

## Diagnostic Lab-in-a-Backpack



“We're getting along well here and are really enjoying providing medical care to the kids and communities around Tegucigalpa; The lab has been very helpful.”

—Matthew Brown  
Baylor Shoulder to Shoulder

### Global Health Challenge

As the focus on global health initiatives increases, physicians face significant challenges when trying to provide adequate care for patients in the developing world. As much of the world lives in rural communities, physicians are called on to visit areas that are reached by traveling on foot. Travel over rough terrain or a lack of resources such as electricity can further inhibit the doctor's ability to provide even routine examinations in these rural environments. While Honduras comprises only 17% of the population of Central America, it makes up 60% of the AIDS cases for the same area, thus creating a need for effectively delivering healthcare to extremely remote mountainous regions. Our initial partner in this project, the Baylor Shoulder to Shoulder Program, travels to Honduras and works in a rural medical clinic. However, to reach all patients, they often hike into more rural areas and treat/diagnose patients in the home. Gathering the appropriate medical equipment that the physician teams need into an easily transportable pack is a tremendous challenge. In addition, many of the rural settings that are visited do not have the power needed to run medical equipment.

### Appropriate Solution

The Diagnostic Lab-in-a-Backpack, that was developed by senior design students in BIOE 451, provides an efficient and cost effective way to deliver quality healthcare to remote areas. The portable “lab in a backpack” that carries items, such as a microscope and micro centrifuge, for a physician to perform medical exams in remote areas. The device can also be “tailored” to fit specific regions and contains a rechargeable power source for providing its own electricity when away from the clinic. A solar panel can be used to recharge the battery if needed. The SouthFace team conducted initial testing for the device with MD/PhD students at Rice University. The pack subsequently went on two trips with students, interns and residents from Baylor College of Medicine. Mentoring and guidance for The SouthFace team was provided by design professor Dr. Maria Oden, Dr. Roosevelt Alcorn, Gwen Hoben, Jim Kretlow, Tm Muldoon, Roman Natoli, Elizabeth Stephens; Drs. George Parkerson, Fareed Khan, David Hilmers, Stephen Scott from Baylor College of Medicine.

### Current Status

Field testing trials have been conducted in conjunction with two teams from Baylor Shoulder to Shoulder in Honduras and based on feedback we are modifying and improving the design of the backpack. An additional team is currently using the pack in Haiti and will provide feedback from an alternate location. Based on this feedback, we plan to make adjustments in the device to further suit the growing needs of global healthcare in Africa, Honduras, Haiti and other locations.. We will create 10 packs for at least three locations in the next year.

*An initiative for the advancement of appropriate, high-value innovations in global health biotechnology*

### BEYOND TRADITIONAL BORDERS



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