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NeuroGenesis feature Careers in Global Neurology

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The Globalization of American Neurology

During the past two decades US medical education and indeed academic medicine have undergone a transformation from a predominantly domestic and perhaps somewhat insular discipline to becoming one increasingly aware of and engaged with the larger international community. Undergraduate student exchange programs in the 1990s were largely limited to activities in Europe and few medical schools offered any structured opportunities outside of the US. By 2006, 30% of medical schools offered international electives¹. This transformation in medical education has been driven by student interest² and a huge influx of funding for international health programs, primarily through HIV/AIDS-related projects³. American non-governmental organizations (NGOs) and philanthropic institutions have expanded their activities and support to include low and middle income countries (LMICs)³. Funding for global health has rocketed from \$5.2 billion in 1990 to \$21.8 billion in 2007³. The Consortium of Universities for Global Health, founded in 2007, includes over 80 US and Canadian academic institutions with more than 30 international affiliates⁴. Undergraduate concentrations in international studies and global interest groups in medical schools are now the norm⁵ and most elite medical schools now offer programs in international health.

US Neurology has certainly been engaged in this global expansion trend. In the past 3 years, a Global Health Section has been founded within the American Academy of Neurology (AAN)^{6, 7}, the American Neurological Association (ANA) has initiated an International Outreach Committee⁸, the American Epilepsy Society (AES) has joined forces with the International League against Epilepsy (ILAE) to draft shared clinical care guidelines^{9, 10}, and the American Brain Foundation/AAN has awarded at least one clinical research training fellowship annually to a candidate conducting research outside of the US. Change agents within academic neurology pushing for greater global engagements have primarily been younger academics seeking to carve a more defined niche for their interests and to work within the existing framework of US academic neurology. More than half of US neurology residency programs accommodate global health electives¹¹. At the same time, a growing number of international stakeholders including the United Nations (UN), international NGOs, and large private donors have developed interests and investments in neurologic conditions¹². In 2012, the WHO released the first ever evidence-based guidelines for the care of neurologic disorders in resource-limited settings¹³.

Based upon a 2012–2013 survey of neurology residency program directors, >60% indicated that their trainees had an interest in international electives¹¹. Despite the financial challenges posed by Medicare funding constraints¹⁴, a number of prominent neurology training programs have thriving relationships with foreign hospitals and academic centers, which facilitate a mutually beneficial exchange allowing the hosting facility to benefit from the neurologic expertise of senior trainees. No comprehensive listing of such programs is presently available, though entities such as the AAN's Global Health Section are striving to compile these (www.aan.com/membership/sections/global-health/).

Shortly after taking office, Dr. Francis Collins, the Director of the US National Institutes of Health (NIH), identified Global Health as one of his top 5 initiatives¹⁵ and funding opportunities for international research collaborations in a broad range of academic fields relevant to neurology continue to increase. In February 2014, the Fogarty International Center celebrated the 10th Anniversary of their successful BRAIN program (this provides R21 and R01 funding through the Brain Disorders across the Lifespan Program)¹⁶. While the BRAIN initiative planted the early seeds for many ongoing research programs, funding opportunities for conducting international neuroscience programs have been forthcoming from neuroscience funders explicitly seeking global health applications (*e.g.* Notice of Availability of NINDS Administrative Supplements to Promote Global Health Research NOT-NS-10-019) as well as from global health funding sources seeking applications from the neurological sciences (*e.g.* the NIH's Medical Education Partnership Initiative expansion to training in the neurosciences in 2012). Although global training opportunities for neurologic clinicians and scientists are still largely limited to individualized mentoring with those who have pioneered their own path, this is an exciting time for a career in global neurology.

Types of Careers in Global Neurology

“Sometimes your only available transportation is a leap of faith.”

- Margaret Shepherd

Global Neurology, meaning sustained and dedicated work related to neurologic research, education, advocacy and/or clinical care in the global health arena, is an academic field in its infancy. The good news (or bad, depending on your temperament) is that the burgeoning global neurologist can craft a career unique to his or her interests and abilities. For descriptive purposes, successful academic careers in global neurology tend to fall into three categories delineated below.

Expatriate academic

These individuals spend a majority of their time working in the international setting where they hold substantive positions and have significant responsibilities within the local health or education sectors. The expatriate academic risks becoming overwhelmed by the demands and needs of their foreign home institution which will undoubtedly have needs in neurologic education and clinical services that cannot be adequately met with the available human resources. The expatriate academic's time in the US may be brief and focused upon dedicated periods of clinical service provision, thus allowing them to maintain clinical skills

and credentials relevant to US medical care. Longer periods in the US may be needed for grant preparation and research dissemination if the research infrastructure in their international setting is too limited to support these efforts. Maintaining a strong US affiliation is critical for the expatriate neurologist. Isolation is toxic to professional growth and scientific inquiry and most resource-limited settings suffer from a dearth of neurologic expertise. From a pragmatic perspective, very few institutions in LMICs have the administrative infrastructure and capacity to successfully apply for and administer funds from US federal entities. A US home base is needed and the expatriate academic can offer his or her US institution unprecedented opportunities for research collaborations and international medical education.

US-based, internationally affiliated

Individuals who are based in the US but who have international affiliations and spend significant time in the international setting fall within this group. They are engaged in clinical care, medical education and research in the US as well as abroad although their US-based activities are limited due to obligations and activities that require weeks or even months outside of the US. Key challenges include issues related to maintaining continuity clinics and juggling teaching responsibilities, while meeting the needs of their global partners.

US-based, internationally engaged

Engagement in global neurology is almost always predicated upon some significant period of time working overseas, but once programs, projects and collaborative relationships are established, engagement can continue and even flourish while the engaged neurologist remains within the US. If local capacity has been expanded and strong local partners exist, the expatriate or affiliated neurologist may assume a less hands-on role and yet remain an important contributor to ongoing efforts. Individuals who have inside knowledge of health and educational systems abroad are also able to host strong, relevant mentoring and training programs for international students that ultimately return highly trained individuals to their home countries. These globally engaged neurologists may have academic responsibilities that are otherwise very similar to their US peers.

It is important to note that these three tracks are all part of a spectrum of activities with the academic neurologist being more or less involved in a hands-on way in the international setting. Through the ebb and flow of a career, the global neurologist may cross from one path to another depending upon personal circumstances, funding availability, the capacity of local partners, and the scientific imperative. Careers and lines of inquiry evolve organically over time and can be somewhat unpredictable, thus requiring special flexibility on the part of the academics, their colleagues, and their department leadership, not to mention their families.

Opportunities for more senior neurologists to engage in global efforts are also abundant. Those past the point of worrying about tenure or looking ahead to retirement on the horizon may find themselves ready for a new challenge and novel professional undertaking. Their clinical wisdom, mentoring experience, and scientific expertise are invaluable either as

“hands on deck” in the field or through co-mentoring of junior neurologists (US or International) working abroad.

Ingredients for a Successful Career

As with any career in academic neurology, the foundation for success in global neurology begins with solid training as a clinician/educator/scientist. Building on this and in the absence of any formal training programs in global neurology, most neurologists involved in sustained and dedicated work related to neurologic research, education, advocacy and/or clinical care in the global health arena have crafted their own career development, usually through both formal and informal mechanisms with the most critical informal mechanisms being facilitated by dedicated time in the field. For most of us, this is an iterative process. When undertaking global endeavors in an international setting the neurologist should have a solid understanding of local resources (both material and human), established health, education and research priorities, and the local burden of neurologic disease. Furthermore, this knowledge needs to be embedded within some significant understanding of the geopolitical and cultural environment. These insights cannot be gained from a literature review. One simply cannot develop a career in global neurology without some time working and living abroad. Trying to do so is like trying to complete a medical degree having read all the books but never having examined a patient.

Training in infectious diseases or tropical medicine is certainly relevant, but the scope of areas relevant to global neurology is much broader than this. Specific research skills and methods of particular value include qualitative methods (e.g. focus group discussions, participant observations, in-depth interviewing), epidemiology, mixed method research, health services/implementation sciences, and health economic analyses. Global neurology is inherently a multidisciplinary undertaking and additional education in or substantive exposure to other academic disciplines can enrich the global neurologist’s capacity for meaningful contributions in the international setting. Most of these topics are infrequently included in premedical education and clinical training.

Finally, assuming their activities benefit from extramural funding, global neurologists will often be functioning in settings devoid of institutional support for funded research and must therefore develop a keen understanding of issues related to regulatory compliance, finance management and grants administration.

Early Career Development

Individuals interested in developing a career path in global neurology will not find any ready-made fellowships or well-traveled career paths. There are several challenges to developing a comprehensive directory of opportunities in global neurology. First, unlike the US neurology training curriculum, the structure of these programs is often somewhat fluid. The preference may be for trainees at the chief resident or fellow level, but under some circumstances less senior individuals might be considered. There may be an attending neurologist at the host institution who could supervise, but the vagaries of responsibilities and travel schedules for host faculty may mean that they are not actually on site when the trainee arrives. Sometimes programs are dependent upon 1–2 dedicated individuals and

therefore are vulnerable to demise when personal circumstances change. And finally, interested US trainees may at times outnumber host opportunities making it unlikely that programs will advertise their options broadly beyond their own department.

The key to a successful international rotation whether as a trainee or an attending physician is advanced planning, serious effort to identify a good fit, and then as much as is possible, delineating well before the travel dates what the expectations are for both trainees and supervisors. Early inquiries at both the US and home institutions regarding medical malpractice requirements, licensure requirements, and elective approval procedures are needed. In most low income settings, there is little in the way of malpractice litigation—serious complaints are dealt with in the criminal court arena. Nonetheless, confirming the local situation is important. Even temporary medical licenses can require lengthy processing times and costs. If one is primarily teaching, malpractice coverage and licensure may be less relevant. Immigration formalities should also be fully reviewed and confirmed before travel.

Taking opportunities to work abroad through electives, volunteer positions, or short-term locum postings is key. But ultimately fellow or faculty positions with supportive chairs and strong mentors are needed. Most trainees benefit from a mentoring team which should include at least one senior person with a global health career focus but should also include someone senior in their subspecialty or research field of interest. Ideally, the mentoring team includes a senior collaborator from abroad. Mentors do not need to all be neurologists and indeed there is great benefit from a broader group of advisors. Global neurologists have a dedicated passion to their work and most are open to mentoring neurologists beyond their own institutions. It is through such mentoring relationships that we build our future colleagues and we generally expect that those we train will “pay it forward”.

Global neurology can bring a great deal of academic enrichment and added value to a US neurology department, but most departments cannot make heavy investments in growing global neurology and still meet their core mission in terms of medical care provision and education. As such, global neurology is and shall likely remain somewhat decentralized with senior people scattered throughout US academic institutions. The critical issue when selecting a US institution from which to launch a career in global neurology is finding a home department that is truly supportive of the career plan with a shared vision of what this would look like and how it can be made sustainable. Accepting a position in which the department chair views one’s global neurology endeavors as an interesting hobby likely dooms any plans to failure. Fortunately, as detailed above, there is a growing number of neurology departments where global activities are valued.

The Way Forward

Despite the substantial interest from trainees, the expanding attention from the academic neurology and global health communities, and the growing opportunities for research funding, no formal training curriculum or fellowship programs in global neuroscience exist in the US today. But global health *is* an emerging specialty within neurology¹⁷. Academic neurology needs to develop a framework for global neurology training, and formalizing a curriculum will likely further enhance interest among potential trainees. A clearly defined

training program and academic deliverables associated with the program are also likely to increase support for global neurology activities among the medical education leadership in neurology. Until formal training evolves, the global neurology trainee will by necessity continue to be something of a pioneer, relying upon the small but growing cadre of established colleagues for mentoring and direction.

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Sidebox 1**A personal career path in global neurology**

After an international elective in Zambia as a fourth year medical student, I was able to structure my residency research elective time to pursue further work at the same institution. My fellowship in health services research and MPH program allowed me to develop the skills to develop my residency research into peer-reviewed publications. Everything led up to a junior faculty position in a department where my chair viewed my international endeavors as a viable career option. Today, I spend 6 months a year in Africa engaged in research, clinical care and medical education.