Washington University in St. Louis
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VERSATILE AIRWAY MANAGEMENT SYSTEM TO REDUCE EXPOSURE TO AEROSOLIZED SARS-COV-2 AND OTHER PATHOGENS

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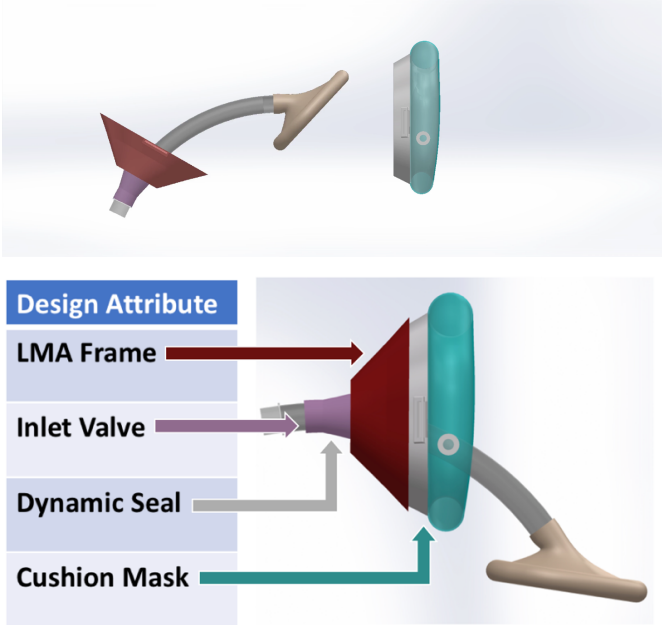
Technology Description

Researchers in Dr. Mohamed Zayed's laboratory have developed a versatile, sealable valve system for airway management devices that can protect healthcare workers by reducing their risk of exposure to aerosolized SARS-CoV-2 and other pathogens during risky pulmonary procedures.

Critically-ill patients with COVID-19 often require ventilation and other pulmonary procedures that can aerosolize virus particles. This increases both the risk of disease transmission and the need for personal protective equipment (PPE). Current airway management devices have inadequate seals that fail to protect healthcare workers from these aerosolized viruses. This invention addresses that concern with a balloon valve that provides a reliable, non-rigid, airtight seal. This seal is designed to provide a closed airway system that mitigates leakage and spread of aerosolized virus particles in a range of airway management devices. In addition, these devices can accommodate scopes of various diameters and could potentially incorporate features for safe viral collection and sampling. Specific applications for the system includes airway access procedures such as bronchoscopy, intubation with endotracheal tubes (ETT), and ventilation with laryngeal mask airways (LMA). This technology could potentially protect medical workers to improve care for coronavirus infections as well as respiratory viral pandemics that may arise in the future.

"A.I.R. Seal" allows for quick, easy ventilation of COVID-positive patients through a laryngeal mask airway (LMA) that is dynamically sealed to block viral aerosol transmission.



Stage of Research

The inventors developed a benchtop prototype of the LMA mask device (for use in short-term airway intervention). Ongoing testing of effectiveness testing is currently underway.

Applications

- **Airway management devices** – Adapters and masks with a sealable valve designed for infection control during procedures such as:
  - Bronchoscopy
  - Long-term airway intervention with ETT
  - Short-term airway intervention with LMA

Key Advantages:

- **Reduces healthcare workers' infection exposure:**
  - Designed to mitigate leakage of aerosolized SARS-CoV-2 particles and other pathogens during risky pulmonary procedures
  - Valve system is easy to operate and maintains a reliable seal during procedural manipulation
  - Potential to reduce demand on limited supply of PPE
- **Versatile:**
  - Various designs to accommodate use with bronchoscopes of different sizes as well as ETT and LMA devices
  - Potential for adding an access port for viral detection and sampling

Patents: US 20220040429

Related Web Links: Zayed Lab