

The Role of Young Neurosurgeons in Global Surgery: A Unified Voice for Health Care Equity

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Health care equity pursues the elimination of health disparities or inequalities. One of the most significant challenges is the inequality shaped by policies, for which systemic change is needed. Historically, non-surgical pathologies have received greater political priority than surgical pathologies, but we have begun to see a paradigm shift over the past decade. In 2010, Shrimme et al. showed that 32.9% of all global deaths were attributed to surgically related conditions, which equated to three times more deaths than that due to non-surgical pathologies such as tuberculosis, malaria, and HIV/AIDS combined (1). When the Lancet Commission on Global Surgery was published in 2015 (2), a new era in global health emerged. The message was clear: surgical diseases could no longer be neglected. The report emphasized the importance of systems-level improvements in service delivery, workforce training, financing, information management, infrastructure, health policy, and governance.

In neurosurgery, over five million patients present with treatable conditions each year but do not have access to surgical intervention (3). Most of these patients live in low- and middle-income countries (LMICs), particularly in Africa and South-East Asia. For a hospital to offer neurosurgical services, substantial investment in infrastructure and human resources is required. Hence, most neurosurgical services tend to be concentrated in tertiary hospitals or academic centers located in cities or urban regions. Moreover, the comprehensive management of a patient's neurosurgical disease relies heavily on a functioning health care system, often requiring a multidisciplinary team approach, whether in children or adults.

Figure 1 illustrates the different barriers that a patient may encounter when trying to access neurosurgical care. When the workforce deficit is significant, when there are gaps in the referral system, and when infrastructure and resources are inadequate to meet the community's needs, neurosurgical patients will continue to get lost to follow-up or present as acute neurologic emergencies, resulting in significant morbidity and mortality.

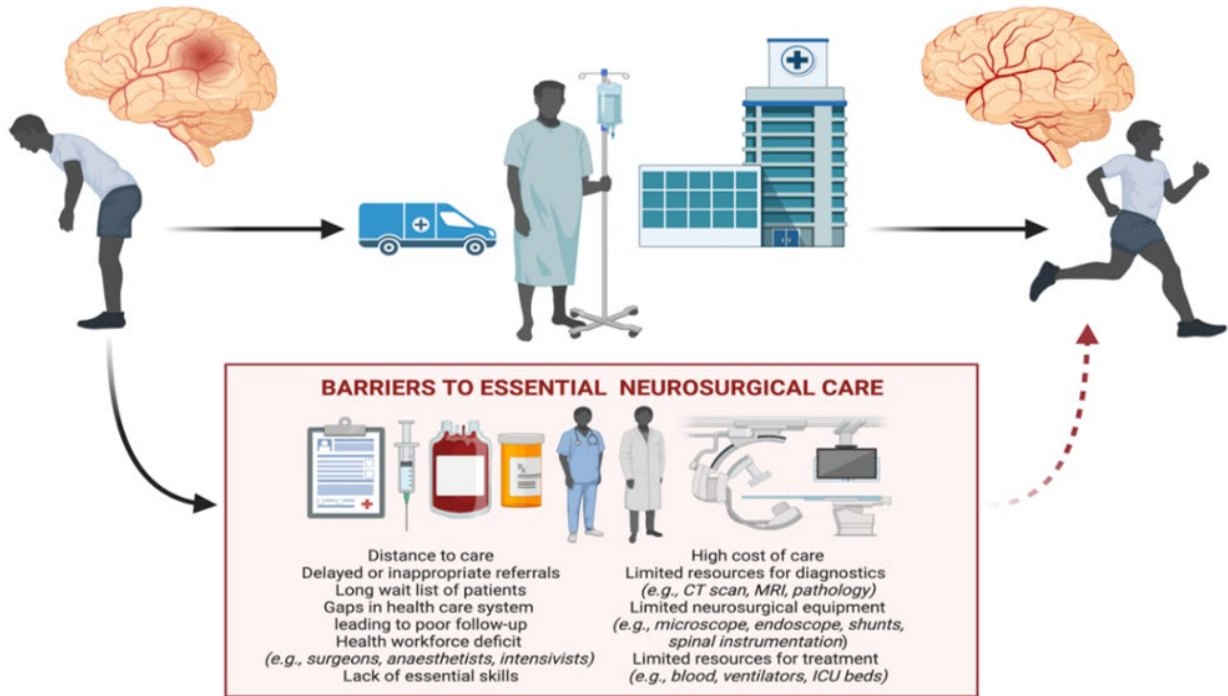


FIGURE 1. A neurosurgical patient may encounter several barriers in accessing essential neurosurgical care. Unaddressed, these barriers lead to preventable deaths or preclude full recovery of function. Image created in BioRender.com.

What is the role of young neurosurgeons in surmounting these barriers today in every country of the world?

Beyond acquiring the knowledge, skills, and grit demanded by the practice of neurosurgery, young neurosurgeons must advocate for access to safe, timely, and affordable neurosurgical care for their patients (4). The reality is that in many regions of the world, the surgical theatre remains inaccessible to most patients who need them.

On average, there is just one operating theatre for every 100,000 people in West-Sub Saharan Africa, compared with 14 theatres per 100,000 people in high-income countries (HICs) (5). While there exists a capacity surplus of neurosurgeons in Europe and North America, over 19,000 additional trained neurosurgeons are needed in Africa and South-East Asia combined (3). The average waiting period for elective and semi-elective neurosurgical procedures around the world remains largely unknown, especially in LMICs.

To better quantify the extent of investment needed in health system strengthening, the Lancet Commission on Global Surgery identified core indicators to reflect the state of patient access to safe, timely, and affordable surgery and anesthetic care in each country. As members of the Young Neurosurgeons Forum of the World Federation of Neurosurgical Societies (WFNS-YNF), we have adapted the global targets, focusing on the care of neurosurgical patients and enumerating the potential roles of young neurosurgeons toward the attainment of these goals (See Table 1). It has become essential to appreciate that we live in a global community and no longer live independently in our silos. The potential to have a positive impact on many lives exists beyond the confines of the operating theatre. Young neurosurgeons must have a good grasp of health care systems—what makes them succeed, what makes them fail—and this may entail pursuing further studies or actively seeking mentorship from public health experts and people on the ground.

As young neurosurgeons, our strength is embedded in our ability to network and collaborate, primarily attributed to growing up with technology at our fingertips. Combined with a fresh perspective, a positive outlook, and a healthy awareness of one's limitations, this makes it possible to have significant influence at a global level among peers, stakeholders, and policymakers. We are restless, tenacious, and persistent. We question, innovate, and disrupt for the better. The WFNS-YNF is intensely interested in supporting and developing the next generation of neurosurgeons worldwide. Please reach out to the corresponding author or visit <https://youngneurosurg.org> for comments or suggestions on how you can assist us and how we can help you grow. Together, let us work within our diverse health care systems towards a common goal of health equity for all neurosurgical patients regardless of a demographic region.

T A B L E 1. WFNS Young Neurosurgeons Committee adaptation of the Lancet Commission on Global Surgery core indicators for monitoring universal access to safe, affordable surgical and anesthesia care.

Core Surgical Indicators and Definitions*	Adapted Targets for Neurosurgery*	Role of Young Neurosurgeons
<p>Access to timely surgery</p> <ul style="list-style-type: none"> The proportion of the population that can access, within 2 hours, a facility that can perform craniotomy for evacuation of hematoma and shunting for hydrocephalus. 	<p>A minimum of 80% coverage of essential neurosurgical services per country by 2030, with a focus on:</p> <ul style="list-style-type: none"> Traumatic brain injury Hydrocephalus Tumors Cerebrovascular disease 	<ul style="list-style-type: none"> Explore the use of social media apps (e.g., WhatsApp) to facilitate referral of emergent and urgent cases from remote areas. Harness technology (e.g., drones) for rapid transport and delivery of essential needs such as medications, blood, and shunts Develop telemedicine units to facilitate referral of elective cases and follow up care. Train physicians who may participate in task-shifting and/or task-sharing for life-saving neurosurgical procedures
<p>Specialist surgical workforce density</p> <ul style="list-style-type: none"> Number of trained neurosurgeons who are working, per 100,000 population 	<p>100% of countries with at least one neurosurgeon per 100,000 population by 2030</p>	<ul style="list-style-type: none"> Form partnerships between HICs-LMICs and LMICs-LMICs for collaboration, training, and capacity-building in neurosurgery Conduct webinars and videoconferences to educate through lectures, journal clubs, and demonstration of operative techniques. Create a database of training opportunities, both local and international, with links to program directors Organize the local group of trainees and young neurosurgeons for sharing of knowledge, resources, and experiences, as well as providing peer support to encourage workforce retention
<p>Surgical volume</p> <ul style="list-style-type: none"> Neurosurgical procedures are done in an operating theatre, per 100,000 population per year 	<p>80% of countries by 2020 and 100% of countries by 2030 tracking neurosurgical volume</p>	<ul style="list-style-type: none"> Fast-track the adaptation and use of electronic medical records, with emphasis on essential neurosurgical procedures. Establish a network with colleagues in neighboring countries for the collection of regional data
<p>Perioperative mortality</p> <ul style="list-style-type: none"> All-cause death rate before discharge in patients who have undergone a neurosurgical procedure in an operating theatre, divided by the total number of procedures, presented as a percentage 	<p>80% of countries by 2020 and 100% of countries by 2030 tracking perioperative mortality and, if possible, outcomes (e.g., using the Glasgow Outcome Scale)</p>	<ul style="list-style-type: none"> Conduct and/or participate in regular morbidity and mortality conferences, encompassing the entire perioperative period (pre-op, intra-operative, and postoperative until 30 days after surgery) Initiate research and conduct quality-improvement projects to decrease perioperative morbidity and mortality and improve neurologic outcomes after neurosurgery. Establish a referral network with international centers to discuss the management of complex cases. Train primary care physicians on detection of early and late postoperative complications
<p>Protection against impoverishing or catastrophic expenditure</p> <ul style="list-style-type: none"> The proportion of households protected against impoverishment and catastrophic expenditure from direct out-of-pocket payments for neurosurgical care, including the cost of implants and devices (e.g., shunts, spinal instrumentation) 	<p>100% protection against impoverishment and catastrophic expenditure from out-of-pocket expenses for neurosurgical care by 2030</p>	<ul style="list-style-type: none"> Engage with politicians, policymakers, and stakeholders to increase health spending for high-burden neurosurgical conditions. Lobby for laws and preventive measures (e.g., folate supplementation, use of helmets) to decrease the burden of acquired neurosurgical diseases. Work with non-government organizations and use social media to increase awareness on neurosurgical conditions, as well as generate funding for patients in need

*Adapted from JG Meara et al. (2).

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