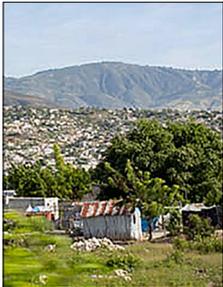




The rise of neurology in Haiti

Haiti is a country of 10.5 million people, but there are few specialists to address the large burden of neurological conditions. However, current initiatives are underway to increase workforce capacity. Jacquelyn Corley investigates.



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For an **overview of Haiti's economy** see <http://www.worldbank.org/en/country/haiti/overview>

For more on the **prevalence of neurological conditions in Haiti** see *J Neural Sci* 2017; **379**: 327–30

For the **study on emergency department admissions** see *World Neurosurg* 2014; **82**: 948–53

For the **development of the fellowship programme** see *J Neural Sci* 2016; **360**: 158–60

The word Haiti means “land of high mountains”, which accurately describes the country’s large peaks that jut upward into blue skies and are blanketed by tropical trees. These hillsides are peppered with rural villages of tin-roof houses that are connected by snaking dirt and paved roads. In the air hangs a tangible resilience, even in the shadow of the devastating earthquake that struck the island eight years ago. The country’s vulnerability to natural disasters has left it in a continuous economic struggle: currently, more than half the population survives on less than US\$2.50 per day, and about one-quarter of Haitians live below the national extreme poverty line. In this economic context, the Haitian health-care system struggles to cope with a variety of public health issues, which include a high prevalence of neurological conditions that cover a wide spectrum—for example, stroke, epilepsy, and headache. A CT-based study in three major hospitals in the country reported that neurological conditions accounted for 16% of emergency department admissions, with the most common diagnoses represented by cerebrovascular disease, neurotrauma, and altered mental status. Despite the large burden of neurological disease within the population, until recently, Haiti had few specialised providers to diagnose and treat neurological patients. Aaron Berkowitz, a neurologist at Brigham and Women’s Hospital (Boston, MA, USA) and the Director of its Global Neurology Program, has been the catalyst in Haiti to build capacity and address this important need.

Berkowitz began working in Haiti about 6 years ago through a non-profit organisation called Partners in

Health, based out of Boston. At that time, there was only one neurologist in all of Haiti, and patients with neurological conditions were often seen by their general practitioners who had no formal training in neurology and limited experience with clinical cases. Berkowitz began teaching basic clinical skills in neurology to internal medicine residents in Haiti during week-long sessions several times per year. Eventually, this took on a formal structure of a four-week in-patient rotation with second-year internal medicine residents at the Partners in Health hospital, Hôpital Universitaire de Mirebalais (Mirebalais, Haiti)—a 300-bed facility that provides care to some 185 000 people in the surrounding areas. Over the course of the four weeks, Berkowitz and the residents would provide neurological consultation to the hospital and see about 150–160 patients. The success of this pilot programme was evident and provided much-needed inspiration for expansion.

In 2015, Berkowitz helped to establish the first-ever neurology fellowship programme in Haiti with the support of Partners in Health and Brigham and Women’s Hospital, as well as collaboration with key individuals, including Michelle Morse, the Assistant Program Director for the Internal Medicine Residency at Brigham and Women’s Hospital and Kerling Israel, the Senior Advisor for Medical Education at Partners in Health. The ongoing two-year programme enrolls one fellow per year, and qualified USA-based faculty members spend 1–12 weeks in Haiti each year precepting and providing education and oversight for the fellows. Berkowitz estimates that during the programme’s first two

years, trainees saw an average of 870 patients per year. Thanks to this innovative effort, many patients who otherwise would not have had access to these specialists are now able to receive neurological care.

The programme’s first fellow, Roosevelt François, graduated last year. Prior to starting the programme, François had 20 years of internal medicine practice, but he had always been drawn to neurology because of its unique challenges. After his fellowship, he was hired as a faculty member of the Hôpital Universitaire de Mirebalais and programme director-in-training for the fellowship. He states, “I consider myself an eternal student, so I can enjoy this work because I know that by teaching I learn.”

As increasingly more fellows complete their training, there will likely be a workforce to develop the programme’s curriculum and provide mentorship at the Hôpital Universitaire de Mirebalais, while also dispersing out to other regions of Haiti where access to neurological care is sparse. Eventually, Berkowitz hopes to leave his position as director and have the programme completely locally run. François has a similar dream, but he also recognises the challenges that lie before him. “We will need to work hard to improve our service”, he says. “We need our own neurology service so that we can follow and manage in-patients. For now, our patients are spread out through different units in the hospital. We also need more technical assistant and lab facilities.”

While neurology as a discipline has just taken root in Haiti, the field of neurosurgery has also had its own paralleled achievements and challenges. The neurosurgeon ratio

per 100 000 people is only about 0.04, and currently there is no structured model of neurosurgical care beyond the city limits of Port-au-Prince. Further, there is a dearth of epidemiological and population-based studies to quantify the burden of neurosurgical disease and characterise Haiti's needs. Prior to 2016, the country relied on sporadic surgical mission trips from USA-based neurosurgeons. These were successful in treating a large number of adult and paediatric patients, but they did not increase local workforce capacity. However, in 2017, the first neurosurgical fellowship was established to remedy this deficit. Implementation of this programme involved partnership with the Haitian Ministry of Health and the Hôpital de l'Université d'État d'Haiti (Port-au-Prince, Haiti) associated with the State University of Haiti. The idea was simple: to educate one fully trained, general surgeon per year on basic neurosurgical skills. This surgical training programme would be impossible without support from the strong partnership of Haitian L'Hospital Bernard Mevs and Miami-based non-profit, Project Medishare and its sister organisation Haiti Healthy Kids Inc, a venture that began in Haiti after the 2010 earthquake with a 300-bed trauma and field hospital in Port-au-Prince. Eventually, the temporary hospital migrated from tents on abandoned airport landing strips to L'Hospital Bernard Mevs, which is now the only trauma and critical care hospital in the country, and is staffed by both travelling volunteers and local health-care workers.

At L'Hospital Bernard Mevs, neurosurgical trainees receive formal education with a curriculum that mirrors that of the Accreditation Council for Graduate Medical Education International. Surgical training focuses on procedures commonly encountered in Haiti, including hydrocephalus, congenital disorders, trauma, tumours, and spinal disease.

Fellows are mentored by an in-country programme director as well as rotating visiting neurosurgeons, who offer different perspectives on subspecialties within neurosurgery. Yudy LaFortune started the programme in February 2017 as the first fellow. As a general surgeon, he had theoretical knowledge of basic traumatic brain injury management but no further education in neurosurgery. Now he believes he is starting to acquire the practical skills required to maintain a neurosurgical practice. LaFortune states his mission plainly as he looks ahead: "The future directions start by creating a sustainable programme to train more neurosurgeons. I also think that strong partnership with the international neurosurgical communities and federations will be very helpful. Training general surgeons and [emergency room] practitioners with basic skills in managing neurosurgical emergencies is also crucial." The programme is steadily gaining momentum. Not only is there a trajectory for a sustainable and growing neurosurgical workforce, but surgical capacity and caseload has increased in the few years since the programme was first implemented. In fact, the number of neurosurgical procedures have nearly quadrupled from 2015 to 2017, with the majority of cases related to trauma or hydrocephalus.

The increased national attention to neurology in Haiti is also apparent in the recent revival of the Fondation Haitienne Pour Le Développement De La Neurologie Et De La Neurochirurgie (FHADNNEC)—a professional society of neurologists and neurosurgeons. Ernest J. Barthélemy, a member of FHADNNEC, is a neurosurgery resident from the Icahn School of Medicine at Mount Sinai Hospital (New York City, NY, USA) and a Paul Farmer Research Fellow at the Harvard University (Boston, MA, USA) Program in Global Surgery and Social Change. He has been the driving force in bringing together key participants

and stakeholders around Haiti for the revival of FHADNNEC. He reflects, "The motivation behind this work was that I understood the importance of building a professional community and an avenue for international recognition." Barthélemy reports that FHADNNEC is currently working with the World Federation of Neurological Societies Education Committee to launch the first scientific meeting in Haiti in 2019.

While development of neurology and neurosurgery is essential to tackling the large number of patients with neurological conditions in Haiti, it is important to recognise that this challenge will require more than just a larger trained workforce. Infrastructure within the health-care system is paramount to creating robust neurology practices nationwide. Currently, there is only one CT scanner in Mirebalais that is free to patients, and it is shared among the many medical and surgical disciplines. MRI scans are possible, but at a cost to patients of about US\$700. Similarly, advanced diagnostics such as CSF analysis, EEG, and electromyography either do not exist or can only be acquired as expensive and time-consuming tests that are sent out to other hospitals.

There is still much to accomplish in order to provide comprehensive and quality neurological and neurosurgical care in Haiti. This lofty pursuit will require participation from all stakeholders, both in Haiti and abroad, as well as a dedicated focus on health-care systems development. Despite the many challenges still in place, all those who have worked in Haiti on this important mission say that they are encouraged by the large efforts so many have already made to improve the country's health-care system and expand its educated workforce of neuro-clinicians. Addressing the unmet need of neurological diseases might soon be within reach.

Jacquelyn Corley

For more on the **neurosurgical residency programme** see *Neurosurg Focus* 2018; 45: E4
For more on **Project Medishare** see <https://projectmedishare.org/history/>