

Physician extenders on surgical services: the need for a systems perspective

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SUMMARY

Adding physician extenders (PEs) to surgical teams has the potential to affect care delivery in multiple ways. To develop evidence-based recommendations on integrating PEs into surgical teams, we must recognize that patient care is a complex, adaptive system and requires a health systems perspective to understand how changes will affect outcomes. It is the best method of assessing the system adaptations and trade-offs of adding PEs prior to implementation. Such work would help to optimize research and management of limited health care resources.

The August 2017 issue of *CJS* included a systematic review by Johal and Dodd¹ on the effects of integrating physician extenders (PEs) into surgical teams. The authors found that the overall quality and level of evidence was low. With only 1 level-1 and 1 level-2 study meeting inclusion criteria, they concluded that there is a need for further high-quality studies on the topic. We agree that further research is needed, but would argue that to effectively evaluate the outcomes of PEs, we need research from a health systems perspective. Using a health systems perspective means viewing an issue as a single element involved in an interactive network of agents that operate for a greater purpose related to health.² This would enable researchers to understand how PEs might interact within the complex dynamics of the surgical team to affect patient care.

Physician extenders are likely to have multiple direct and indirect effects on patient outcomes and health care costs. These outcomes depend heavily on how PEs interact within the complex and adaptive workings of the surgical team. For instance, it may be most effective for a PE to facilitate multidisciplinary discharge meetings compared to replacing a resident during call shifts overnight. Most likely the ideal role would change over time and evolve with service demands. Similarly, the roles of the other professionals differ greatly among institutions and surgical services. Some institutions have nursing leaders, community care coordinators and fellows, whereas others have only a surgeon and front-line nurses. As such, a particular PE role will not necessarily fit all teams.

As mentioned by Johal and Dodd,¹ there is little evidence to guide practitioners on integrating PEs into surgical teams. We often have extensive evidence to guide the use of new therapies and diagnostic tests, but little research guiding transformations in interprofessional care. For surgical practice, we often consider the acme of clinical research to be systematic review of large, multicentre randomized controlled trials (RCTs) in which patient populations are standardized and variability in health systems are controlled to assess direct, linear associations between an intervention and patient outcomes. However, to evaluate the effect of integrating PEs, we need to use other research methodologies for 2 main reasons. First, the work of a PE is so deeply engrained in the unique complexities of a health care team, hospital

and health system that isolating one aspect of their role in a multicentre RCT would not provide results that represent their overall effect. For instance, the only level-1 evidence identified was a trial by Tranmer and Parry,³ which looked at patient satisfaction and quality of life after receiving a telephone call from an advanced practice nurse two weeks after discharge versus usual care. This was effective at evaluating telephone follow-up, but failed to capture the overall effect of having a PE on the care team. Conducting an RCT to assess each isolated role of PEs is not only cumbersome, but also would fail to capture the interrelated outcomes that work to create the overall health system impact. Second, surgical team structures are diverse, and incorporating the differing roles and adaptations of the team members is integral to understanding how a PE could be added. There is increasing evidence that the health care system is a complex, adaptive learning system.⁴ The limited metrics of trials would not be able to capture such evolutions of workflow processes that would occur in response to integrating PEs. Furthermore, attempting to develop case and control populations to represent each different type of team structure would be impractical and would likely produce results that are oversimplified, underpowered and irrelevant to the reality of practice.

Instead, approaches such as system dynamics modelling may provide a more efficient means of understanding PE integration in a surgical team and its possible health system impacts. System dynamics modelling involves first understanding and then mapping the health system interrelationships involved in a problem to predict outcomes, resource needs and system trade-offs. This could enable researchers to evaluate different approaches to PE integration and to better understand potential benefits as well as conceptualize possible unintended consequences or system trade-offs of different surgical workflows. This modelling approach has long been used in business and is now gaining traction in health care, particularly in public health,

where it is used to project health outcomes and inform health policy development.⁵ By applying system dynamics modelling to the question of PE integration, the interactions of PEs with patients and other providers could be assessed for unnecessary redundancies or unintended consequences, and adjustments could be made before implementation. This may support more effective implementation of PEs to improve patient outcomes.

Surgical care is becoming increasingly complex, and health care resources are limited. We must leverage health systems research approaches to develop evidence-based models of care that can be assessed for implementation. The integration of PEs is an excellent example of an issue where using a health systems modelling approach could help optimize health system investments to improve patient outcomes.

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