

## ACS 2022 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

### Challenges in Surgical Education

#### **GlobalSurgBox: An innovative, affordable, portable surgical simulator for all trainees**

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**Background:** Simulator training is increasingly recognized as a critical component of a robust surgical education. Changes in surgical training environments due to work hour restrictions, operating room efficiency, and reducing errors has led to fewer learning opportunities for trainees, resulting in decreased operative exposure and hands-on skill practice. Simulation promotes practice outside of the operating room, circumventing commonly faced obstacles to achieving operative proficiency during training.

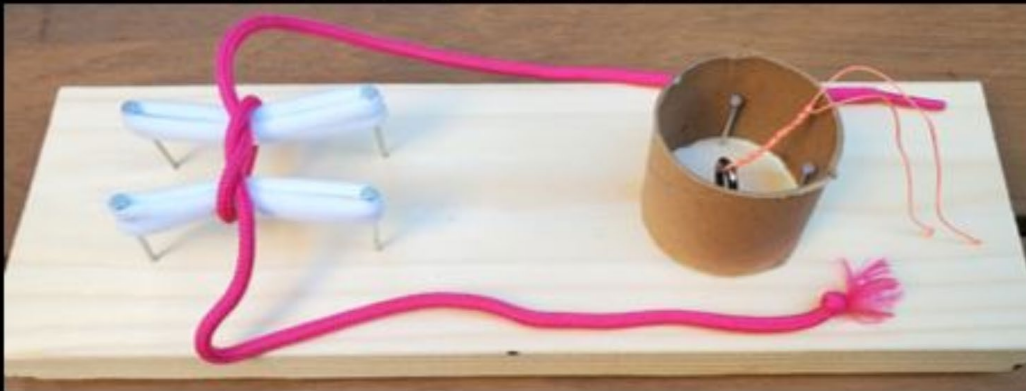
**Current Challenges:** Despite recognition of the importance of simulation in improving technical skills, implementation of these platforms are often limited by affordability, portability, and accessibility. Many platforms are high-fidelity platforms, which traditionally offer the benefit of close similarity to operating room environments or tissues. Unfortunately, this also leads to significant barriers of cost, limiting the number of simulators available to residents, and added difficulty in replenishing materials used for the simulator. These barriers become even more pronounced in low-income countries with limited healthcare resources, as the current era of simulation-based training often requires substantial investments of time, money, and teaching personnel.

**Need of Innovation:** To overcome these barriers, we developed the GlobalSurgBox: a portable and inexpensive surgical simulation trainer that individual trainees can own, and can be easily adapted to any level of training. The GlobalSurgBox was specifically designed to help overcome resource and time constraints, allowing easy assembly, distribution, and implementation in any resource setting. The GlobalSurgBox was designed as a compact and portable trainer that fits within a 12.5-inch toolbox and costs approximately \$25 to create. All of the materials can be found at online retailers and local home improvement stores. We have successfully trialed this simulator in two training programs, the University of Colorado Hospital general surgery training program, and the Tenwek Hospital in Kenya. We hope to continue working on modules for further implementation in more settings globally.

A. GlobalSurgBox



B. Medical Student Module



C. General Surgery Resident Module



## D. Cardiothoracic Surgery Fellow Module

