Global Health Challenge

Physicians delivering healthcare in rural communities in developing countries face a number of challenges. Poor infrastructure and the remote locations of villages may prevent medical teams from being able to use electronic diagnostic equipment. Additionally, follow-up visits with patients may be difficult, so doctors need to be able to make an accurate diagnosis during the patient’s initial visit.

Appropriate Solution

Students designed a diagnostic-lab-in-a-backpack, which contains the tools to perform a basic diagnostic exam, including a 100x oil immersion microscope, a centrifuge, an otoscope, an ophthalmoscope, a glucometer, a pulse oximeter, a sphygmanometer, several rapid diagnostic tests, and consumable supplies. The equipment in the pack is powered by a laptop battery that can be charged by the portable solar panel in the pack or AC wall power if it is available. The laptop battery can power the equipment for several days, and the supplies are sufficient for a two-week medical brigade. Diagnostic tests and supplies can be customized by region to address prevalent health conditions in the places where the pack will be used.

Current Status

Since 2007, students have worked with faculty and clinical mentors to design, test, and refine the backpack, which has been used by more than 30 physicians to care for approximately 7,200 patients in 8 countries. In January 2010, Rice University delivered 24 packs to the Ministry of Health of Ecuador, which is using them in mobile clinics throughout the country. As of July 2011, more than 10,000 patients in Ecuador had benefited from the packs. The delivery of the packs to Ecuador was the first country-wide scale-up of a BTB student-designed intervention.

“This is really important because so many people who are willing to go and help people don’t have the materials to do the job….The potential of this to save lives is really quite staggering.”

- President Bill Clinton, CGI U 2008