

## NeuroAccess: breaking the cycle in resource-poor settings

*NeuroAccess—a project aiming to boost neurology training and clinical capacity in low-income countries—is looking for volunteer neurologists. Dara Mohammadi speaks with its founders about the problems, their ideas, and the future.*

For more on **NeuroAccess** see <http://www.neuroaccess.org>

For more on the **Brain Infections group** see <http://www.liv.ac.uk/infection-and-global-health/research/brain-infections-group/>

For more on the **neurological infections diseases course** see <http://www.liv.ac.uk/neuroidcourse/>

For **The Encephalitis Society** see <http://www.encephalitis.info/>

For the **Association of Brain Neurologists** see <http://www.theabn.org/>

For more on **NeuroPaces** see <http://www.liv.ac.uk/neurosciences-research-unit/neuropaces/>

The warm autumn sun is reflecting off the windows outside Euston station in London where Benedict Michael and Sam Nightingale are sitting at a coffee shop. Amidst the hordes of hurried commuters, the two neurology specialist registrars are talking excitedly about their project, *NeuroAccess*, which they set up 2 years ago to help boost neurological training and clinical capacity in low-income countries.

Both clinicians are part of the University of Liverpool's Brain Infections Group, which has some 25 members—neurologists, infectious disease physicians, and basic researchers from around the world—doing research and providing clinical services and training in the UK, Asia, and Africa. Michael specialises in encephalitis, Nightingale in HIV.

"Neurological infections are among the most treatable and preventable parts of neurology", says Michael. "And researching them forces you to think more globally—the burden is so much larger outside of countries like the UK, meaning there is so much more potential to make a real difference with simple interventions."

The annual Liverpool neurological infectious diseases course offers a few free places to doctors from low-income countries, but is always over-subscribed. So, on one of the Brain Infection Group's annual research retreats, the two decided to take some of the teaching they do overseas.

"We just realised that there's no point in advancing knowledge and science if it's not being applied properly", says Nightingale. "There were lower-hanging fruits, if you like, to apply ourselves to, which was making sure that these places had the tools to implement this knowledge."

By their own admission *NeuroAccess*—which they run in collaboration with and with some funding support from The Encephalitis Society and the Association of British Neurologists—is a fledgling operation: they have so far been to Lusaka, Zambia, in 2013, and to Beira, Mozambique, in 2014. But they are aiming to tackle a very big problem—a crippling shortage of neurologists in poor countries.

WHO estimates that the median number of neurologists in low-income countries can be as low as 0.3 per million population. And this dearth of expertise, they say, is creating a vicious cycle that precludes many patients from receiving simple, potentially life-saving treatments.

"People are trained as undergraduates by general doctors then suddenly find themselves as the doctor training the next generation without ever having any specialist training", says Nightingale. "The idea of *NeuroAccess* is to break that cycle—to go there and pass on clinical skills and leave a teaching legacy that can be passed on."

"It all sounds very grandiose", adds Michael, "but the idea is for it not to be. For some, neurology has the perception of being too complicated for this setting, but with the right training it really doesn't have to be." He explains that they fund their *NeuroAccess* trips by running undergraduate neurology revision courses in the UK and the postgraduate *NeuroPACES* courses. "So the scope for doing the same sort of thing out there where the need was all the greater just seemed like a no brainer."

In June of this year they visited Beira Public Hospital, the second largest hospital in Mozambique. The hospital has 900 beds and often many more patients, many of whom, explains Annett Pfeiffer, a paediatrician in charge of clinical training at the hospital, are in need of neurological care.

"We have many cases of untreated hypertension, untreated stroke, neurological infectious diseases like malaria and HIV", she says. "And this is contrasted by the fact that we have no Mozambican neurologist in the hospital. Our diagnostic tools—CT scanner and laboratory—aren't always working. So basically you have to rely on your clinical skills, which for neurology we don't have. Care of neurology patients here in Beira is far from satisfying."

"It was absolutely awful", explains Nightingale, saying they were met with a similar picture in Lusaka. "In both places there were young people riddled with bed sores, contractures, one person in status epilepticus, another with a gunshot wound through the leg which caused sciatic nerve damage." The patients were abandoned, he says, because of a culture that nothing



Sam Nightingale showing junior doctors in Mozambique how to do a neurological examination

Michael Benedict and Sam Nightingale

could be done for them because their problems were neurological.

During their stay they did courses in setting up research projects but also ward rounds and hands-on training courses. "It was about saying: 'OK, even if you can't fix the CT scanner and can't do neurosurgery'", explains Michael, "there's a whole lot that can be done with simple bedside management—preventing contractures, preventing bed sores, treating the status epilepticus."

"One of the things that got us both into neurology is that it's such a hands-on speciality", says Nightingale, "you don't always need all these fancy tests and machinery." Dependency on machinery such as an MRI scanner, he says, can plunge a family into debt as one scan could cost between 3–9 months of a family's income.

"I've really noticed a difference in my students and junior doctors", says Pfeiffer, who is looking forward to Michael and Nightingale's return next April. "It was only for a couple of weeks but they seem less afraid about neurological patients, they are quicker in their differential diagnoses, and seem to be realising that, yes, there are some neurological cases that we can't help with but for some, especially the infections, there are drugs that we have here and the patients can be helped."

Tom Solomon, Head of the Liverpool Brain Infections Group, agrees, adding that demystification of neurology is part of the challenge. One problem that affects many countries in sub-Saharan Africa, he says, is the idea that epilepsy, rather than being a medical disorder, is caused by supernatural powers.

"There's a challenge making people realise that this is not someone who's been afflicted by a witch doctor", he says, stressing that the belief is held by some communities but not doctors, "but that a patient with epilepsy is someone with a neurological condition who you can treat with a simple drug. It's getting these simple things—be they clinical skills or

treatment information—over to the doctors in these settings so they have the confidence when dealing with communities who sometimes think like that."

Such beliefs and the stigma linked to epilepsy are deep-rooted and will take time to address. But en route to such goals, the group have been working towards making free, online resources of information about neurological care. "There's this disconnect between the sometimes quite antiquated books in hospital libraries in some of these places, and the fact that nearly all clinicians we see have smart phones and are dipping in and out of things like Facebook!", says Michael.

Michael figured that rather than replace the libraries he'd make a mobile application. "It's about £34 to get the app for the Oxford Handbook of Emergency Medicine", says Michael. "So I thought 'you can do it for free.'" He listed the disorders in the Oxford Handbook of Emergency Medicine, including all non-neurological emergencies to ensure comprehensiveness, took publicly available guidelines for them, and combined them into a free app, *ClickClinica*.

"When you're reading the guide about, say, HIV in pregnancy", he explains, "it'll ask a few information-gathering questions. So what we get is real time 24-hour-a-day data on what disease we're seeing across the globe, all at the same time as getting the guidelines out there for free."

With the Liverpool group, Nightingale has developed online neuroinfection modules, *NeuroID* e-learning, which take users through clinical features, diagnoses, and management strategies for many tropical neurological infections. Both are keen to grow and expand these online resources given the rapidly expanding access to mobile internet in low-income countries, though they stress that such resources are beneficial only as a supplement to proper clinical training.



Michael Benedict in Mozambique showing how the clinical signs identified at the bedside correlate to localisation of the lesion

Omar Siddiqi, Instructor in Neurology at Harvard Medical School (Boston, MA, USA), encourages projects such as *NeuroAccess*, saying the immediate lack of neurologists in resource-poor countries needs an all-hands-on-deck approach. "However, the ultimate goal should be to build up a local cadre of neurologists in each of these countries so that the expertise comes from and remains within countries", he says. "The training should ideally be done locally, with the aid of visiting neurologists, so that the trainees remain in-country. This is the holy grail for improving care in this region."

"While the aim is laudable", says Charles Newton (University of Oxford, UK), who is the scientific director of Muhimbili-Wellcome Programme in Tanzania and the head of neurosciences at the KEMRI-Wellcome Collaborative Programme in Kenya, "the initiative [*NeuroAccess*] is unlikely to gain much acceptance from many clinicians working within Africa and Asia, unless it is developed in partnership with societies from the continents, for example the Pan-African Society for Neurological Sciences, or countries, for example the Neurological Society of Kenya. This should be the way forward for *NeuroAccess* and the other teaching initiatives in Africa, Asia, and South America."

Dara Mohammadi

For more on **NeuroID** e-learning see [http://www.braininfectionsuk.org/neuroid\\_elearning/index.html](http://www.braininfectionsuk.org/neuroid_elearning/index.html)

For more on the **mobile app** see *Lancet Infect Dis* 2013; **13**: 116–17

For more on **ClickClinica** see <http://www.biomedcentral.com/1472-6947/13/70>