



# He who learns, teaches.—African proverb

By Alisa Kim

## INTO AFRICA

From a picturesque campus nestled in an affluent neighbourhood in Toronto, Canada, a pair of Sunnybrook Research Institute (SRI) scientists is helping to improve the health care, body and mind, of people thousands of miles away. Though their academic interests are different—Dr. Peter Burns in medical imaging and Dr. Anthony Feinstein in psychiatry—their research and expertise are making a difference in communities in Africa that lack health care resources and infrastructure.

“We do medical research only because we want to improve the medical care of people,” says Burns, an imaging scientist at SRI and chair of the department of medical biophysics at the University of Toronto. “I think all of us at Sunnybrook want and expect the impact of our work to be global.”

The global reach of their work—Burns in expanding the use of ultrasound in Malawi, and Feinstein in developing the first mental illness rating scale in Botswana—is being felt by African medical practitioners, in whose hands are now new diagnostic tools.

### TAKING CARE OF VULNERABLE MINDS

It would take three flights and over 24 hours for Feinstein to reach his destination. The lengthy trip from Toronto to Gaborone, Botswana is one the brain sciences researcher from SRI has made repeatedly to help build the country’s mental health care system. In two years he made four trips—self-funded—to help develop the Setswana version of the 28-item General Health Questionnaire (GHQ), a self-report screening tool used to indicate overall mental health. Setswana is the language spoken by nearly 80% of Botswana’s population. Created by British psychiatrists in 1979,

the self-administered GHQ, which has been translated into several languages and is used worldwide, measures the presence and severity of psychiatric disorder.

“Now the country has a rating scale for mental illness, which it never had before,” says Feinstein, who also helped develop the GHQ for use in Namibia. “The advantage with respect to Botswana is that it can be widely used because of the uniformity of the language spoken throughout the country.”

While in Botswana, Feinstein trained researchers to do a structured clinical interview of a sample of participants who filled out the GHQ. This involved teaching researchers how to make clinical judgements based on the interview, in order to compare their ratings with the participants’ self appraisals of their mental health. Feinstein found that the interviewers’ assessments satisfactorily matched the participants’ self-reported evaluations, thereby validating the responses to the translated questionnaire.

The rating scale can be used in clinics and hospitals to identify those who are psychologically distressed so that medical practitioners can prioritize care, an important benefit given the scarcity of mental health resources in Botswana. Feinstein’s hope is that the tool will also be used to support people with human immunodeficiency virus (HIV), who represent one-quarter of Botswana’s population. “It’s like a triage,” he says. “Not everyone who is HIV-positive is going to have psychological difficulties. If you have limited resources, you have to focus them on those most in need. With the GHQ you can determine who that is.”

Feinstein also gave talks at the department of psychology at the University of Botswana, and visited the country’s psychiatric hospital, where he consulted on a variety of cases during his

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short but intense visits. “It wasn’t just the development of the rating scale; there was the broader aim of lecturing and getting people familiar with psychiatry, mental health and my specialty, neuropsychiatry,” he says.

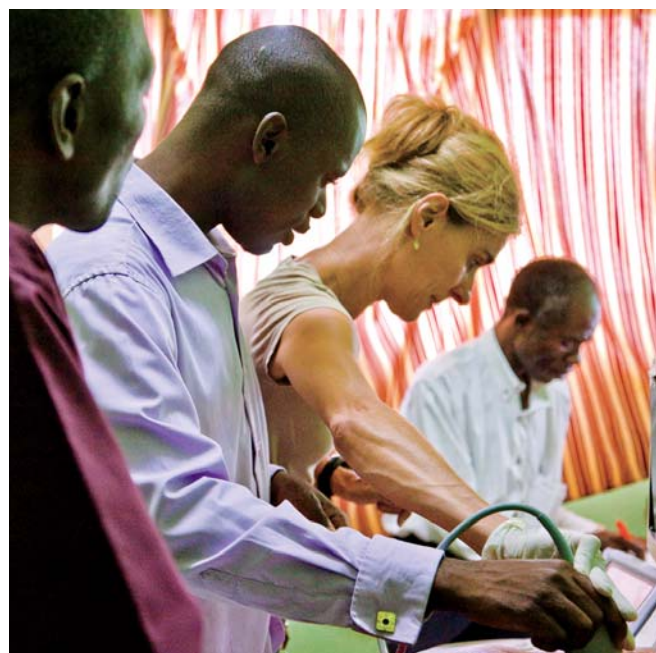
Through other research studies, he is also raising awareness about mental illness in people whose distress has hitherto been ignored: war journalists and contractors working in combat zones. A pioneer in this field, Feinstein is studying the psychological trauma experienced by members of these professions, and educates industry leaders on how to provide support to employees working in places of conflict. Last spring, he published the results of a study in the *Journal of Traumatic Stress* that was the first to show that many contractors working in war zones are experiencing psychological problems and not receiving therapy. Feinstein thinks one reason for contractors’ reluctance to discuss their emotional problems is the fear that doing so will be perceived as weakness.

“If people [working in war zones] are aware of what the potential problems are, then they might be more open to receiving help,” he says. “I think the biggest benefit from research like this is education: helping professions that are not psychologically savvy understand what can go wrong emotionally and how important it is not to ignore this.”

### DELIVERING EXPERTISE AND TECHNOLOGY TO DISTANT LANDS

When his Sunnybrook colleagues Drs. Michael Schull and Josée Sarrazin told him that they were taking their three children to Malawi on a one-year sabbatical, Burns saw an opportunity. Convinced of the viability of ultrasound imaging in developing countries, he proposed a pilot project whereby Sarrazin, a radiologist, would bring with her a portable ultrasound system to improve access to the technology in Malawi.

“Ultrasound is one of the most flexible and cost-effective medical imaging modalities in the world. Many places that don’t have the money or the infrastructure to support even an X-ray machine are able to support the use of ultrasound,” says Burns, who, no stranger to outreach work, also sits on the advisory board



TOP PHOTO: DR. ANTHONY FEINSTEIN

BOTTOM PHOTO: DR. JOSÉE SARRAZIN AND ULTRASOUND TRAINEES IN MALAWI



ALYSSA HOSEMAN AND DR. PETER BURNS

of SAFER (Social Aid for the Elimination of Rape). Founded by SRI graduate students, SAFER is a grassroots organization that helps victims of sexual violence in the Democratic Republic of the Congo.

Schull and Sarrazin moved their family to Malawi in July 2009 as part of Schull's work with Dignitas, a medical humanitarian organization. An emergency physician at Sunnybrook and researcher at SRI, Schull is developing a community-based model for the prevention and treatment of HIV and acquired immune deficiency syndrome. Sarrazin is training doctors and technicians in Malawi to use ultrasound imaging to help pregnant women, and is building networks between doctors in Malawi and Canada. Her presence in the southern city of Zomba, home to the country's only university, doubles the number of radiologists in Malawi.

Burns's collaboration with Sarrazin is an experiment in teleradiology. Thanks to the donation of the compact engine within an ultrasound machine by Zonare Medical Systems, and the crackerjack computer skills of his lab members, Burns provided Sarrazin with a powerful, lightweight system. Consisting of a handheld ultrasound unit and a laptop computer, the system—which weighs just over five pounds—can run on batteries for one hour. It will be used to support newly trained Malawian medical professionals after Sarrazin returns to Toronto.

"Not only will Dr. Sarrazin be able to use [the system] to help pregnant women in Malawi now, but when she returns and is back at work at Sunnybrook, she'll be able to look at the work they're doing there, to continue teaching and give them the advantage of her expertise," says Burns.

Using free open-source software, Burns's lab members Kogee Leung, Athavan Sureshkumar and Ross Williams turned the scanning unit and laptop into a picture archival and teleradiology system. Whenever Sarrazin scans a patient, the image is automatically stored and sent, fully encrypted, to a Sunnybrook server for a radiologist to review.

Though their contact is sporadic (due to challenges in communication in Malawi), Sarrazin told Burns that she is "delighted" with the improvised system. "Our job is to put together the skills

of medical practitioners with portable, adaptable and low-cost technology that will do the job," he says. "The fact that we've done it in a small way here is very exciting because we can imagine ways of repeating this many times over, and giving people in distant countries whom we've never met the advantage of a combination of technology and access to expertise which we have in Canada."

Alyssa Hoseman, an undergraduate student at the University of Guelph, is coordinating the project by liaising with Sarrazin and members of the Burns lab. She became interested in the project after meeting Burns at an open house for the department of medical biophysics at U of T.

"I was just getting a feel for what goes on in terms of the logistics of Third-World aid," she says of her role in the project. "There's a lot of organization that needs to be done because the lines of communication are so broken and there are so many people involved. I was the middle person helping to bring things together."

Hoseman spent last summer working at Sunnybrook, and continues to work from Guelph with Sarrazin and Sureshkumar to "work out a few kinks" with the file transfer system. Like Burns, her desire is to see this work replicated in other developing countries. "We've established a system that will enable telemedicine in the Third World, which means doctors here [at Sunnybrook] can interpret the scan. Having the system as a pilot project and using it as a model for other projects which can be implemented all over the Third World is my vision," she says.

There have been some snags along the way, including Internet and power outages, as well as running out of ultrasound gel, but Burns is nevertheless cautiously optimistic. "The real challenge is doing something that's sustainable. This is the first step toward making a sustainable structure possible in Malawi. Although there are lots of challenges, it's an exciting thing to do."

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Feinstein's research on the development of the GHQ for use in Namibia was funded by the Guggenheim Foundation.