

Geriatricians in perioperative medicine: developing subspecialty training

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As life expectancy increases, so will demand for surgical management of age-associated degenerative and neoplastic pathology. Older people are at greater risk of adverse postoperative outcome, although advancing age in itself is not an independent risk factor.¹ This is likely as a result of age being closely linked with other independent predictors such as physiological decline, multimorbidity, and frailty.^{2–4} The postoperative complications frequently observed in older people are predominantly medical, rather than surgical, and are predictive of both short and long-term mortality.⁵

Delivering universal and consistent high-quality perioperative care for older people is a challenge that has not yet been addressed in the UK.⁶ Conventionally preoperative care is delivered by a surgical lead, with anaesthetic and nursing support. In the majority of patients after a decision to operate is made, a nurse-led assessment of anaesthetic and medical issues leads to a binary label of 'fit or unfit' for surgery. There can be a lack of emphasis on the optimization of health and social issues in order to reduce adverse postoperative outcomes. Abnormalities found on assessment are often referred to single-organ specialists or back to primary care, which may delay surgery. Furthermore, GPs and physicians may not have had training in perioperative medicine and are therefore not familiar with evidence-based interventions to reduce perioperative risk.⁷ In addition single organ physicians may be less experienced in dealing with multimorbidity. Prolonged delays, or even exclusion from all future surgery, can occur. Postoperatively, medical complications are reactively referred to on-call medical services or specialist medical teams, with little or no proactive evaluation, continuity or follow-up.

This process may work for younger and uncomplicated patients, but is less suited to older people who often have complex medical and social needs. Multiple national reports have highlighted discrepancies between the need for, and access to, surgery.^{8,9} Poor care coordination for older patients is well recognized.^{6,10} Data is emerging that outcomes can be improved through involvement of geriatricians in the perioperative pathway.¹¹ The use of comprehensive geriatric assessment (CGA), tailored to the needs of the older surgical patient, can help to preoperatively optimize health and social issues, postoperatively manage acute and chronic disease, and coordinate care to ensure a timely and effective discharge from hospital.¹² Using this process in orthogeriatrics has demonstrated quality improvement and cost-effectiveness in care for patients with hip fracture.¹³ However, in other surgical subspecialties, such as joined up models of care remain less well developed.

The response of the medical establishment to the needs of older surgical patients has been slow. A survey of surgical trainees found that over two thirds considered their training in this area inadequate.¹⁴ The Royal College of Anaesthetists 2010 revised syllabus saw the removal of the section 'Anaesthesia and the Elderly'. The medical registrar syllabus states that trainees should gain experience in 'Medical Problems Following Surgical Procedures'. In reality, practical experience is only gained when on call through reacting to crisis calls from surgical teams, with little opportunity to use these clinical encounters as training opportunities. Overall there is insufficient emphasis on training in preoperative optimization, postoperative medical care and discharge planning for older surgical patients.

In contrast, geriatric medicine training is embracing this paradigm change in perioperative medicine. The Joint Royal Colleges of Physicians Training Board's (JRCPTB) 2013 geriatric medicine curriculum, includes 'Perioperative Medicine for Older People', in addition to the established 'Orthogeriatrics' unit (Table 1). Practically though, this may still be seen as aspirational given that few NHS trusts have dedicated geriatric perioperative medicine services to provide training; in a UK survey of 161 NHS Trusts, only 12% had formal arrangements with geriatricians for preoperative care, and 20% for postoperative care.¹⁵

The geriatric syllabus acknowledges that dedicated perioperative services may not be universally available. In their place, practical learning methods are suggested including liaison work on surgical wards, attending nurse-led pre-assessment clinics, and attachments with other disciplines such as anaesthetics. Supervised work-based assessments and reflective practice should be completed to document competency in these areas.

Alternative approaches emerging to fill the training gap include: electronic distance learning such as Cardiff University's short course in 'Surgery in Older People',¹⁶ and University College London's Masters in 'Perioperative Medicine',¹⁷ and conferences such as the British Geriatric Society POPS (Proactive Care of Older People Undergoing Surgery), Age & Anaesthesia Association, and Evidence Based Perioperative Medicine (EBPOM) meetings.

For trainees considering perioperative medicine as a career, a subspecialty clinical placement is key for dedicated training. In the UK, the JRCPTB provides registrars in training posts, time 'Out Of Programme' (OOP) to follow specialist interests.¹⁸ The first OOP in perioperative medicine was established at Guy's and St Thomas's Hospital POPS department. Now in its

Table 1 British Geriatric Society's curriculum for Perioperative Medicine for Older People

Perioperative Medicine for Older People
To know how to risk assess, optimise and manage the older elective and emergency surgical patient throughout the surgical pathway
Knowledge
Demographics and political landscape relevant to the older surgical patient
National reports and policy drivers relevant to the older surgical patient
Models and pathways of care for older surgical patients
Risk assessment of perioperative morbidity and mortality (including use of tools e.g. POSSUM and investigations e.g. Cardiopulmonary exercise testing)
Modification of risk including the use of organ specific national and international guidelines (e.g. European Society Cardiology)
Use of inter-disciplinary and cross-speciality interventions to improve postoperative outcome (e.g. therapy delivered pre-habilitation)
Skills
Clinical assessment with appropriate use of investigations and tools to preoperatively risk assess for perioperative morbidity and mortality
Communication of risk with health professionals and patients/relatives
Timely medical optimisation of comorbidity and geriatric syndromes
Appropriate allocation of postoperative resources (e.g. use of level 2 and 3 care)
Decision making regards rehabilitation, and timely and effective discharge pertinent to the surgical patient
Liaison with patients, anaesthetists and surgeons to ensure shared decision making
Application of ethical and biomedical approaches to ensure appropriate ceilings for escalation of care
Behaviours
Objectively assess the risk-benefit ratio of surgery for older patients without value-laden judgement
Develop confidence in the added value of the geriatrician's role in shared decision making
Appreciate the importance of collaboration between geriatricians, anaesthetists and surgeons in promoting high quality care
Specific learning methods
Attend clinics where comprehensive geriatric assessment methodology is used to improve outcomes
Participate in routine nurse led preassessment and high risk anaesthetic led preassessment of older surgical patients
Liaison work on surgical wards
Attend surgical ward multidisciplinary team meetings
Attend training days and conferences relevant to the older surgical patient (e.g. POPS training day, AAGBI training day, Age Anaesthesia Association meetings)

fourth year, it has seen a previous OOP trainee become a consultant in perioperative medicine, setting up a new hospital service, and other trainees developing clinical experience and skills in care for older surgical patients, quality improvement methodology, research, and education and training. Although open to both geriatric medicine and anaesthetic trainees, only the former have applied so far. Many more dedicated posts such as this are needed to meet future national service needs.

Departments can secure funding for an OOP through either local service delivery agreements or research funding. Trainees can apply for advertized OOP posts outside of their usual training regions, allowing national access to training in specialist units. In addition, this helps to disseminate knowledge and good practice back to the trainees' locality on return to their training programme. For time in OOP to be accredited to training and achievement of Certificate of Completion of Training, OOP posts need prospective approval by the General Medical Council. If ratified, the role converts from an added-to-time OOPE (Experience), to incorporated-in-training OOPT (Training). Achieving OOPT status is not necessary for creation of, or application to, a subspecialty training post, and this should not deter Trusts or trainees.

The explicit aim of a subspecialty post should be to develop clinicians as perioperative specialists. Standard clinical geriatric training objectives should be continued during the OOP: management of complex comorbidity, acute medical care, and discharge

coordination. In addition, perioperative specialists need in-depth knowledge and skills in perioperative clinical care, quality improvement, including service development, and education and research, all of which are discussed below. Early mentorship and protected learning time are essential to meet these objectives.

Perioperative clinical care

Specialist training in the medical management of older surgical patients must encompass the whole clinical pathway. Preoperatively, skills include assessments of baseline medical and social issues, and understanding how to combine these with objective risk assessment tools from the perioperative and geriatric literature (e.g. P-POSSUM, Edmonton Frail Scale), to provide patients with a personalized expectation of postoperative outcome. Trainees should learn to use this comprehensive assessment to identify areas for optimization and apply disease specific guidelines (e.g. COPD, hypertension, AF) and perioperative medicine guidelines (e.g. anticoagulant bridging, pulmonary hypertension, obesity). Trainees should understand how to address risk-benefit and shared-decision making of surgery in the context of other medical and social issues, whilst tailoring communication to older people, taking into account health literacy, as well as impairment of cognition and sensation (hearing, sight). Postoperatively, skills are required in acute medical management, rehabilitation and discharge planning, all tailored to the

particular surgery (e.g. amputation, hip fracture repair, stoma formation). Throughout the perioperative pathway trainees need to be aware of when to make advanced care plans, decide on ceilings of care and provide palliation.

All of this requires multidisciplinary and cross specialty working. For a deeper understanding of the work undertaken by colleagues, and which interventions will benefit patients most, time should be provided to shadow and work alongside doctors of different disciplines, and the wider multidisciplinary team, including nurses, therapists, social workers and pharmacists.¹⁹ Awareness of the interests of all that work in the perioperative pathway will help in understanding the need for, and development of, future local services.

Quality improvement and research

As few geriatricians in the UK are involved in perioperative care, subspecialists will be expected to develop innovative collaborative services within their local centres. In preparation, trainees should be mentored in designing and leading quality improvement projects to effect change. This should be underpinned by attendance at management and finance meetings to gain understanding of the process of service development.

Experience in clinical research is desirable in order to develop the subspecialty. Beyond understanding the literature, support should be provided to answer novel questions through local Research and Development departments and access to specialist society grants (e.g. National Institute of Academic Anaesthetists, British Geriatric Society). Although the majority of surgery occurs in older people, they are often excluded from trials; learning how to advocate for their inclusion in research will result in meaningful outcomes.

Education and training

Dissemination of specialist knowledge needs to occur on a local and national level. Trainees should attend and contribute to local interdepartmental audit and interprofessional meetings, recognizing the educational needs of a range of healthcare professionals. Nationally, perioperative conferences are encouraging specialty engagement beyond their traditional audiences (e.g. BGS POPS, Age & Anaesthesia Association and EBPOM conferences). Trainees should be provided with ring-fenced time to attend and present work at these national meetings.

In conclusion, subspecialist training for geriatricians in perioperative medicine needs to expand to meet future service needs, and integrate and shape the perioperative pathway for older people. Developing specialist OOP training programmes will help to disseminate evidence-based practice, while training specialists equipped to establish clinical services and pathways.

Declaration of interest

J.S.L.P. is a member of the British Geriatrics Society Proactive Care of Older People undergoing Surgery (POPS) Special Interest Group (SIG). J.K.D. is a member of the Royal College of Anaesthetists' working party on perioperative medicine, a member of the AAGBI guidelines on perioperative care for older people, a member of the NICE guideline development group for preoperative testing, and chair of the British Geriatrics Society Proactive Care of Older People undergoing Surgery (POPS) Special Interest

Group (SIG). Work includes review of the SpR curriculum. The other authors have no conflicts of interest to declare.

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British Journal of Anaesthesia 116 (1): 7–11 (2016)
Advance Access publication 7 May 2015 · doi:10.1093/bja/aev113

I-AIM framework for point-of-care gastric ultrasound

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Gastric ultrasound (GUS) is an emerging point-of-care diagnostic tool to examine stomach contents and determine pulmonary aspiration risk at the bedside.^{1–7} This type of assessment is useful to guide airway and/or anaesthetic management in the acute care setting, when NPO (nil per oral) status is questionable or unknown. A point-of-care ultrasound application has a well-defined purpose, aimed at improving patient outcome and is therefore focused and goal oriented; the findings need to be easily recognizable and the examination easily learnt and quickly performed at the patient's bedside.⁸

GUS complies with these characteristics. It is a limited examination to assess gastric content type (empty, clear fluid, thick fluid/solid)^{1 3 4} and volume,^{2 5} with the ultimate goal of preventing pulmonary aspiration, therefore being focused and goal-oriented. It can be performed by clinical anaesthesiologists with a minimum of 33 scans, required by trainees to obtain an accuracy of 90%, which suggests that it is easy to learn.⁹ In addition, the findings are accurate and reliable.^{2 5 10}

The ultrasound diagnosis of empty and solid content states is usually self-evident and represents extremes of aspiration risk (low and high respectively).^{1 3 4} In addition, when the stomach contains clear fluid, its volume can be determined based on a cross-sectional area of the gastric antrum (CSA) which further defines aspiration risk.^{2 5 7}

However, ultrasound is often cited as the most operator-dependent of all imaging modalities.¹¹ Protocol-guided ultrasonography ensures examination consistency, fast and correct image acquisition, decreased examination times and accurate diagnosis and annotation.¹¹ Several protocols and guidelines for point-of-care ultrasonography have been described in the intensive and emergency care settings. Examples of such protocols are the focused assessment of transthoracic echocardiography (FATE),¹² the focused echocardiography in emergency life support (FEEL),¹³ and focused lung ultrasound (BLUE).¹⁴ Focused assessment with sonography for trauma (FAST) is a well-established backbone of emergency trauma management.¹⁵ The recently proposed I-AIM framework (Indication; Acquisition; Interpretation; Medical management) describes a logical stepwise approach to point-of-care ultrasound exams and offers a procedure-

specific standardized approach to implementation for improving use and performance.^{16 17}

We suggest a framework, based on the I-AIM model, for the clinical implementation of point-of-care GUS which can also serve as an educational tool during theoretical and hands-on sessions. In addition we present a sample report template for standardized written communication of findings.

Indication

Being a new tool, most current indications for GUS are mechanism-based rather than evidence-based (Table 1). The main indication is pre-anaesthetic aspiration risk assessment, in patients in whom prandial status is questionable. This includes urgent or emergency surgical procedures, major comorbidities that may delay gastric emptying (e.g. diabetic gastroparesis, advanced liver or renal dysfunction, critically illness), or questionable adherence to fasting instructions (e.g. cognitive dysfunction, altered sensorium).⁷ Preliminary but growing evidence suggest that GUS changes aspiration risk stratification and helps guide anaesthetic and airway management.^{6 18}

GUS findings have been validated in patients with normal gastric anatomy. Qualitative information on stomach contents in patients with structural abnormalities (e.g. previous lower oesophageal or gastric surgery, hiatal hernia, gastric cancer) can still be useful. However, volume assessment may not be accurate.

Acquisition

Image acquisition relates to patient, probe, picture and protocol considerations.¹⁶

The most useful patient position is the right lateral decubitus (RLD), as a greater proportion of stomach contents will move towards the more dependent antrum following gravity, thus increasing the sensitivity of the test to detect small volumes.¹ In critically ill patients however, it might not be possible to scan in a position other than supine.¹⁹ The upper abdomen is exposed and gel is used as an acoustic medium.

In adult patients, a curved array low-frequency probe (2–5 MHz) is required and abdominal settings are selected. In lean or paediatric patients, a linear high-frequency probe (10–12 MHz)