researchers develop innovation that provides protection during surgery in non-sterile environments [1]

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San Juan, Puerto Rico — Researchers from the Biomedical Innovation Center at the Medical Sciences Campus of the University of Puerto Rico have obtained a second patent for their

invention, the *Dynamic Surgical Fenestration*, which is designed to provide a surgical workspace that limits airborne contamination.

The invention, presented to the press on September 10, 2025, consists of a transparent mechanical fenestration system (window) that can be opened and closed as needed, depending on rapid environmental changes. The mechanism can be as simple as pulling cords to open and close the window, or as sophisticated as activating it through radio frequency identification technology. This simple device is adaptable for use in patient transport systems (e.g., ambulances) as well as first aid kits. The system is placed directly over the injury, providing a window for observation and quick access to the wound. In acute surgical procedures, it reduces the risks associated with emergency rooms by lowering the need for a sterile operating room.

According to **Dr. Abe Schwartz**, Scientific Director of the Biomedical Innovation Center and lead inventor of the patent, *"This innovation was first conceived by observing surgical processes performed in highly contaminated environments on battlefields. We are also exploring civilian applications in which medical personnel can continuously monitor injuries during patient transport in ambulances and/or MediaVac helicopters."*

Surgeon **Dr. Anwar Abdul**, who heads the Surgical Research Laboratory at UPR's School of Medicine and is co-inventor of the innovation, stated, *"The device provides a simple and effective solution for situations that may occur in the emergency room or in areas where the environment is highly contaminated, for example, on a battlefield, during a volcanic eruption, or a forest fire."*

"This new invention offers undergraduate students the unique opportunity to become familiar with the innovations developed by our faculty and the process of creating medical devices that minimize health complications in contaminated environments," said **Dr. Emma Fernández Repollet**, Executive Director of the Biomedical Innovation Center.

Dr. Schwartz also indicated that the proof of concept has been demonstrated with both simple and sophisticated prototypes. He further mentioned that a third patent has been submitted to the United States Patent and Trademark Office (USPTO) and that an international patent application is also in process. He noted that the next stage will involve microbiology studies to determine the effectiveness of this innovation under different environmental conditions. Commercialization efforts will focus on negotiating licenses for this innovation with manufacturing companies interested in the product and its impact on the healthcare field.

U.S. Patent: 12,144,577 Bl, Issued on Nov 19, 2024, MEDICAL DRAPE SYSTEM.
