10TH ANNUAL
UNDERGRADUATE GLOBAL HEALTH TECHNOLOGIES DESIGN COMPETITION
Welcome from Rice 360° Institute for Global Health!

Friday, March 27th (CDT) Schedule of Events

1:30 – 1:35 PM
Welcome & Introduction

1:35 – 1:45 PM
Finalist Presentation – ABIBAS

1:45 – 1:55 PM
Finalist Presentation – AT YOUR CERVIX

1:55 – 2:05 PM
Finalist Presentation – PROJECT ALIVIO

2:05 – 2:10 PM
BREAK/Ballot Submission

2:10 – 2:50 PM
Keynote Address by Dr. Wendy Taylor

2:50 – 3:00 PM
Awards & Conclusion

https://zoom.us/j/524970853

JOIN US!
Participate in the “virtual” event via Zoom from 1:30 to 3:00 pm CDT:
https://zoom.us/j/524970853

QUESTIONS?
email rice360@rice.edu

#RICE360DESIGN
Tag us on social media during the conference!

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Competition Judges

Shannon Abikhaled, MD
The OB/GYN Group of Austin

Nahreen Husna Ahmed, MD, MPH
University of Pennsylvania, Perelman School of Medicine

Steve Alley, MD
Pediatrician

Brooke Bernhardt, PharmD, MS
Baylor College of Medicine

Eirum Chaudhri, MD
Merck for Mothers

Stuart Corr, MEE, MA, PhD
Baylor College of Medicine

Patricia DaSilva
Procyrion, Inc

Delphine Dean, PhD
Clemson University

Dana Deardorff, PhD
Johnson & Johnson

Eric Fuller, PhD
University of Florida

Margaret (Peggy) Goetz, MD
Texas Children’s Hospital

Lisa Gonzalez
Johnson & Johnson

Michael Heffernan, PhD, PE
Fannin Innovation

Pablo Henning
Rice 360° Alumnus

Cassandra Howard, MSBME
University of Colorado Denver

Obinna Idika, MPH
UNICEF Nigeria

Richard Jacobs
Engineer, Retired

Scott Key, MArch
Every Shelter

Tiffany Kuo, MBA
PATH

Ryan Le, MD
UTHealth

Ning Li, MS, PhD
Tsingyuan Ventures

Joseph Lubega, MD, MPH
Texas Children’s Hospital

Christine Luk, MBE
Fannin Innovation

Stephanie Marton, MD, MPH
Baylor College of Medicine

Rohith Malya, MD
Baylor College of Medicine

Jainesh Mehta, MBA
Dimensional Solutions, Inc

Mamta Mehta, DDS
Dentist, Retired

Andy Miller
The Flex Company

Andre Muelenaer, MD, MS
Virginia Tech Carilion School of Medicine

Penelope Muelenaer, MD, MPH
Virginia Tech Carilion School of Medicine

Bindi Naik-Mathuria, MD, MPH
Baylor College of Medicine

Trishna Narula, MD, MPH
Harris Health System

Joshua Ozer
Bain & Company

Monika Patil, MD
Baylor College of Medicine

Chethan Ramprasad, MD
NYU Langone Health

Philip Repisky
Torc Robotics

R. Clay Roberts, MD
Radiology Associates of North Texas

Robin Roberts, MD
Texas Health Resources

Andrew Rollins, PhD
Case Western Reserve University

Yvonne Senturia, MD
Westport Pediatrics

Corin Shirley
University of California, San Francisco

Ewen Tseng, MD
Collin County Ear Nose and Throat

Shannon Weigum, PhD
Texas State University

Bharat Yarlagadda, MD
Lahey Health

Youseph Yazdi, PhD, MS, MBA
Johns Hopkins University
Dr. Taylor has spent her career driving advancements in global health. During her 6+ years as the Director of the Center for Accelerating Innovation and Impact at USAID, she spearheaded several initiatives including the Saving Lives at Birth Grand Challenge for Development. This initiative led global health innovators around the world to develop groundbreaking solutions for maternal and newborn health.

Prior to her work at USAID, Dr. Taylor founded BIO Ventures for Global Health, a nonprofit organization aiming to bridge the private and public sectors to foster global health solutions. Currently, Dr. Taylor is a Fellow at the Rockefeller Foundation studying the use of digital health technologies to predict and prevent pandemic threats.
Participating Teams & Problem Statements

Finalist Presentations
1:35 – 2:05 PM

Abibas

Institution: Georgia Institute of Technology
Advisor: Dr. James Stubbs

Members: Emilia Funnell, Fatma Rashed, Tristan Wu, Ashley Assa

Lacking transport incubators and connections to incubator manufacturers for maintenance, babies in Ethiopia are becoming hypothermic before they can receive care, which further complicates their treatments. Working to develop an efficient, reusable, and low-cost hypothermia prevention device that will reduce neonatal mortality in Ethiopian hospitals.

Agua Mala en Guatemala

Institution: University of Colorado, Denver
Advisor: Cassandra Howard

Members: Miray Elkedwani, Jonathan Platt, Shreemathi Harikrishnan, Thomas Dean, Odalis Castro, Kyra Flores

There is a high prevalence of mosquito-borne illnesses in tropical low-resource communities. Standing water caused by improper drainage in residential areas serves as a breeding ground for mosquitoes. Children are susceptible to these illnesses when playing around the house. Often treatment is unavailable leading to an increase in mortality rate.
Brachytherapy is a curative treatment for late-stage cervical cancer, but the procedure currently relies on the use of transcutaneous needles that increase the risk of complications from the procedure. We aim to create an applicator for cervical cancer brachytherapy that improves the efficiency of needle placement to improve patient outcomes.

HPV-16 is a major cause of cervical cancer globally, disproportionately affecting low resource settings that don't have the capability to screen and treat those infected. The main barriers to access are the need for complex equipment and specialized technicians, as well as a controlled environment to process samples.

Parkinson disease is a progressive nervous system disorder affecting movement characterized by hand tremors which causes food spillage. It is predominant in the aged with 4% being diagnosed before age 50. Our method aims at reducing food spillage by numbing the trembling effect from the hand.

Every year, in the neonatal intensive care unit (NICU), about 100,000 patients in the US will experience an IV infiltration when the solution inadvertently leaks outside of its vascular pathway. The current protocol for detection is insufficient as the effects of infiltration can lead to irreversible damage within minutes.
Neonates in low-resource settings are at a high risk of acquiring infections due to particulate matter because of their immature immune system and the NICU environment. Tracking these effects is not a current hospital consideration, which is enabled by the lack of accessible air quality monitoring devices in these settings.

Specular microscopes are the current way of examining and assessing the health of the corneal endothelium, but they cost over $40,000 a piece and aren’t portable. Our goal is to create a smartphone-based imaging and analysis platform to universalize access to diagnosis of corneal diseases and dystrophies.

Pressure ulcers are prevented by periodically turning patients, distributing pressure across the body. Hospitals in low-resource areas often face a higher incidence of ulcers due to understaffing of nurses, resulting in them being unable to meet the physical demand of turning patients and not turning them as frequently as needed.

Fifty percent of the world’s population lacks access to basic health care. When available, hospital care is time-consuming and costly. Neonates and infants with feeding dysfunction need a method of gastric enteral access that minimizes displacement frequency and associated complications in order to prevent the need for additional hospital treatment.
Prosthetic Leg for Developing Countries

Institution: Clemson University
Advisor: Dr. Delphine Dean

Member(s): Emily Willis

Of the 30 million amputees residing in developing countries, only 5% to 15% are able to receive a prosthesis. Although there have been many efforts to design low-cost prosthetics for amputees in developing countries, many don’t meet the unique functionality, climate and durability demands essential to amputees in developing countries.

Sensor Technology for Enhanced Prosthesis Production

Institution: Colorado State University
Advisor: Dr. Steve Simske

Members: David Kimmey, Bella Demiranda, Josh Floyde, Stephen Haag, Servando Calderon Felix

The Sensor Technology for Enhanced Prosthesis Production (STEPP) team is addressing the increasing need for prosthetic care in developing countries. A method for faster, more affordable prosthesis production is needed to provide care to more patients. STEPP aims to revolutionize prosthetic manufacturing through an intuitive and effective implementation of technology.

Solair

Institution: Columbia University
Advisor: Dr. Aaron Kyle

Members: Lynn Bi, Chris Shen, Bunmi Fariyike, Asad Saleem, Karina Yeh

Oxygen is a primary therapy in many pediatric and adult conditions, including respiratory-distress syndrome and lower-respiratory infections. However, access to consistent oxygen is inadequate or nonexistent in many healthcare facilities in low-resources settings. Therefore, an affordable, off-grid-enabled, easy-to-operate, and easy-to-maintain method of producing oxygen-enriched air for oxygen-based therapies is needed.

Surgical Simulators

Institution: Boston University
Advisor: Dr. Bharat Yarlagadda

Members: Jacob Ball, Saumya Chugh, Joel Aduba, Mary Angjeli

Within low resource settings there exists inadequate training opportunities and materials for physicians to practice high-risk surgical procedures. Lack of proper training yields high patient morbidity rates and increased medical complications among populations. Surgeons need an affordable, anatomically accurate tool by which they can perfect their procedural acuity.
TMAP

**Institution:** Purdue University
**Advisor:** Dr. Hyowon Lee

**Members:** Jenna Munshi, Vinod Rangaprasad, Diana Sarrico, Gary Chen, Reuben Irizarry Diaz, Kevin Bautista, Ethan Yu

The transmetatarsal foot amputation is common in patients with diabetic neuropathy, ulcers, and peripheral artery disease. Current solutions lack suspension, impair limb health, and allow for proper proprioception of users. Our prosthetic is designed to take into account gait and balance, and provide a safer, more comfortable way of walking.

Vaccine Carrier Redesign

**Institution:** Case Western Reserve University
**Advisor:** Dr. Andrew Rollins

**Members:** Braden Lamberski, Alan Chen, Yuliang Ding, Alexandra Weinhofer, Cindy Wu, Mary Stevenson, Nicole Tartaglia

We are designing a solution to address the delivery of vaccines from health care facilities to patients with the goal of increasing vaccination rates of children in developing countries.

Tug of Words

**Institution:** Rice University
**Advisor:** Dr. Andrea Gobin

**Members:** Belviane Songong, Latane Bullock, Grant Lu, Isabella Garza

Children in low-resource families receive fewer active caregiver engagements in early stages of life. These engagements, or serve and return interactions, are essential to emotional and cognitive development. Our team is designing a wearable device and software that tracks these serve and return interactions between parent and child.

Verti-Fix

**Institution:** Purdue University
**Advisor:** Orlando Hoilett

**Members:** Damen Wilson, Pragna Upputuri, Scott Kenning, Anthony Vukovich, Parker Van Emmerik, Mohamed Ibrahim, Jon Teoli

Elderly patients globally need an effective, affordable, and safe way to be diagnosed with Benign Paroxysmal Positional Vertigo and treated at home to prevent them from traveling long distances to reach a specialist. Our device is for primary care physicians, ER doctors, and at-home patients to diagnose and treat BPPV.
THANK YOU TO OUR SPONSORS!

This program is made possible in part by The Stephen W. Ley Family Endowment for Global Health and The Mehta Family Foundation. Thank you for your generous support!

For more information on how to become a sponsor, please contact: Karen Turney, Director of Development 713-348-4491 | kturney@rice.edu

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