Mantyh C, Migaly J, Jin J, et al. Reduced Length of Hospital Stay in Colorectal Surgery after Implementation of an Enhanced Recovery Protocol. British Journal of Anaesthesia 2014;118(5):1052–61.
13 Dhesi J, Swart M. Specialist pre-operative assessment Clinics. Anaesthesia 2016;71(1) p3-8
14 Oresanya LB, Lyons WL, Finlayson E. Preoperative assessment of the older patient: a narrative review.
15 JAMA 2014;311(20) p2110-120
16 Kehlet H, Nielsen HJ. Impact of laparoscopic surgery on stress responses, immunofunction and risk of infectious complications. New Horiz 1998;6(2) s80-88

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–
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17 Carey, C. Developing training in perioperative medicine. RCoA 2015; Bulletin 93 p33