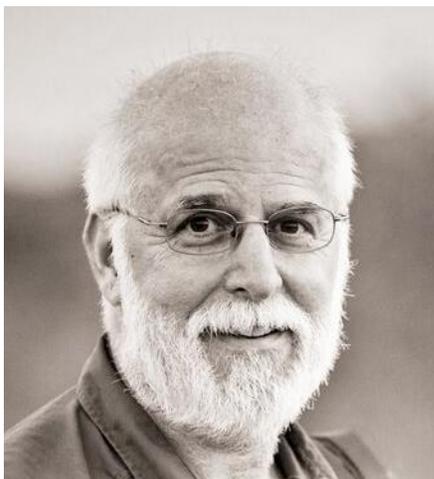


## MICHAEL N. RUBENSTEIN, MD

### *Global Neurologist Profile*

Anh-Thu Vu, MD



Michael Rubenstein, MD

Michael Rubenstein, MD, found himself working in global neurology almost by accident. With a background of residency training at the University of Virginia, he was already well established as a private practice general neurologist in the Philadelphia area and adjunct faculty at the University of Pennsylvania when his adventurous spirit led him and his children on a safari and volunteering trip to Tanzania in 2009. While there, he asked to see a local medical facility and found himself doing neurologic consultations with two local physicians, Dr. Frank Artress and Dr. Fredrick Mshana, both working at a clinic run by the Foundation for African Medicine & Education (FAME) in Karatu, Tanzania. Rubenstein was immediately drawn to the dedication of these physicians and the importance of the work they were doing. He returned the following

year as a volunteer medical provider. He remains a volunteer to this day and considers the FAME clinic his “second home.”

Over the years, Rubenstein has slowly grown the scope of neurologic care at FAME to an independent semi-annual clinic in association with the University of Pennsylvania and Children’s Hospital of Philadelphia. Since 2013, pediatric and adult neurology residents have accompanied him to Tanzania twice a year, staffing a clinic in conjunction with local providers, as well as a mobile clinic that visits outlying areas. Visiting residents and staff also provide education for local medical providers on the neurologic exam and management of neurologic conditions. Future plans include an exchange program in which Tanzanian medical providers travel to the United States for an observership in neurology.

With the support of the Department of Neurology at the University of Pennsylvania, Rubenstein has also been instrumental in developing a global neurology curriculum for residents. He has started a Global Health Track at the University of Pennsylvania for neurology residents that includes not only travel to other parts of the world, but also includes “Global Health at Home”—a program geared toward addressing health disparities in the Philadelphia area, working to

provide neurologic care to refugees and Spanish-speaking patients, with plans to expand further.

Rubenstein feels that there are many skills that can be learned through practicing neurology in a resource-limited setting. It forces neurologists to rely primarily on a good history and detailed neurologic exam rather than a plethora of available tests. Practitioners must think critically about cost-effective medical decisions—each test and treatment may have significant cost to the patient, particularly if the treatment is ongoing. It is also important to consider the cultural context in which care is delivered. For example, educating patients about the diagnosis of epilepsy can help to reduce the stigma of seizures both at home and in the community.

As a member of the AAN Global Section, he feels that the section has an important role to play in expanding access to neurologic care around the world. This includes global education and outreach programs, and promoting initiatives that enable patients and medical practitioners access to necessary medications to treat neurologic conditions. Within the section, collaboration among colleagues is key in devising creative and affordable solutions to improve access to diagnostic tests such as imaging and EEG.

Although serendipity may have led Rubenstein to the FAME clinic, he has truly embraced the community there as his own family. He feels that the success of the FAME neurology clinic has hinged on the partnership between the visiting practitioners, FAME staff, and the local community. No decision is made without input from local practitioners on what they need and feel is right. It is this partnership and community that led him to build up the neurology program at FAME, and everyone involved is better because of it.



Michael Rubenstein, MD examining a patient in Tanzania

# ICELAND

## *Neurology Country Profile*

Ágúst Hilmarsson, MD

Edits: Scott Grossman, MD



Iceland is a small island (approximately the same size as Kentucky) in the North Atlantic Ocean. The population of Iceland is a little over 330,000. Two-thirds of the population lives in or near the capital, Reykjavik. The remaining 1/3 lives in smaller towns and farms that are mostly on the coastline. The settlement of Iceland began in late 9th century when Norse settlers made the journey. People from other Scandinavian countries, Scotland, and Ireland followed. Genetic markers can be found that link the

Icelandic population to these countries. We have our own language, Icelandic, which is related to Scandinavian languages but resembles most closely the language spoken in Scandinavia 1,000 years ago. Iceland was isolated for centuries so the language did not evolve in the same way as the other Scandinavian languages did. In fact, we still can read the old/original Viking sagas.

Health care in Iceland is universal and is largely paid for by taxes. There is no private health insurance and no private hospitals. Landspítali University Hospital is the only university hospital in Iceland. It is a 700-bed hospital that is located in Reykjavik and is the primary hospital for two thirds of the population and a referral hospital for the rest. Landspítali houses our neurology inpatient service which is a 20-bed service. There is a considerable private sector within the health care system. Physician specialists have their private offices and some of them also work within the government run hospitals. The private sector has been gradually increasing and larger clinics have been formed and are now common outside the government run hospitals, but these clinics are limited because the government does not accept overnight stays by patients. This severely limits the type of possible operations in the private sector. Currently there is a heated debate whether private hospitals should be allowed. Additionally, we have smaller community hospitals in towns throughout the country.

There are 17 full-time practicing neurologists in Iceland (one per some 18,000 inhabitants) which is comparable to most northern European countries. With the small population, we have the greatest need for general neurologists. Over the years, more and more young neurologists have come back from training with subspecialization, usually along with considerable work in general neurology. In larger centers in the US and elsewhere you have “sub-subspecialized”

physicians; obviously there would not be a high demand for such sub-specialization in Iceland. Lack of access to subspecialists, not to mention sub-subspecialists, is one of the drawbacks of practicing in a small country. To me, this is also one of the things I find most appealing—being able to take care of patients with different neurologic diseases.

The majority of the neurologic care takes place in or near the capital, Reykjavík, with 10 out of 17 neurologists practicing at Landspítali University Hospital and only one neurologist practicing outside of Reykjavik. Few are in private practice. For the patients living furthest away from the capital, the travel by car may be six to seven hours to the nearest neurology clinic. This travel time may not seem much, but roads may be closed during parts of the winter making it difficult, and sometimes impossible, for the patients to travel to Reykjavik. Teleneurology is, therefore, an appealing use of technology, but it is not yet available in Iceland.

The more advanced therapeutic approaches remain a challenge in a small country. We are hoping to start offering interventional arterial thrombectomy this year, now that we have physicians with the expertise needed. Epilepsy surgery is not performed in Iceland. A long-term video scalp EEG monitoring is performed here and epilepsy surgery candidates are referred to a comprehensive epilepsy center in the US. Most of our epilepsy surgery candidates are referred to Rochester in Minnesota. The wait time for commonly used neurologic tests is longer than I got used to in the US. Typical waiting time for ambulatory MRI is six to eight weeks and three to four months for EMG. The waiting time for other tests varies more. We do have access to all medications approved in Europe.

Medical training starts after finishing junior college, usually at age 20. The duration of medical school is six years. After medical school, a one-year rotating internship is a requirement, during which time we are Candidates of Medicine. After completion of the intern year, we have earned a medical degree (MD). Education follows the same rules as health care. That is, it is supposed to be free. Most physicians spend 1-3 years as resident equivalents before seeking further training abroad.

There is no formal residency program in neurology in Iceland and the same holds true for most other specialties. There is a long tradition to train in neurology in the neighboring countries, primarily in Sweden. Approximately one out of every five Icelandic neurologists trains in the US. Moving to Scandinavia is easier because of similarities in culture, and neurology training in Iceland has been recognized towards specialty recognition. The US residency system provides more structured training. Long work hours and the need to repeat an internship year dissuade most from pursuing residency training in the US.

My own route was rather typical for Icelandic physicians. Like with other new graduates, I thought I knew what I wanted to do in life. For me it was Emergency Medicine. Therefore, I worked in the emergency department for one year. This was an invaluable experience but I did not see myself working there for the rest of my career. A large proportion of the visits to the ED were for neurologic problems and it became clear to me where my interest lay. My next stop was the neurology department, where I was a resident for over two years before moving to Rochester in New York where I did my residency training and neurophysiology/epilepsy fellowship at the University of Rochester Medical Center.

The spectrum of neurologic disease is comparable to what I am used to from training in Rochester. The more common diseases (stroke, multiple sclerosis, Parkinson's disease, etc.) you will see everywhere but due to the size of the population rare diseases are less often seen in Iceland. Therefore, comprehensive training in neurology is invaluable. Hereditary cerebral amyloid angiopathy is the only neurologic disease that is unique to Iceland, with approximately one new case diagnosed each year. The incidence of other neurological diseases (such as multiple sclerosis) has not been found to be different from the other Nordic countries.

Iceland is in many ways the ideal place to do a population-based and genetic study. The island population is well defined and access to medical records is good. There are few hospitals and most patients receive care in one place. Patients are therefore rarely lost to follow up. Additionally, the population is rather homogenous and we can trace our ancestors back to when Iceland was first being populated (over 1,100 years ago).



Landspítali University Hospital

# AN OBSERVERSHIP AT THE ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS)

Ernest O. Nwazor, MBB, PGDMgt, FMCP (Neurol)



Ernest O. Nwazor, MBB, PGDMgt, FMCP (Neurol)

After completing my residency training program in neurology in Nigeria, I felt a need to visit a bigger center outside my country, at least for an observership. The reason is not farfetched. Oftentimes, one completes residency training and becomes a specialist having passed all the necessary examinations, yet is ill-equipped to cope with contemporary subspecialty challenges that may be encountered in practice later. For instance, some of the medical equipment, or even treatment modalities, I often read about in textbooks during my neurology training were simply not available back home to facilitate balanced learning, and this situation continued to give me a sense of inadequacy.

India, though classified as a developing nation, has done a lot to revolutionize her health sector by building capacity in research and innovative health care delivery, and currently remains a major destination for medical tourism in the world. All of this probably influenced my decision to visit the Neuroscience Center of All India Institute of Medical Sciences (AIIMS) for observership. And I am happy I did!

My trip from Nigeria to New Delhi in the last week of November 2016 was essentially uneventful. I arrived safely in high spirits to commence a program that would last another three months. It was, indeed, the first time I would set my feet on the soil of India. Adjustment to my new environment was really not a major problem as my mentor, Professor M.B Singh, a consultant neurologist and co-chair of the neurophysiology unit, practically made sure I did not have any challenges—at least not the ones human beings can solve. To further highlight, Professor Singh was at the center of the whole arrangement that brought me to New Delhi. I remain grateful to her.

I commenced my posting in the neurophysiology laboratory. This unit offers a wide range of services which include EEG/VEEG, EMG/NCS, BAER, VEP, tremor studies, and so on. I was actively involved in these procedures and also helped to process patients' reports. One of the most interesting experiences to me was my participation in writing EEG reports and Prof M.B Singh was always on ground to vet every report before final dispatch to patients. I learned a lot about seizures and EEG reporting from her. Her weekly epilepsy clinic also formed another learning point for me as some of the interesting seizure cases were carefully discussed.

Apart from the neurophysiology unit, I also had interest in movement disorders. So, I regularly visited the movement disorder clinic and also observed various sections of Botox injection, both with and without EMG guidance; this treatment modality for certain movement disorders is not readily available in Nigeria and can be accessed in only a few centers. To me, developing skills in this form of treatment will go a long way in providing better care and more favorable outcomes to my movement disorder patients back home. I was really taught a lot about the principles of Botox injection and also observed a lot of cases under Dr. Roopa Rajan, movement disorder fellow, whose clinic I always looked up to attending. I remain a beneficiary of her great didactic skills!

Not all my objectives were met, though. I could not rotate through neuropathology, neuroradiology, and pediatric neurology units because I had a limited time to stay in India, but I hope to make up for this in my subsequent visits to AIIMS.

It was not all rosy for me in New Delhi. I encountered a few challenges during my stay. The most important was that accommodation around AIIMS was scarce and very expensive, probably because of high demand. I learned that the institution is already making efforts to solve this problem by putting up more structures to cater to accommodation needs of foreign visitors. So, I would advise prospective observers to AIIMS to consider that in their travel arrangements. Language barrier also posed a big challenge to me initially, but communication improved with time.

Generally, my stay in India was fruitful and the whole experience motivated me to crave excellence in clinical practice as a neurologist from a developing country. I learned a lot of virtues from Professor M.B Singh among which were discipline, diligence, and focus. The experience also offered an excellent opportunity for networking with both professional and non-professional colleagues, and all of them really made my stay in New Delhi memorable. I highly recommend neurologists from developing countries at the early stages of their career to visit AIIMS. My own experience surely made a great contribution to my career development.

## INTERNATIONAL AIDS SOCIETY 2017

### *Conference Update*

Omar K Siddiqi, MD, MPH

The International AIDS Society Conference on HIV Science was held in Paris, France, from July 23-26. As a first-time attendee, I was struck at how almost every lecture provided some take home lessons on global health in general, reinforcing the idea that HIV helped to invent the field of global health. There was no shortage of topics that touched on neurologic issues of HIV.

Dolutegravir is an integrase inhibitor that has started to be scaled up as a first-line treatment option in all settings because of its shorter duration to viral suppression, lower risk of drug resistance, and favorable side effect profile. The main side effect mentioned in multiple sessions was CNS in nature, specifically chronic insomnia and sleep disturbances. The overall CNS

complaints are still less in comparison to Efavirens. In addition, there are important interactions between Dolutegravir and the most commonly used anti-epileptics in resource limited settings (RLS) phenobarbital and carbamazepine. Carbamazepine and phenobarbital may increase metabolism of Dolutegravir resulting in decreased serum levels. The suggestion is to avoid this combination if possible or potentially increase the baseline dose of Dolutegravir. This has important implications for HIV patients with co-morbid epilepsy.

Results were presented from the ACTA trial that is a randomized controlled non-inferiority trial from nine centers in Malawi, Zambia, Cameroon, and Tanzania for patients presenting with their first episode of cryptococcal meningitis. The aim of the trial was to see if alternatives to two weeks of IV amphotericin B (AmB) were feasible given its lack of availability and difficulty of administration in RLS. Participants were randomized to:

1. Oral regimen of high dose fluconazole (1200mg/day) plus flucytosine (100mg/kg/day) for 14 days.
2. One week regimen of IV AmB (1mg/kg/d) plus high dose fluconazole followed by seven days of high dose fluconazole.
3. One week regimen of IV AmB plus flucytosine, followed by seven days of high dose fluconazole.
4. IV AmB plus high dose fluconazole for 14 days.
5. IV AmB plus flucytosine for 14 days (gold standard).

The outcome measured was two- and 10-week mortality. The most interesting findings were that short course one wk AmB-based therapy and the exclusively oral regimen or high dose fluconazole/flucytosine were non-inferior to two wks AmB-based therapy. In addition, one wk AmB + flucytosine was associated with better survival compared with all other arms. This study indicates the urgent need to make flucytosine widely available in sub-Saharan Africa where it is currently not registered in the majority of countries.

Dr. Felicia Chow, Assistant Professor of Neurology at UCSF, had an oral presentation “Higher HDL better brain? Higher HDL is associated with better cognition in a cohort of older persons living with HIV infection.” Her group looked at data from 988 patients from a prospective cohort of older patients in the AIDS Clinical Trials Group A5322 study looking at an association between cardiovascular risk and performance on a brief neurocognitive screen. In a multivariate regression analysis, her group demonstrated that longer ART duration and HDL was associated with better cognition in an older cohort of HIV patients. The study suggests that modifying HDL cholesterol may be one way of improving cognitive outcomes in older HIV patients.

Finally, there was a lot of time dedicated to the idea of differentiated care that is a patient-centered approach to adapt HIV care based on where a patient falls in the treatment cascade. For example, the approach to children, adolescents, pregnant women, and adult males should be different, rather than one size fits all. One interesting model of differentiated care are ART adherence clubs. It reduces the burden that stable patients place on health care facilities, increasing clinical human resources for new patients and those clinically unstable who are at risk of failing treatment. In the model, 30 patients are allocated to an ART club. The group meets either at a facility or community venue for less than one hour every two months. Group meetings are facilitated by a lay club facilitator who provides a quick clinical assessment, referral

when necessary, and dispenses pre-packed ART.<sup>1</sup> I immediately thought this model could apply to well controlled epilepsy patients in RLS. I have a large group of stable epilepsy patients who wait hours and hours in my clinic just to get a medication refill. I think the adherence club model would lend itself well to this group. There are countless lessons from HIV care that can improve neurological services in RLS.

1. Wilkinson LS.. ART adherence clubs: A long-term retention strategy for clinically stable patients receiving antiretroviral therapy. *SAJHIVMED*. 2013 Jul; 14(2):48-50.



Dr. Sile Molloy, St George's University of London, spoke about the ACTA trial

## ARTICLES OF INTEREST

Kiran Thakur, MD

Burton A. Training non-physicians as neurosurgeons in sub-Saharan Africa. [Lancet Neurol](#). 2017 Sep;16(9):684-685. doi: 10.1016/S1474-4422(17)30246-6. Epub 2017 Jul 5.

The surgical gap in sub-Saharan Africa is a major health challenge. Some countries are tackling it by training non-physicians as surgeons—including neurosurgeons. This article is an insightful piece describing some of the challenges and opportunities in training non-physician clinicians in surgical techniques, including life-saving neurosurgical techniques.

Ibekwe R, Jeaven L, Wilmshurst JM. The role of melatonin to attain electroencephalograms in children in a sub-Saharan African setting. *Seizure*. 2017 Aug 12;51:87-94. doi: 10.1016/j.seizure.2017.08.002. [Epub ahead of print]

There is limited access to electroencephalograms (EEGs) in sub-Saharan Africa. Melatonin induces "natural sleep" without the risk of airway compromise. This study evaluated the effectiveness of oral melatonin to attain electroencephalograms in South African children. 73 children were recruited, 88 (51%) male, median age 4 years 9 months (range 0-14 years). 87% achieved stage 2 sleep. Median sleep latency was 44.5min and duration of sleep was 25min (range 18.5-29min). Children had no post-sedation irritability, persistent drowsiness, nor any other adverse events or deferments for inter-current illnesses. Sedation with melatonin was less successful in children with developmental and behavioural problems, with a higher rate of artifacts. The study concluded that melatonin is effective and safe in inducing sleep for EEG recording in our setting.

## EVENTS & OPPORTUNITIES

Nirali Vora, MD

### **Events**

International Headache Society Congress  
Sep 7-10, 2017, Vancouver, Canada  
<http://www.ihc2017.com/>

World Congress of Neurology  
Sep 16-21, 2017, Kyoto, Japan  
<http://www.2017.wcn-neurology.com/>

Women Leaders in Global Health  
October 12, 2017, Stanford, CA  
<https://www.wlghconference.org/about-the-conference-duplicate-2/>

American Neurological Association (ANA) Annual Meeting  
Oct 15-17, 2017, San Diego, CA  
<https://2017.myana.org/2017-advance-program> - significant global health representation

Society for Neuro-Oncology (SNO) Annual Meeting  
Nov 16-19, 2017, San Francisco, CA  
<https://www.soc-neuro-onc.org/>

American Headache Society (ACS) Headache Symposium  
Nov 16-19, 2017, Scottsdale, AZ

<https://americanheadachesociety.org/events/2017-scottsdale-headache-symposium/>

International Stroke Conference (ISC)

Jan 24-26, 2018, Los Angeles, CA

[https://professional.heart.org/professional/EducationMeetings/MeetingsLiveCME/InternationalStrokeConference/UCM\\_316936\\_Registration-Housing-International-Stroke-Conference.jsp](https://professional.heart.org/professional/EducationMeetings/MeetingsLiveCME/InternationalStrokeConference/UCM_316936_Registration-Housing-International-Stroke-Conference.jsp)

### ***Opportunities***

Submit topic suggestions for 2018 Movement Disorder Society (MDS) International Congress.

Due Sept 8, 2017, Consider a global health topic!

<http://mds.movementdisorders.org/congress/congress18/suggestions/>

Fogarty Global Health Fellow Program

Apply through US university consortia, rolling

<https://www.fic.nih.gov/Programs/Pages/scholars-fellows-global-health.aspx>

Global Brain Disorders Research

Due Nov 7, 2017, Letter of intent 30 days before

<https://www.fic.nih.gov/Programs/Pages/brain-disorders.aspx>

Global Network for Women and Children's Health Research

Due Nov 27, 2017, Letter of intent 30 days before

<https://grants.nih.gov/grants/guide/rfa-files/RFA-HD-18-009.html>

Fogarty Emerging Global Leader Award (LMIC only)

Due Dec 14, 2017

<https://www.fic.nih.gov/Programs/Pages/emerging-global-leader.aspx>