Editorial

Protocolised care pathways: a double-edged sword?

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Keywords: Standardisation, Quality improvement, Care pathways, Surgery, Anaesthesia, Perioperative

For those involved in the care and outcomes of emergency surgery in the UK, there are two patient groups which have had increasing scrutiny over the past 20 years: those suffering a hip fracture, and those requiring an emergency laparotomy. In both cases, high-profile reports [1, 2] have led to the creation of national quality improvement programmes which have subsequently become underpinned by financial incentives to drive changes in practice across the National Health Service (NHS). These two pathways were prioritised for multiple good reasons: starting with a hunch from impassioned clinicians that we could do better, leading onto robust data gathering to prove that there was unwarranted variation in practice leading to inequity of outcomes, and evidence that there was potential for care to be improved.

In both cases, the initial rationale for action has been justified. In the case of hip fracture, back in 2003, Roberts and Goldacre [2] highlighted high mortality rates through a retrospective analysis of 30 years of hospital admissions, with no discernible decline in mortality in the preceding 15 years. A joint undertaking between the British Orthopaedic Association and British Geriatrics Society resulted in the publication of the “Blue Book” [3] to provide consensus guidelines on the care of these patients. This led, in 2007, to the launch of the UK National Hip Fracture Database (NHFD) which published their first report in 2009 [4], subsequently broadened to the national falls and fragility fracture audit programme (FFAP) including femoral shaft, distal femoral fractures and periprosthetic femoral fractures. As a national quality improvement project (NQIP) which has benchmarked trusts publicly according to its defined key performance indicators (KPI) [4] the NHFD has seen a year-on-year reduction in mortality and provides trust level data on KPI achievement allowing for targeted improvement projects locally [5].

Following a similar model, in 2011 the Royal College of Surgeons of England and the UK’s Department of Health published a report on the higher risk general surgical patient [1]. This highlighted that the mortality rate associated with emergency non-cardiac surgery in the UK was

two to three-fold higher than that of cardiac surgery, with complication rates of up to 50% [1]. Furthermore, in 2012 Saunders et al [6] published further evidence identifying the variation in mortality among this patient group across the UK. The resulting UK National Emergency Laparotomy Audit (NELA) published its first report in 2015 [7], confirming significant variability in the care provided to patients presenting to hospital for emergency abdominal surgery. The NELA team used a combination of the available evidence along with expert consensus to promote a set of standards to address this, aiming to prioritise key aspects of a patient's admission for both operative and non-operative management. The subsequent implementation of these standards across England and Wales was associated with a reduction in unadjusted 30-day mortality for patients undergoing emergency bowel surgery from 11.8% to 8.7% over 8 years [8]. Patients meeting NELA inclusion criteria now have an established pathway in hospitals in England and Wales, which can streamline their patient journey from admission to theatre, if required, and post operative destination. A key recommendation for high-risk patients, those with predicted mortality >5%, is post operative management in critical care. This recommendation has simplified referral to critical care for these co-morbid patients creating a shared language between clinicians with regard to critical care admission.

Individual hospital KPI reports for both NHFD and NELA are publicly available, benchmarking individual trusts against a national average (https://www.NELA.org.uk & https://www.nhfd.co.uk). Best practice tariffs (BPT) have subsequently been applied to specific NELA and NFHD audit standards, financially motivating a focus on these care pathways [9] in the same way that commissioning for quality and innovation frameworks (CQUINS) and quality and outcomes framework (QOF) points are used to drive change in both NHS Trusts and general practice. As an example, two of the NELA standards, consultant presence in theatre and critical care admission for high-risk patients (those with a predicted mortality >5%), have been previously financially incentivised by BPTs [10]. The 2023-2025 BPT for emergency laparotomy will focus on pre-operative risk assessment and perioperative team involvement in frail patients. Best practice tariffs have also been applied to 7 of the audit standards in the NHFD [9]. BPTs applied to NHFD KPIs have supported the expansion of orthogeriatricians and resulted in an improvement in associated KPIs. However, in a similar timeframe, a decline has been evident in prompt hip fracture surgery, within 36 hours of admission, from 69% in 2017 to 59% in 2022 [5].

The introduction of NELA and NHFD standards are clearly associated with improved morbidity and mortality in the respective patient groups [5, 8]. However, complex interventions in highly interconnected healthcare systems such as UK hospitals are likely to have both predictable and unforeseen consequences. What has yet to be assessed is whether the improvements of NELA and NHFD have incurred any cost to other patient groups or resulted in broader systemic effects. Does having a rigid set of audit standards, supported centrally by best practice tariffs, improve care in the absence of harm? The updated MRC guidance on complex interventions notes that these "may work best if tailored to local circumstances rather than being completely standardised" but is unclear how such tailoring works alongside financial incentives for KPIs [11].

The concept of standardised care pathways for both elective and emergency patients has now spread across the NHS, interfacing with aligned concepts such as enhanced recovery protocols, in attempts to deliver efficient, efficacious, safe care across the population. How though can we ensure that these pathways do not unintentionally exclude, disadvantage, or defund other patient groups?

How might standardised care pathways affect other patients?

All health systems have a degree of resource-constraint, where any investment of money, time, or attention may come at a cost to another area. In the UK NHS, given the complex nature of clinical services, divisional structures, and funding arrangements, it is often not immediately clear how this reallocation of resource affects care. There is a role for economic analysis to explore the cost of care pathway interventions, the economic impact of their adoption, the tariffs associated with them, and the ability of NHS Trusts to fund patient care for all those requiring it in their locality. However, these are not simple calculations, and understanding both the individual and societal economic gain associated with positive clinical and patient-reported outcome metrics can be hard to achieve. The economic analysis of the EPOCH trial – which evaluated a national quality improvement programme to improve survival after emergency abdominal surgery – demonstrates how complex this can be, with different findings on economic viability depending on the temporal window chosen [12].

However, before detailed quantitative studies, such as economic analyses, can be undertaken, a thorough qualitative exploration of the clinical and operational effects of standardised care pathways should first be undertaken. As an example, might there be a delay in access to emergency theatre for non-NELA patient groups who lack a defined care pathway? An extensive literature search supported by a medical librarian did not identify any published work comparing delays in access to emergency surgery when on protocolised pathways versus those who are clinically comparable but not meeting NQIP criteria. Might the non-clinical drivers to prioritisation of NELA patients, such as benchmarking and best practice tariffs, create an unintended disparity in triage of patients presenting for emergency surgery?

Switching focus to the hip fracture pathway, for those trauma patients not meeting inclusion criteria for NHFD [13] is there any delay in surgery due to prioritisation of next day operating for those on the dedicated pathway? Due to common organisational structures of emergency theatre provision, these will often be other orthopaedic cases - prioritisation of any case will inevitably delay another. The resulting delay may have a myriad of consequences, and while these will not often carry the same risk to increase in mortality and morbidity as seen in NFHD patients, the direct and indirect consequences have yet to be recognised and explored. There is evidence from UK major trauma centres (MTCs) that since the creation of the MTC pathways there has been a significant increase in time to theatre for hip fracture patients [14], suggesting delay in certain patient groups due to competing priority pathways.

The impact of delay and/or cancellation in elective surgery is highly topical, given the elective backlog following the SARS CoV2 pandemic and the challenge facing the NHS of addressing this. While an organisational factors study of NELA by Oliver et al [15], and the results of the UK's second Sprint National Anaesthesia Project focussing on the epidemiology of critical care provision after surgery (SNAP-2) [16], explore many reasons for delay or cancellation, the availability of appropriate consultants is not addressed. However, where a consultant surgeon and anaesthetist are mandated to attend out of hours [17] to meet NELA standards, it seems reasonable to suggest that the probability of them being unavailable to work the following day increases, reducing their availability for elective care and resulting in delays to care for other patients. Surprisingly however, exploration of patient cancellations do not often state lack of consultant availability in their analyses [16, 18].

Wong et al [16] have analysed 7-day data collection from SNAP-2 investigating the cancellation of planned operations. They found that 11% of cancellations overall were due to critical care capacity, with the only patient-level predictor of increased likelihood of cancellation being the requirement for post operative critical care (P>0.001). This data supports the statement that critical care capacity is integral to the efficient running of an acute trust, and why admission to a rationed resource should be scrutinised on a case-by-case basis to ensure appropriate utilisation of this resource [19]. The role of prioritised pathways, such as NELA, which mandate critical care admission could be argued to challenge this model, potentially delaying critical care admission for others, with unintended population-level adverse health outcomes. Data from the national Perioperative Quality Improvement Programme (PQIP) [20] indicates that substantial proportions of high-risk patients on elective pathways are still not admitted to critical or enhanced care after surgery. It is possible that the lack of scrutiny of elective pathways when compared to emergency care is placing high-risk elective patients at risk – either of cancellation or triage to the ward rather than critical care.

How do the standards of standardised care pathways translate?

Although it is easy to speculate on the possible proximal effects of care pathways, particularly on other emergency or elective patients in competition for the same resources, distal effects are harder to predict. It would, for example, be interesting to explore the extent to which KPIs that have been demonstrated to have a significant impact in NHFD and NELA have been translated to other patient groups that do not have drivers such as public benchmarking and BPTs. An example of this might be in geriatrician input; both NHFD and NELA reports [5, 8] highlight the role of multidisciplinary input from geriatricians / frailty teams, with Oliver et al [15] identifying geriatric medicine involvement (in patients who are clinically frail or over 80 years old) as an independent association of reduced mortality after an emergency laparotomy. To what extent are these perioperative geriatricians subsequently improving the care of other surgical patient groups? Does their funding allow for this outside of the BPT model? As incentivised pathways create a demand for greater geriatrician input across the perioperative service, are we asking already stretched geriatricians to spread themselves ever more thinly, with a worsening of outcomes in other areas? Certainly, we have yet to see the significant expansion in geriatric medicine which is required if we are to scale up the perioperative joint care model successfully demonstrated by the NHFD, and significant heterogeneity exists in the scope of orthogeriatric involvement outside of the hip fracture pathway.

Pathways such as NELA and NFD may also create subtle changes to the workforce. From an anaesthetic perspective more than 98% of major elective surgery is delivered by consultants and both NELA and NFD work to ensure that emergency patients have access to this same level of care. However, the delivery of high-risk emergency care out of hours represents a major experiential component of both senior registrar and post-CCT fellowship roles. Similarly, many UK centres make good use of highly experienced staff and associate specialist doctors who may be more than capable of managing these cases without the need for consultant input. During elective lists in routine daytime hours, it is easy to see how these senior practitioners can be supported to provide high-quality anaesthesia for major surgery independently while supported by an on-site consultant. However, it is interesting to consider the extent to which both of these pathways might contribute to a growing trend for greater consultant presence out of hours, and what this might ultimately mean for both the clinical experience of those at the end of their training programmes as well as the long-term resilience of the consultant workforce.

A final comment is on the utility of standardisation. Often held on a pedestal by transformation teams, this must be balanced with innovation and individual clinical judgement [21] Standardised care pathways can reduce flexibility and adaptability, reducing the ability to respond to the individual needs of the patient or changing system stresses [22]. Care must be given to ensuring that implementing standardisation in one patient group does not disadvantage patients in another group, who might be in greater need of a constrained resource.

Standards are an important safety net, there to protect patients and reduce inequalities. However, perhaps more attention needs to be paid to the structures which support implementation (for example, the number of critical care beds), as well as the patient-level processes to which standards usually refer (for example, whether an individual high-risk patient goes to postoperative critical care). We highlight that PQIP reports a substantial number of high-risk patients nationally being treated postoperatively on normal wards. However, it also reports that at the national level, there are huge numbers of seemingly 'low-risk' patients who do go to postoperative critical care. It is likely that this discrepancy is related to hospital-level structural resources, which varies between centres, leading to unwarranted variation in thresholds for postoperative critical care admission, particularly in clinical settings which are not audited. Our assertion is that without understanding these system-level resource constraints, standardisation may not address between-centre inequalities, and may in fact lead to different inequalities. The getting it right first time (GIRFT) programme engages with clinicians and managers at Trust and system level, with the aim of reducing unwarranted variation, improving outcomes and maximising efficiency [22]. Although GIRFT is specialty based, cutting across themes such as anaesthesia, perioperative and critical care [24, 25], it provides an opportunity to take a systems-based look at the quality of care. The GIRFT methodology supports spread and adoption of high-quality care through peer support, and covers aspects of both elective and emergency care, may allow for a more nuanced approach to improvement. This ideally should then support local clinicians and managers to seek the resources they need to implement the best possible standards across all patient groups, rather than just the ones which are scrutinised via NQIPs.

Conclusion

The NHS is a resource-limited service, in terms of staffing, finance, morale and infrastructure [26-28]. Those responsible for the development and integration of priority care pathways, based on NQIPs, must be mindful of this, as if there is no expansion in resources, prioritising one area will inevitably disadvantage another. This is in no way to question the clinical utility of these pathways – they have shown genuine patient benefit – but to call for a nuanced systems understanding of their effects both as individual pathways but also as more general concepts in healthcare. We flag here the concern that the rigid implementation of audit standards driven by short term financial gain (BPTs), while not increasing resource or addressing waste within the system may risk unforeseen and unanticipated consequences with both proximal and distal system effects. Introduction of new standards and incentives should not just be accompanied by quality improvement efforts in that area, but also by a system-wide evaluation of what would be needed to provide that improvement in care quality, without disadvantaging others. A good example of where this has happened is in the provision of orthogeriatric services, but this expansion in structures to support high quality care for all is certainly not a universal consequence of new BPTs or protocolised pathways. Systems approaches to healthcare provide a pragmatic and academic perspective to avoiding unforeseen consequences of well-intentioned quality initiatives [29]; these should include balancing the benefits of standardised

care pathways in one area with the risks to others – but are currently lacking in published literature.

Declarations / Funding

SRM is National Clinical Director for Perioperative and Critical care at NHS England. In that role, she is a member of the Project Board for the National Emergency Laparotomy Audit (NELA); she was previously a member of the NELA project team (2014-2022). She is supported by the University College London Hospitals National Institute for Health Research (NIHR) Biomedical Research Centre where she is theme lead for Critical and perioperative Care and the Central London NIHR Patient Safety Research Collaboration, of which she is Director. The views expressed in this article are those of the authors and not necessarily those of NHSE, the NIHR or the Department of Health and Social Care.

ER and TB have no external funding or competing interests declared

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