Ventilator Sensors that Identify Blocked Tubes to Reduce Misuse of Bronchodilator Drugs

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Technology description

Noninvasively Measures Airway Resistance and Work of Breathing to Minimize Inappropriate Treatment of Ventilator Patients

These sensors estimate airway resistance and work of breathing for ventilator-dependent patients to aid clinicians in their diagnosis and treatment. Approximately 800,000 hospitalized Americans require mechanical ventilation every year. When patients receive ventilator support, healthcare providers track respiratory resistance to determine if drugs called bronchodilators are needed. These drugs relax the bronchial muscles and increase airflow to the lungs, ensuring that patients' bodies take in adequate oxygen. However, not all cases of airway resistance require the use of bronchodilators. Sometimes respiratory resistance is caused by partially blocked ventilator tubes. Using bronchodilators in such cases does not address the problem and can cause side effects such as nervousness, restlessness and trembling.
Researchers at the University of Florida have developed sensors that specifically measure a patient's airway resistance, enhancing treatment by preventing the misuse of bronchodilators. These sensors, which can be incorporated into ventilator tubes, will immediately alert healthcare providers to obstructions.

Technology

University of Florida researchers have developed ventilator sensors that directly measure a patient's respiratory airway resistance and alert healthcare providers to obstructions in the ventilator tubes. Clinicians now estimate airway resistance changes based on total respiratory resistance changes, which can lead to prescriptions of bronchodilators when the ventilator tube simply need to be cleaned or replaced. By identifying ventilator tube obstructions, these sensors could eliminate up to 25 percent of bronchodilator misuse. The sensors are placed along the breathing circuit to measure pressure over time and calculate airway resistance.

Application area

Ventilator sensors that notify healthcare providers to airway resistance problems caused by blocked ventilator tubes, ensuring these cases are not treated with bronchodilators

Advantages

Measures ventilator patients' airway resistance in real time and identifies when the cause is a partially blocked ventilator tube, allowing for appropriate medical interventions
Provides diagnostically relevant information, improving health outcomes
Eliminates the need to pause patient breathing to assess respiratory resistance, enhancing patient comfort

Institution

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