

MSU researcher helps develop computer game for Ugandan children recovering from cerebral malaria

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EAST LANSING, Mich. —The computer program Captain's Log – originally used with individuals diagnosed with attention deficit hyperactivity disorder, brain injuries or learning disabilities – is being adapted to rehabilitate Ugandan children who are survivors of cerebral malaria.

Michael Boivin, a Michigan State University associate professor of neurology and ophthalmology and of psychiatry, and Bruno Giordani, a University of Michigan associate professor of psychiatry, are leading the project.



A training session for members of the project team at Mulago Hospital in Uganda on how to set up Captain's Log. Photo by Michael Boivin, MSU.

“So far as we know, this will be the first attempt to implement a cognitive rehabilitation training program in Uganda with children in the aftermath of brain injury,” Boivin said. “Such programs for children with special needs are readily available in America, and in other parts of the developed world, but not in Africa.”

Every 30 seconds a child in Africa dies from malaria - around 1 million every year, he said. Cerebral malaria is a severe form of malaria that affects the brain and is fatal in about 15 percent to 30 percent of the cases for hospitalized children.

“Our most recent follow-up evaluation of our cerebral malaria children indicates that 26 percent of them have persisting mild to moderate cognitive impairment, mostly in the area of attention and to some extent in visual-spatial working memory,” Boivin said.

The computer game is a comprehensive set of computerized cognitive training programs consisting of five modules including developmental, visual motor skills, conceptual skills, numeric concepts with memory skills and attention skills.

The research team is hoping that this intervention can help cerebral malaria-affected

school-age Ugandan children improve their cognitive skills, leading to improvements for both activities of daily living and school-related learning and skill development.

“The program attempts to do so with the use of 33 multilevel brain-training exercises designed to help develop and remediate attention, concentration, memory, eye-hand coordination, basic numeric concepts, problem solving-reasoning skills, self-esteem and self-control,” Boivin said.

Originally developed in 1985, the program is used with children 6 years and older and adults and has been used in a variety of therapeutic, school and home settings in all 50 states, U.S. territories and 23 foreign countries. Also, the program has been adapted for use in a wide range of non-English speaking settings.

Boivin and Giordani have trained a Ugandan study team to help implement and evaluate the program.

“We trained our study team at Mulago Hospital in Uganda, and they helped us in testing the program,” Boivin said. “The onsite project research manager, Paul Bangirana, can now program and set up Captain's Log on his own.”

This pilot study is supported by a Global Health Research and Training grant from U-M and through Boivin's startup faculty funding.

In addition, the study will provide an opportunity to establish partnerships between the U-M Neuropsychology Section; MSU International Neurologic and Psychiatric Epidemiology Program; and the Department of Pediatrics and Child Health, Makerere University School of Medicine, Uganda.

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