

Editorial

Back to the future of academic anaesthesia: publication outputs of UK anaesthetists

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Your future is whatever you make it, so make it a good one!

Emmett 'Doc' Brown, Back to the Future Part III

Over a decade ago, a bibliographic analysis of publications in anaesthetic journals by Feneck and colleagues indicated that, if the identified trends persisted, 'UK anaesthesia' would cease research publishing entirely by 2020 [1,2]. The intervening years have thankfully demonstrated that this is not the case. However, the extent to which this prediction had been avoided has remained unknown until now. In the current issue of *Anaesthesia*, Ratnayake and colleagues replicate and then expand on Feneck's analysis, focussing on the years 2017-2019 in order to establish the current 'capacity' of UK clinical academic anaesthesia [3]. They report that whilst the disappearance of UK anaesthesia publications has not come to pass, the number of outputs has nevertheless declined. Furthermore, a number of concerns are identified including that primary research represents a minority of outputs, the number of academic units of anaesthesia appears to have dwindled to less than half the number identifiable a decade ago, and that both women and people from ethnic minority backgrounds are proportionally under-represented amongst the clinical academic community; findings that should prompt self-reflection by our specialty. In this editorial, we review the methods that Ratnayake and colleagues use in their analysis, consider how the context of clinical academic careers may have contributed to their findings, and ask what their study means for the future of UK academic anaesthesia.

Measuring academic success

Measuring 'success' in academia has long presented a challenge. Though bibliographic metrics based on number of publications, journal impact factor and number of citations, as used by Feneck and replicated by Ratnayake [1,3], have traditionally been used to assess academic performance and productivity [4], this does not recognise or give credit to those who are thought leaders, quality improvement specialists, policy experts or teachers who inspire subsequent generations of thinkers. The system of rewarding only those with the types of outputs valued by elite universities confines young academics with an array of talents and interests into traditional research. That this approach discourages diversity and stifles creativity in an already contracted academic world has been recognised at a strategic level; writing in The Royal Society's 2017 report on *Research Culture*, Dame Ottoline Leyser, director of UK Research and Innovation, stated that 'diversity is being crushed by narrower and narrower criteria for assessing success' [5]. The recognition of the troubling consequences of the oversimplification and misuse of metrics has led to the establishment of

international movements calling for improvements in the evaluation of research, such as the San Francisco Declaration on Research Assessment and the UK Independent Review of the Role of Metrics in Research Assessment and Management [6,7]. However, despite this groundswell of recognition, institutions and individuals remain reliant on quantifiable outputs in order to gain funding and academic prestige. As such, bibliometrics remain central to academic practice, and may affect the prospects of employment or promotion [4]. Faced with the demands of working within a system that, whilst universally recognised as flawed, seems impossible to replace, it is easy to see how academic clinicians can struggle to balance providing the best clinical care with the demands of publishing and grant writing [8]. This, as Ratnayake's findings imply, may be a particular challenge for those who work in 'craft' specialities such as anaesthesia, pain and critical care medicine.

What 'counts' in academic output?

Central to the interpretation of the success of UK academic anaesthesia is the definition of what counts as research. In their original paper, Feneck and colleagues included only experimental research, randomised controlled trials (RCTs), large observational studies which included statistical interpretation, and bench studies [1]. As Ratnayake points out, this excludes some methodologies that are now considered mainstream, most notably meta-analyses, which have made numerous valuable contributions to evidence and practice in recent decades [3,9]. Whilst the inclusion of a broader range of methodologies in Ratnayake's analysis better represents the impacts of academic anaesthesia on evidence and practice, there are methodological features of this study that may nevertheless perpetuate an incomplete picture of academic output [3]. Firstly, the division made between 'primary' and 'secondary' research (where 'primary' only includes laboratory and bench studies, and clinical trials) introduces a dichotomy which tacitly devalues some methodological approaches. For example, though cohort and case-control studies, surveys and qualitative research reveal new knowledge (and would therefore be considered 'primary' by many), these are deemed 'secondary' according to Ratnayake's chosen methods. This may not fully serve the purpose of the exercise (i.e. to assess academic capacity), considering the range and variety of research questions within the scope of anaesthesia as illustrated in the James Lind Alliance research priority setting partnership (box 1) [10], many of which may be best addressed through observational or qualitative approaches [11-13]. And secondly, limiting the search to a relatively small number of anaesthesia and general journals, whilst appropriate for comparison with Feneck's findings, does little to account for the broad reach of research in anaesthesia and peri-operative medicine [1,3].

- What can we do to stop patients developing chronic pain after surgery?

- How can patient care around the time of emergency surgery be improved?
- What long-term harm may result from anaesthesia, particularly following repeated anaesthetics?
- What outcomes should we use to measure the 'success' of anaesthesia and perioperative care?
- How can we improve recovery from surgery for elderly patients?
- For which patients does regional anaesthesia give better outcomes than general anaesthesia?
- What are the effects of anaesthesia on the developing brain?
- Do enhanced recovery programmes improve short and long-term outcomes?
- How can preoperative exercise or fitness training, including physiotherapy, improve outcomes after surgery?
- How can we improve communication between the teams looking after patients throughout their surgical journey?

Box 1: the 'top ten' research questions from the James Lind Alliance research priority setting partnership on anaesthesia and perioperative care [10].

What is 'anaesthetic' research?

Anaesthesia is a clinical specialty that works in many contexts as part of a broad multidisciplinary team. It is therefore not surprising that many academic contributions by anaesthetists are similarly diverse in focus. Neuroscience, critical care, paediatrics, medical education, patient safety, and resuscitation, for example, are all fields in which anaesthetists are known to contribute, but the many journals that report studies from these fields were not represented in Ratnayake's data [3]. By using more inclusive criteria, Ausserer and colleagues' study of publications originating from anaesthetic departments in G-20 countries between 2001 and 2015 identified publications in 74 anaesthetic journals and 4117 non-anaesthetic journals [14]. Though it cannot be determined how many of these were authored by UK anaesthetists, and a direct comparison with Feneck or Ratnayake's data is therefore not possible, that non-anaesthetic journals represented the majority of outlets by a factor of 50 provides a sense of the diversity of outputs that anaesthetists create. Furthermore, Ausserer notes that the proportion of the original articles by anaesthetists that were published in anaesthetic journals decreased from 74% to 41% over the study period. If this trend is representative of UK outputs, it is possible Ratnayake may have missed a larger proportion of publications by UK anaesthetists than Feneck did in 2008 [1,3,14]. Whether this potential unseen increase in contributions to journals focussed on other disciplines exists requires further investigation; whether it could satisfactorily 'offset' the fall in papers

published in mainstream anaesthesia and general journals depends on the definition of ‘academic anaesthesia’ that we choose to adopt. We suggest that as members of a specialty that invariably works with others, anaesthetists should be proud to collaborate and contribute beyond the boundaries of their own professional territory.

Supporting UK academic anaesthesia

Anaesthesia remains under-represented in clinical academia, with just under 0.5% of anaesthetists’ time spent in senior university posts, compared to around 3% for doctors overall [15,16]. Since the publication of Savill report and Modernising Medical Careers in 2000 however, many constructive steps have been taken to promote clinical academia [17,18]. The establishment of National Institute of Health Research and the integrated clinical academic training pathway has paved the way for more accessible and structured academic training [19,20]. However, as Ratnayake points out, the number of pre-doctoral academic core and specialty training posts, known as academic clinical fellowships (ACFs), available to anaesthetic trainees is minimal in comparison to the size of the specialty [3]. This is likely a reflection of the capacity for supervision by senior academics rather than the quality or enthusiasm of applicants. Fortunately, this situation appears to be gradually improving; according to the Medical Schools Council, the number of university-affiliated senior academic anaesthetists in the UK has steadily increased from a low of 51 full-time equivalent (FTE) senior clinical academics in 2011, to 64 FTEs in 2018 [16].

Though the absolute number of academic anaesthetic consultants and trainees remains very low, UK academic anaesthesia has undergone an important structural transformation since the Pandit report described a ‘severe crisis in academic anaesthesia’ in 2005 [21]. A co-ordinated national strategy was formulated and the National Institute of Academic Anaesthesia (NIAA) was established in 2008, with the aims of improving patient care through the translation of research into practice; raising the profile of academic anaesthesia; facilitating high-profile influential research; and supporting academic training and continuing professional development. Importantly, the NIAA also administers funding opportunities specifically focussed on anaesthesia and peri-operative medicine [22]. Subsequently, the Health Services Research Centre was launched in 2011 to oversee the delivery of research projects from the Royal College of Anaesthetists [23], and the UK Perioperative Medicine Clinical Trials Network was set up in 2015 with the aim of developing and supporting multi-centre trials. With these stakeholder organisations now in-place and poised to support academic anaesthesia, what else do we need to do in order to achieve success?

The future of UK academic anaesthesia

Reflecting on the professional role of the anaesthetist, a 2016 *Guardian* article by an anonymous author opens with the assertion that anaesthetists 'have to get used to being invisible' [24]. This seems also to be the case for many academic anaesthetists, as evidenced by Ratnayake and colleagues' finding that whilst 11 academic units of anaesthesia were identified, another 15 centres could at best be described as *potential* academic units as a consequence of their lack of meaningful online presence [3]. Whilst anaesthesia is one of the largest groups on the General Medical Council's Specialist Register, it has one of the lowest numbers of clinical academics, and women and people from ethnic minority backgrounds are comparatively under-represented [3]. These findings may in-part be explained by a lack of visibility that was apparent in Ratnayake's data. As a specialty that is actively engaged in an effort both to increase academic capacity and maintain and celebrate diversity, anaesthesia should be aware of the impact of this lack of visibility. Whilst many anaesthetists are instinctively modest in nature and cautious of self-promotion, acts of conceit and supporting accessibility should not be conflated. With so few academic anaesthetists, it is paramount that those who are interested in a career in academic anaesthesia are able to identify potential mentors, including their research interests, publications and contact details; this is of particular importance amongst those from backgrounds who are under-represented. We therefore applaud Ratnayake's suggestion that individuals and institutions should maintain up-to-date internet biographies, and furthermore suggest that academic anaesthetists should engage with social media as a means to rapidly and accessibly disseminate their findings and enter into dialogue with colleagues [4,25].

If the capacity of UK academic anaesthesia is to increase, the rewards of an academic career must be evident. However, previous research suggests that 'taking an active part in the generation of new knowledge through research' is seldom deemed important in anaesthetists' concepts of professional excellence [26]. This suggests that efforts to increase academic capacity may be hindered by a lack of enthusiasm unless the value of research can be made clear. Perhaps therefore, where the real work is needed is in advocacy, with the aim of changing the culture of anaesthesia in the UK to one that recognises how and why research is fundamental to high-quality patient care, and creates an inclusive academic environment. This is unlikely to be achieved only by increasing the proportion of university affiliated senior academics or trainees in order to achieve parity with other specialties. Instead we must strive to provide opportunities for all colleagues to participate in, and benefit from, academic practice. To maintain a healthy research culture in anaesthesia, we will need to provide access to methodological training, make time available for research activities, foster participation in research design and authorship as well as data collection, and encourage the discussion of research at a local and regional level, for example through journal clubs.

Academic anaesthesia does not belong to the elite, it belongs to all. It falls on all of us to nurture academic anaesthesia, as part of a collective effort to strive for better patient care.

References

1. Feneck RO, Natarajan N, Sebastian R, Naughton C. Decline in research publications from the United Kingdom in anaesthesia journals from 1997 to 2006. *Anaesthesia* 2008; **63**: 270-5
2. Pandit JJ. Anaesthetic research in the United Kingdom: publishing or perishing? *Anaesthesia* 2008; **63**: 225-7.
3. Ratnayake G, El-Boghdadly K, Pandit JJ. An analysis of the academic capacity of anaesthesia in the UK by publication trends and academic units. *Anaesthesia* 2020; [current issue]
4. Bailey CR, Shelton CL. Indexing, metrics, media and Anaesthesia Reports. *Anaesthesia Reports* 2020; **8**: 76-9.
5. The Royal Society. *Research Culture: Embedding Inclusive Excellence*. London; The Royal Society, 2017
6. DORA. 2012. San Francisco Declaration on Research Assessment. Available from: <https://sfdora.org/read/> (accessed 06/09/2020).
7. Wilsdon J, Allen L, Belfore E, et al. *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management*. 2015; doi: 10.13140/RG.2.1.4929.1363.
8. Lopes J, Ranieri V, Lambert T, Pugh C, Barratt H, Fulop NJ, et al. The clinical academic workforce of the future: a cross-sectional study of factors influencing career decision-making among clinical PhD students at two research-intensive UK universities. *BMJ Open* 2017; **7**: e016823.
9. Amare M, McEvoy M, Quay TAW, Smith AF. The Cochrane Anaesthesia Review Group at 20: achievements and challenges in systematic reviews of evidence in peri-operative care. *Anaesthesia* 2020; **75**: 1141-5.
10. Boney O, Bell M, Bell N, et al. Identifying research priorities in anaesthesia and perioperative care: final report of the joint National Institute of Academic Anaesthesia/James Lind Alliance Research Priority Setting Partnership. *BMJ Open* 2015; **5**: e010006.
11. White SM, Griffiths R, Moppett IK. Type of anaesthesia for hip fracture surgery – the problems of trial design. *Anaesthesia* 2012; **67**: 574-8.
12. Shelton CL, Smith AF, Mort M. Opening up the black box: an introduction to qualitative research methods in anaesthesia. *Anaesthesia* 2014; **69**: 270-80
13. Greenhalgh T, Annandale E, Ashcroft R, et al. An open letter to *The BMJ* editors on qualitative research. *BMJ* 2016; **352**: i563

14. Ausserer J, Miller C, Putzer G, Pehböck D, Hamm P, Wenzel V, et al. International publication trends originating from anaesthetic departments from 2001 to 2015. *Anaesthesia* 2017; **72**: 1243-50.\
15. Medical Schools Council. *Clinical Academic Survey*. 2019. Available from: <https://www.medschools.ac.uk/clinical-academic-survey> (accessed 06/09/2020).
16. NHS Digital. *NHS Workforce Statistics – March 2018*. 2018. Available from: <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/nhs-workforce-statistics---march-2018-provisional-statistics> (accessed 06/09/2020).
17. Academy of Medical Sciences. *The tenure-track clinician scientist: a new career pathway to promote recruitment into clinical academic medicine*. London; Academy of Medical Sciences, 2000.
18. Blakemore C, Carney S, Cotterill L, et al. Medically and dentally-qualified academic staff: recommendations for training the researchers and educators of the future. London; Modernising Medical Careers and the UK Clinical Research Collaboration, 2005.
19. Funston G, Cerra C, Kirkham D, Doherty G, O'Neill P. The road to a clinical academic career. *BMJ* 2015; **350**: h786.
20. Ologunde R, Sismey G, Kelley T. The UK academic foundation programmes: are the objectives being met? *Journal of the Royal College of Physicians of Edinburgh* 2018; **48**: 54-61.
21. Pandit JJ. A National Strategy for Academic Anaesthesia. 2005. www.niaa.org.uk/downloads/Academic_full (accessed 20/08/2020)
22. El-Boghdadly K, Docherty AB, Klein AA. Analysis of the distribution and scholarly output from National Institute of Academic Anaesthesia (NIAA) research grants. *Anaesthesia* 2018; **73**: 679-91.
23. Health Services Research Centre. *The Next Five Years Strategy 2017-2022*. London: National Institute for Academic Anaesthesia, 2017.
24. Anonymous. The secret life of an anaesthetist: if surgeons are the blood, we are the brains. 2016. <https://www.theguardian.com/commentisfree/2016/sep/12/secret-life-anaesthetist-surgery-doctor> (accessed 09/09/2020)
25. Johannsson H, Selak T. Dissemination of medical publications on social media – is it the new standard? *Anaesthesia* 2020; **75**: 155-7.
26. Smith AF, Glavin R, Greaves JR. Defining excellence in anaesthesia: the role of personal qualities and practice environment. *British Journal of Anaesthesia* 2011; **106**: 38-43.