

The Need for a Global Perspective on Task-Sharing in Anesthesia

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Worldwide, patients are suffering due to a critical shortage of anesthesia providers. Five billion people lack access to safe surgical and anesthesia care with 143 million surgical procedures not performed each year due to inadequate access to care.¹ A large proportion (approximately one third) of the global burden of disease requires surgical and anesthesia services, yet many countries have < 1 anesthesia provider per 100,000 or even per million citizens. By comparison, in the United States, there is 1 anesthesia provider per 4300 citizens. How best to rectify this global anesthesia workforce crisis is a challenge that needs urgent, productive dialogue and action, especially by the anesthesiology community. It cannot be left to happenstance, to whimsical government decisions, or to non-anesthesiologists alone. Furthermore, it cannot be left in the hands of individuals or organizations that ignore the global perspective and either categorically oppose independent nonanesthesiologist provision of care or demand complete nonanesthesiologist autonomy as the optimal strategy for increasing access to safe anesthesia care worldwide.

Task-sharing is widely utilized to expand access to care and address workforce shortages for many disciplines, including anesthesia, primary care (eg, community health workers), obstetrics (eg, midwives), and surgery (eg, physicians' assistants). However, the topic of task-sharing in anesthesia is arguably more complex than for other disciplines primarily for 2 reasons: (1) the relative shortage of physician anesthesia providers in many low- and middle-income countries (LMICs) is orders of magnitude worse than for other specialties; and (2) anesthesia is perhaps the only specialty where formal, nonphysician cadres practice in some settings with full scope of practice. The former

makes task-sharing all the more important and the latter factor makes task-sharing more contentious.

For the purposes of this article, we use the word "anesthesiologist" to mean a graduate of a medical school who has undergone a period of postgraduate clinical training in an accredited anesthesia education program with documentation of training and the ability for independent practice. A nurse anesthetist is a graduate of nursing school who has completed an accredited clinical anesthesia training program. In the United States, a certified registered nurse anesthetist (CRNA) has completed a Bachelor's degree in nursing (or other appropriate degree), holds a Registered Nurse licensure, and has had a minimum of 1 year of critical care experience. We define an anesthetic assistant, an anesthetic/clinical officer, or an anesthesia technician as a health care provider with a varied background who has undergone clinical anesthesia training. For the purposes of this article, we use the term nonphysician anesthesia provider (NPAP) to collectively describe all nonphysician providers.

Current models of anesthesia care delivery worldwide include anesthesiologists working alone, anesthesiologists supervising NPAPs (care team), NPAPs working independently, and surgery providers performing surgery while concurrently administering some form of anesthesia. In many countries worldwide, it is also common practice for physicians with little or no formal anesthesia training to administer anesthetics. Due to the massive global anesthesia workforce shortage and inequitable access to surgical and anesthesia services in low-, middle-, and high-income countries, the fact of the matter is that a universal model based on service provision by a single-handed anesthesiologist is untenable.^{2,3} The duration and cost of anesthesiologist training, coupled with limited existing training capacity worldwide, prohibit sufficient scale-up of anesthesiologists to meet growing global needs. The only globally viable model is a flexible, team-based approach that includes both anesthesiologists and nonanesthesiologist providers.

THERE IS NO ROOM FOR POLARIZED VIEWS

The contentious debate over the role of NPAPs has recently resurfaced in the context of proposed legislative changes in the US Veterans Affairs' system and was also the focus of a recent paper evaluating independent CRNA practice in the United States published in *Anesthesia & Analgesia*.⁴ This topic was also discussed at several venues of the recent World Congress of Anaesthesiologists 2016 in Hong Kong. Polarized views, including the sometimes categorical stance against independent NPAP practice in some high-income

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country settings, may have unintended, negative consequences in LMIC. Opponents of independent NPAP practice assert that the absence of direct anesthesiologist involvement results in a lower standard of care and puts patient lives at risk.^{5,6} They also argue that independent NPAP practice may not increase access to care. Instead they advocate for an anesthesiologist-led, team approach where medical expertise as well as subspecialty training (such as pain and critical care) can help provide the full spectrum of perioperative care. Proponents of independent NPAP practice argue that NPAPs can provide safe, high-quality anesthesia care without anesthesiologist oversight and in doing so decrease costs and increase access to anesthesia and surgical services.⁷ Both sides acknowledge job security, salary, and medicolegal liability among many additional issues fueling the debate. Regardless of which side of the debate one argues, it cannot be disputed that patients globally are suffering as a result of a critical shortage of anesthesia providers, especially in LMICs. There is validity to arguments made by both sides in this debate. However, global generalizability of these arguments is lacking. A model that works in 1 setting may be inappropriate and inefficient if implemented elsewhere. Extreme and entrenched views on the role of NPAPs divide the global anesthesia community and influence the tenor of the discussion in many countries.

MORE EVIDENCE IS NEEDED TO INFORM POLICY AND PRACTICE

More evidence and less rhetoric are needed to inform policy on the optimal role of NPAPs in different practice settings. Only in recent years have we begun to better understand and quantify global disparities in surgical, anesthesia, and pain management, yet robust data are lacking to support or refute many of the claims by both sides of the independent NPAP argument. In the United States, 17 states have exercised the 2001 federal law to “opt out” of the Centers for Medicare & Medicaid Services requirement that physicians supervise CRNAs. Among these 17 states, 14 still require some level of physician oversight and only 3 allow completely independent nurse anesthetist practice. Only a relatively small number of studies has evaluated the impact of the “opt out” effects on safety, cost, and access to care, all with limited conclusions.⁸⁻¹¹ Virtually no studies have rigorously examined safety, quality, and efficacy of the large number of heterogeneous NPAP models in existence, especially those in LMICs. Although complex, further evaluation of outcomes associated with different models and different cadres of providers is critical to help guide health system design as well as training requirements for various levels of NPAPs. Evaluation of program costs and impact on access to care will also be essential for informing policy and shaping the design of future health systems. Such evaluations need not wait for the implementation of new programs or changes in practice but can begin immediately by evaluating the numerous, heterogeneous models already in existence. Innovation and evaluation of different care models must be a top research and policy priority for the global anesthesia community to increase access to safe anesthesia care.

POLICIES MUST BE TAILORED AT THE LOCAL LEVEL

Nonphysician anesthesia providers currently play a large role in operating room care worldwide. In many low-income countries, these practitioners provide the vast majority of anesthesia care. For example, in Uganda approximately 400 anesthetic officers (AOs) provide the majority of anesthesia care compared with only 60 anesthesiologists. Most AOs work in hospitals that do not employ anesthesiologists, primarily because so few are available (approximately 60 anesthesiologists in the country). If policy were to dictate that AOs are not allowed to practice independently, the majority of surgical cases and anesthesia services in Uganda, and similar settings, would simply not occur. Conversely, a policy that dictates complete independence for AOs would diminish the hopes of scaling up perioperative services in Uganda for the full spectrum of care, including American Society of Anesthesiologists 1-5E cases, pre- and postoperative care as well as critical care and pain services. Such a model would also continue to leave many AOs isolated with limited opportunity for clinical support, career development, and continuing medical education. These challenges are common in many LMICs and pose a significant obstacle to scaling existing independent NPAP models. One recent analysis of surgical task-sharing in Uganda found many of these same issues but also highlighted the need for informed policy to guide effective implementation of task-sharing.¹² Like many low-income countries, Uganda has few if any formal policies on task-sharing despite decades of implementation as a mainstay of the health care system.¹³

Policies, guidelines, and standard operating procedures as well as accreditation for the provision of anesthesia should be locally derived and consistent with nationally and internationally accepted standards.¹⁴ It is imperative that LMIC provider perspectives and evidence from LMICs also be included in international policymaking efforts. Local policy and guideline committee activity should be anesthesiologist-led and should include all relevant cadres of providers as well as hospital leadership. In some LMICs, anesthesiologists may not be physically present in the hospital or clinic. In such circumstances, this could be overcome by the creation of national policies, guidelines, and standard operating procedures that are consistent with international guidelines and that are then implemented without modification in all hospitals providing surgical services. In regions or facilities where anesthesiologists are more plentiful, local modifications within the bounds set by national policies and procedures would be acceptable.

POLICIES SHOULD EMPHASIZE A FLEXIBLE, TEAM-BASED APPROACH THAT BEGINS AT THE TIME OF TRAINING

Rather than arguing for either complete independence or mandated supervision, we advocate for a flexible, team-based approach that optimizes care based on patient risk factors, team resources, expertise, and other limitations at the local level. This is not a novel model but one that is successfully utilized by many disciplines, including anesthesia in several countries.^{15,16}

The team approach utilizes physician anesthesiologists blended with NPAPs, some of whom may practice without direct, on-site anesthesiologist supervision to maximize utility for patients and available resources. The NPAP component of the team may be comprised of multiple cadres with scopes of practice tailored to their varying levels of training. The team design would be optimized by each country for the local circumstance, nationally or regionally. We believe strongly that the education and clinical training of all anesthesia providers should be overseen in an integrated fashion rather than in educational silos as is currently the case. The intent is not to make 1 group subservient to another but to emphasize team integration and communication as fundamental from the beginning of training. While most high-income countries already have national curricula in place, most LMICs do not. This creates the opportunity to develop a set of multinational training standards for LMICs that can be modified according to local needs. While the International Federation of Nurse Anesthetists has published standards for practice and education for nurse anesthetists, there is need to define standards for the many other cadres of anesthesia providers worldwide. An organization such as the World Federation of Societies of Anaesthesiologists is ideally placed to lead such a multinational and multidisciplinary initiative.

PHYSICIANS SHOULD LEAD EFFORTS AND PROMOTE HARMONIZATION WITH NPAPs

Anesthesiologists must invest more in leading the design, evaluation, and implementation of task-sharing models that expand access to care. Strong management and good relationships among health care workers are 2 essential components for successful task-sharing models, as recognized by the World Health Organization and numerous longstanding task-sharing initiatives.^{15,17} As such, anesthesiologists should also take the lead in promoting harmonization with and among NPAPs worldwide. As a first step, we must create venues for productive dialogue among different cadres of anesthesia providers worldwide to better understand local needs, successes, and failures. Without effective leadership and harmonization, the global anesthesia community will not succeed in developing better models for anesthesia care.

CONCLUSIONS

In order to increase access to safe, high-quality surgical and anesthesia services worldwide, the global anesthesia workforce must be scaled up relatively quickly. As such, task-sharing will play a critical role, especially in LMICs. There are many models for anesthesia practice and training and many more opinions on the best approach. In numerous settings around the world, NPAPs must practice without direct, on-site physician supervision to maximize utility for patients. We assert that this can be done safely through improved implementation of international standards for anesthesia training and practice as well as a flexible, physician-led, team-based approach to care. In locations where physician numbers limit on-site or local leadership, such direction should be derived at the national or regional level. The time has come to abandon polarized views, to seek

more data, and to actively work across cadres to promote safe anesthesia practice standards that account for the heterogeneous needs of different health systems around the world. ■■

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REFERENCES

1. Funk LM, Weiser TG, Berry WR, et al. Global operating theatre distribution and pulse oximetry supply: an estimation from reported data. *Lancet*. 2010;376:1055–1061.
2. Bergström S, McPake B, Pereira C, Dovlo D. Workforce innovations to expand the capacity for surgical services. In: Debas HT, Donkor P, Gawande A, Jamison DT, Kruk ME, Mock CN, eds. *Essential Surgery: Disease Control Priorities, Third Edition. Volume 1*. Washington, DC: The International Bank for Reconstruction and Development/The World Bank; 2015. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK333504/>. Accessed October 4, 2016.
3. Holmer H, Shrimel MG, Riesel JN, Meara JG, Hagander L. Towards closing the gap of the global surgeon, anaesthesiologist, and obstetrician workforce: thresholds and projections towards 2030. *Lancet Lond Engl*. 2015;385(Suppl 2):S40.
4. Sun E, Dexter F, Miller TR. The effect of 'opt-out' regulation on access to surgical care for urgent cases in the United States: evidence from the National Inpatient Sample. *Anesth Analg*. 2016;122:1983–1991.
5. American Society of Anesthesiologists. *Physician Anesthesiologists Oppose Legislation Risking Veterans' Lives*. Available at: <http://www.asahq.org/about-asa/newsroom/news-releases/2015/11/legislation-risking-veterans>. Accessed December 16, 2015.
6. Petzel R. *Letter from 66 State Medical and Specialty Societies to VA: Re: Veterans Health Affairs Nursing Handbook 1180.03*. Available at: <http://origin.library.constantcontact.com/download/get/file/1102302027281-361/2013+10+AMA+Letter+to+VHA++CTA+1.7.14.pdf>. Accessed December 16, 2015.
7. *Five Things You Should Know About the VA's Proposed Rule to Better Utilize APRNs in VA Hospitals*. Available at: <http://www.aana.com/newsandjournal/News/Pages/070616-5-Things-You-Should-Know-About-the-VAs-Proposed-Rule.aspx>. Accessed October 4, 2016.
8. Lewis SR, Nicholson A, Smith AF, Alderson P. Physician anaesthetists versus non-physician providers of anaesthesia for surgical patients. *Cochrane Database Syst Rev*. 2014;7:CD010357.
9. Pine M, Holt KD, Lou YB. Surgical mortality and type of anesthesia provider. *AANA J*. 2003;71:109–116.
10. Smith AF, Kane M, Milne R. Comparative effectiveness and safety of physician and nurse anaesthetists: a narrative systematic review. *Br J Anaesth*. 2004;93:540–545.
11. Abenstein JP, Warner MA. Anesthesia providers, patient outcomes, and costs. *Anesth Analg*. 1996;82:1273–1283.

12. Galukande M, Kaggwa S, Sekimpi P, et al. Use of surgical task shifting to scale up essential surgical services: a feasibility analysis at facility level in Uganda. *BMC Health Serv Res.* 2013;13:292.
13. Baine SO, Kasangaki A. A scoping study on task shifting; the case of Uganda. *BMC Health Serv Res.* 2014;14:184.
14. Merry AF, Cooper JB, Soyannwo O, Wilson IH, Eichhorn JH. International standards for a safe practice of anesthesia 2010. *Can J Anaesth.* 2010;57:1027–1034.
15. Gisvold SE, Raeder J, Jyssum T, et al. Guidelines for the practice of anesthesia in Norway. *Acta Anaesthesiol Scand.* 2002;46:942–946.
16. Meeusen V, van Zundert A, Hoekman J, Kumar C, Rawal N, Knape H. Composition of the anaesthesia team: a European survey. *Eur J Anaesthesiol.* 2010;27:773–779.
17. Campbell C, Scott K. Retreat from Alma Ata? The WHO's report on Task Shifting to community health workers for AIDS care in poor countries. *Glob Public Health.* 2011;6:125–138.