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Two-Sided Inflatable Prone Positioning Device

Unmet Need

Acute respiratory distress syndrome (ARDS) is a life-threatening condition characterized by poor oxygenation and lung tissue inflammation that affects more than quarter of a million people in the US annually. This results in an increased cost of approximately \$9-16 billion/year to the U.S. healthcare system, with \$115,000 additional cost per case. These numbers have increased exponentially owing to the prevalence of respiratory problems associated with COVID-19. Prone positioning is the least invasive evidence-based treatment for patients suffering from ARDS that demonstrates improvement in both 28-day and 90-day mortality. Evidence consequently suggests a decrease in the number of days patients undergoing this therapy spend on the ventilator and is thus strongly recommended by all major critical care societies.

Despite this endorsement, barriers to implementing prone positioning are vast. Excess patient weight, nursing shortages, expense of current solutions and lack of awareness result in only 10-33% of candidates receiving this life saving therapy. The most common current practice in place is the manual approach. This requires anywhere from 5-7 staff members to achieve the therapy. This approach is inefficient, time-consuming, requires many resources and takes medical personnel away from other critically ill patients. Opposingly, more sophisticated options are associated with tedious troubleshooting, prohibitively expensive, intimidating, and require installation to be compatible with existing ICU facilities.

Technology

A new Duke technology, called PositionAir, has been developed to address this need and to prompt prone positioning as a therapy. The device consists of two identical inflatable pads to be placed on the patient bed. The pads are connected to a pump box that would power on, allow air pressure to lift, turn and catch the patient to a 180 rotation. In addition, the device manages the majority of patient load and requires as little as 3 staff members to complete the process. It is easily integrated with current patient care practice standards and positioning tactics with the same intended use, but a more achievable method than existing predicates.

