



Unique design separates the cooling chamber from the medicine cooler to greatly increase efficiency and reduces the amount of time— and power— needed to keep the medicines cool.

Medicine Refrigeration: CoolMEDS

Global Health Challenge

In 2005, an estimated 24.5 million people were living with HIV and about 2.7 million new infections occurred that year (UNAIDS). HIV has greatly impacted Africa, specifically Sub-Saharan Africa with the countries of Zimbabwe, Lesotho, Botswana and Swaziland having the four highest rates of infection in adults. This epidemic is causing an ever increasing strain on the already burdened medical infrastructure in these and other similar countries globally. For pediatric patients, many of their antiretroviral drugs are in liquid form and need to remain cool for extended periods of time with little or no power available. Another obstacle is that HIV/AIDS carries a stigma in many communities in Africa, so any solution must also be as inconspicuous as possible.

Appropriate Solution

BIOE 451 Senior Design Team ICE (Inexpensive Cooling Equipment) working in conjunction with the Baylor Pediatric AIDS Initiative developed the CoolMEDS device to overcome these challenging issues. The cooling system provides a cost efficient solution for keeping HIV/AIDS medications at the required temperatures for extended periods of time without having to rely on a constant power source. The device is also small enough to be stored fairly inconspicuously, a vital design goal. The device is battery powered and can run for up to 2 weeks without a recharge. Battery charging can occur with solar panels or at a separate site in the town or village without needing to transport the cooler. The flexibility of the device also allows it to be deployed in other instances where medicines need to be kept cold with little or no power available, such as in the case of Hurricanes Katrina and Rita. Initial design and testing was conducted by Team ICE members Jon Ludwig, Jonathan Hanson, Mark Mendenhall, Tim Josef and Christina Berry. The team was guided by senior design professor Dr. Maria Oden and mentored by Dr. Rob Raphael and Dr. Gordon Schutze.

Current Status

The design team won second place in the HSEMB Student Design Showcase Competition. They also won the top design poster within the Rice University Department of Bioengineering in the Spring of 2007. At this time, the device is undergoing review for finalization. Many of the design components and ideas are being incorporated into other current projects in the Beyond Traditional Borders program. Other similar designs are being developed for use in City of Houston Ambulances.

BEYOND TRADITIONAL BORDERS



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

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