

Global Neurosurgery: A call to Action

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Abbreviations

LMIC's: low and middle-income countries.

NGOs, nongovernmental organization.

GNC: Global Neurosurgery Committee.

WFNS: World Federation of Neurosurgical

Societies Disparities in surgical care often do not receive the same attention and resources as those in medical care, and only as recently as 2015 was surgery established as a global health priority.

When it comes to surgical subspecialties such as neurological surgery, access to care goes from being a disparity to a complete absence in many cases as access to neurosurgical care is no longer a right but a luxury. To address this need multiple organizations have worked to improve access to neurosurgery, and as global neurosurgical efforts expand a concerted effort is necessary to ensure safe, sustainable and equitable care is provided and efforts by the multiple stakeholders are not duplicated. To that end, the Global Neurosurgery Committee (GNC) of the World Federation of Neurosurgical Societies (WFNS) created an action plan for directed collaboration. We introduce the GNC Action Plan here and describe its guiding principles, divided into five objectives that encompass the necessary steps to achieve universal access to neurosurgical care: 1) amplifying access to neurosurgical care, 2) aligning global neurosurgery activities, 3) advancing global neurosurgery research efforts, 4) assimilating neurosurgical capacity building into surgical systems, and 5) advocating for neurosurgical care within Universal Health Coverage.

1 | INTRODUCTION

Global health organizations have highlighted the inequalities that exist in health services around the globe. Although the disparities in medical care are real, the differences in surgical care are often more significant but do not receive the same attention and resources, and only as recently as 2015 was surgery established as a global health priority. That year, the Lancet Commission released their Global Surgery 2030 instrumental report on the tremendous lack of surgical care globally and the need for a focus on addressing this issue: 5 billion people do not have access to safe and affordable surgical and anesthetic care, 143 million additional surgeries are needed each year, and 33 million people face catastrophic health expenditure each year due to payments for such care (1).

When it comes to surgical subspecialties such as neurological surgery, access to care goes from being a disparity to a complete absence in some cases. Large areas of the world, especially in low and middle-income countries (LMIC's), suffer ratios of one neurosurgeon for every 10 million people, in which case access to neurosurgical care is no longer a right but a luxury (2). Multiple individuals, academic institutions, nongovernmental organizations (NGOs), and government agencies have improved access to safe surgical and anesthetic care to address this need. Many of these efforts have been successful, with academic institutions developing partnerships with local hospitals such as Duke University with the Mulago National Referral Hospital in Uganda (3) and the Weill Cornell Tanzania Neurosurgery Project (4). NGOs are helping to provide neurosurgical care, such as the CURE Children's Hospital of Uganda (3) and the Virtue Foundation in Mongolia (5). However, as global neurosurgical efforts continue to expand, a concerted effort is needed to ensure safe, sustainable, and equitable care is provided and efforts by the multiple stakeholders are not duplicated. To that end, the Global Neurosurgery Committee (GNC) of the World Federation of Neurosurgical Societies (WFNS) created an action plan to address this need for directed collaboration.

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2 | AMPLIFY ACCESS TO NEUROSURGICAL CARE

The first step in addressing the need for universal access to safe, affordable, and equitable neurosurgical care worldwide is to define the current resources and needs. Research efforts both globally and in individual communities are needed to provide the necessary data. The GNC of the WFNS is actively involved in studies to determine the global neurosurgical workforce, broken down by country-specific numbers and markers, to determine where the greatest need is and direct further efforts to address those needs. However, knowing the density of neurosurgeons in a country is only one step, as educational programs are needed to train more neurosurgeons. Studies of the distribution of training centers worldwide but the barriers to access to training are currently underway. Once enough neurosurgeons have been trained, there remains the issue of limited resources and the need for proper neurosurgical equipment that is both suitable and sustainable in varying LMIC's. Programs like the WFNS Foundation Neurosurgical Equipment Support seek to provide neurosurgeons in LMIC's with donated equipment that they would not otherwise be able to afford. To ascertain the suitability and sustainability of such equipment in LMIC's settings and the effectiveness of such equipment donation programs, the GNC is currently analyzing the WFNS program. Lastly, the harms of catastrophic health expenditures by patients for essential neurosurgical procedures can outweigh the benefits of surgery, and so out-of-pocket costs to patients for neurosurgical procedures in every country must be determined to advocate for financial risk protection.

3 | ALIGN GLOBAL NEUROSURGERY ACTIVITY

Aligning global neurosurgery activity first requires communication by all stakeholders. To this end, the GNC Action Plan calls for creating a communication platform, reporting and disseminating information and matching needs and opportunities, and fostering collaboration. Such a platform, InterSurgeon (<https://intersurgeon.org/>), has been created and is free of charge for all users to create an equitable ground for members. By utilizing this platform, stakeholders in high-income countries (HIC's) and LMIC's can develop partnerships more and expand their collaborations. Because global neurosurgery does not exist separate from global surgery and global health, it is vital that these collaboration efforts extend beyond the neurosurgical community. Once stakeholders can come to a common table, education must be tackled. A coordination mechanism must be developed for the neurosurgeon's training, particularly in LMIC's with the most significant deficit. Finally, and perhaps firstly, the global neurosurgical community agreed upon and adopted a neurosurgery action plan such as the one we describe here.

4 | ADVANCE RESEARCH EFFORTS

Research is an integral part of global neurosurgery. It can guide policy, support training, and promote new ideas. Additionally, and more specifically in the developing world, research informs the public on disease trends, interventions, outcomes, and potential barriers to quality, safe, accessible, and affordable care. The GNC Action Plan aims to advance relevant research, especially in the developing world, through a few target initiatives:

- "Mapping research output by region and themes helps understand the landscape of research productivity; this can serve as a foundational starting point when conceptualizing the current status of global neurosurgery in LMIC's.
- Establishing a global neurosurgery research grant or award mechanism highlights and incentivizes the work in LMIC's by contributors. Leveraging the promotional power of the WFNS, this recognition for superior research justly and equitably includes contributors from LMIC's and HIC's.
- Major neurosurgery journals are key repositories for the latest and most novel research in the field. By advocating for global neurosurgery sections in these major journals, significant research from the developing world gets a premium platform to educate and inform readers from all over the world.
- Through the Program in Global Surgery and Social Change, the Global Neurosurgery Initiative (GNI) actively trains future leaders in the public health practice of global neurosurgery. However, GNI fellows and research associates are individually responsible for securing funding mechanisms during their year to two-year-long tenure; this potentially limits the pool of candidates – especially ones from LMIC's. This financial barrier to education is a common problem for those in LMIC's seeking training. To address this issue, establishing funding mechanisms through key partners will be pivotal in developing the next generation of leaders in global neurosurgery.
- The physical or virtual meeting space for the leaders in neurosurgery routinely happens at major meetings. Including global neurosurgery sessions in these major meetings provides the space for developing world research to be displayed, discussed, and advanced by the leading minds in the field.
- Authorship equity in research from LMIC's is critically important. Where experiences and resources may make the study, development, writing, and submission of research seamless for HIC's authors, LMIC's authors with less experience may face challenges breaking through. Establishing a mentor relationship between LMIC's authors and editorial board members with their HIC's counterparts will be key to balancing the scales.

5 | ASSIMILATE NEUROSURGICAL CAPACITY BUILDING

Global neurosurgery does not exist separate from global surgery and global health efforts. The COVID-19 pandemic exposed a tremendous deficit in critical care capacity worldwide, both in HIC's and LMIC's. A focus on surgical, obstetric, and anesthetic care capacity building can help strengthen health systems by providing the necessary infrastructure for pandemic and mass casualty preparedness. Neurosurgery requires the same infrastructure, and efforts to build neurosurgical capacity should not occur isolated from the broader surgical and healthcare capacity building undertaken by multitudes of agencies around the world. To this end, the GNC Action Plan calls for neurosurgeons to integrate into national surgical strengthening processes and participate in major global surgical conferences to build collaborations and a community beyond neurosurgery that can partner in addressing the global needs.

6 | ADVOCATE FOR UNIVERSAL NEUROSURGICAL CARE

The adoption of Universal Health Coverage (UHC) as an integral part of surgical care to bolster global health, as affirmed by the WHA68.15 resolution, is key to global surgery - and global neurosurgery - efforts in developing countries. This strategy permits safe, affordable, and accessible surgical care for those who need it most. Advocacy for UHC to help drive global neurosurgery efforts is an essential part of the Global Neurosurgery Committee Action Plan.

The GNC encourages the participation of neurosurgeons in global surgery advocacy events such as the United Nations General Assembly and G4 Alliance. By using the growing global surgery interest and global surgery events as the entry point to access international audiences, global neurosurgery can build on this momentum to advocate for the upscaling of neurosurgical care in the developing world.

Working with industry partners for a shared vision is a vital component of advocating for global neurosurgery. Specific industries such as sports or manufacturing companies face the challenges around head trauma often. Head trauma is one of the significant diseases burdening LMIC's, a common interest. Global neurosurgery can find allies in certain industries to advocate for better care, especially in places with the greatest need.

7 | CONCLUSIONS

The GNC Action Plan is a measured, targeted approach towards amplifying, aligning, advancing, assimilating, and advocating for better neurosurgical care in the developing world. Through key partnerships, WFNS members, and a working Secretariat group, the GNC Action Plan stands as a leading model for improving global neurosurgery efforts.

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