RESPIRATORY MOTION
Inspired Innovation

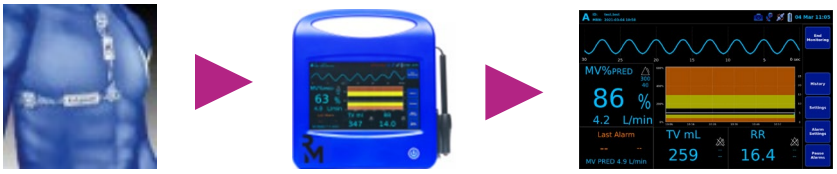
ExSpiron™ Minute Ventilation Monitoring

Measuring Respiratory Volume and Rate on Non Intubated Patients

Growing Gap in Respiratory Safety and Cost

Respiratory failure can happen anywhere in the hospital and its early detection can often make the difference between life and death. Continuous monitoring of respiratory status can provide an early warning of impending respiratory failure by identifying the onset of respiratory compromise as well as other pathologies such as sepsis or sleep apnea. Minute Ventilation (MV) is the most direct measure of respiratory status and thus the earliest indicator of respiratory compromise. Anesthesiologists and intensivists have been able to simultaneously monitor and control MV in intubated patients for decades but have never before been able to measure MV for non-intubated patients.

Respiratory Motion's ***ExSpiron*** Minute Ventilation Monitor provides continuous MV measurements for any patient. This is especially important for patients receiving opioids or those that have risk factors for respiratory failure such as COPD, Congestive Heart Failure or sepsis.



Recently the ***ExSpiron*** Minute Ventilation Monitor received 4-Stars1 by an independent, non-profit technology assessment organization, the highest rating and a star above the two leading-brand capnography devices it was compared against. The study's findings suggest that ExSpiron, "provides an effective way to detect respiratory depression, far earlier than current monitoring technology and offers a better patient experience."

Peer-reviewed clinical studies provide a solid foundation of the clinical utility of the measurements provided by the ***ExSpiron*** Monitor:

- 90% accuracy[2,3]
- Ease of use by staff [4,5]
- Earliest warning: ExSpiron shows Respiratory Depression an average of 71 min before O2 Sat[6]
- MV most sensitive: Respiratory Rate (RR) misses 80% Respiratory Depression (RD) which was identified by ExSpiron[7]
- Capnography useful for intubated patients but not "clinically relevant" for non-intubated patients[8]

CLINICALLY PROVEN AND ACCEPTED:

- Over 100,000 tests in 6,000+ patients across PACU, GHF, ICU, OR, procedural sedation and outpatient settings
- >30 published articles in key clinical journals
- >300 presentations at peer-reviewed conferences
- World-Class Institutions: Brigham & Women's, Cleveland Clinic, Duke, Johns Hopkins, Mayo Clinic, MGH, Boston's Children's, University of Texas, and University of Vermont

Whereas other technologies address the "Failure to Rescue", meaning that a patient is identified just-in-time before it is too late to rescue, the ***ExSpiron*** provides an earlier warning and the opportunity to, "Avoid the Need for Rescue." This provides both a safety advantage as well as a marked cost savings. Detecting earlier changes in patients' respiratory status, particularly those receiving opioids or sedatives without the discomfort and unreliability of capnography or the overwhelming number of false alarms from pulse oximetry will help improve patient safety, comfort, and satisfaction while lowering the overall cost of care.

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Potential Safety and Economic Impact in Multiple Clinical Settings

*The economic benefits profiled below have been derived from a return-on-investment calculator which averaged actual input from several hospital systems and data specific to the **ExSpiron** monitor. These cost benefits are recognized after purchase of both monitors and consumables, while providing an important safety benefit. A return on investment can be customized for your facility.*

	Safety Concern	*Preventable Cost*	*Potential Benefit with ExSpiron*	*Potential Economic Benefit*
PACU	• 30% of all PACU patients have respiratory compromise resulting in prolonged stays. • Lack of objective data compromises respiratory assessment. • Opioid induced respiratory depression due to blind dosing[9]	• PACU delays $400/ hour • Respiratory Interventions • Unplanned escalation in level of care ($1,000-$8,000)	• Reduces PACU LOS: up to 1.3 hours[6] • Identifies patients at risk for respiratory compromise to guide follow on care • Faster throughput for stable patients	• **$24,100/yr cost avoidance per device** • Up to $32/ patient after monitor and consumable purchase
General Floor	• 62% of all ERT calls occur within 12 hours of PACU discharge. • 48% of unplanned ICU transfers are due to respiratory conditions. • 40-50% of arrests are respiratory based. • Late diagnosis of Respiratory Compromise	• $43,000/ Code Blue event • $4,500+/ICU day • $1,500/ventilator day • Increased LOS 8-14 days ($18,000-50,000) • Respiratory Interventions	• Low MV reported 71minutes before SPO2 drops[6] • Drives earlier action, minimizing Code Blue Calls, and unplanned escalation in level of care • Prevents unexpected deaths	• **$14,300/yr cost avoidance per device** • Up to $57/patient after monitor and consumable purchase
ICU	• Lack of quantitative assessment post-extubation delays decision to extubate, with increased ventilator days VAP*, ICU days • VAP* directly related to number of ventilator days. • Early ICU discharge can lead to unplanned ICU readmissions with 25-30% mortality. • Increase in mortality and ICU stays due to reintubation.	• Pneumonia (VAP* and HAP* with avg. non reimbursable cost of $39,828/patient) • Inadequate pain and sedation management leading to delirium and increased LOS[11] • Reintubation rate (avg.10%) • Added ventilator and ICU days (1.5-2 days)	• Promotes timely extubation and reintubation decisions resulting in fewer ventilator days[11] • Drives better therapeutics with decreased ICU LOS • Potentially saves 1..5-2 ventilator days around the same time as extubation	• **$33,044/yr cost avoidance per device** • Up to $136/patient after monitor and consumable purchase
MAC/Procedural Sedation	• Sedation leads to 60% adverse events. • Capnography & SPO[2] are in use, but inadequate to prevent Respiratory Depression. • Respiratory Rate alone misses >80% of Respiratory Depression [7] • Remote environments provide potentially fewer resources.	• Procedure room;recovery room delay ($58/min:$400/hr • Respiratory Interventions unplanned escalation in level of care ($1,000-8,000)	• MV monitoring is more clinically relevant than CO[2] in non-intubated patietns[8] • Better titration of sedatives and anesthetics reduce LOS in procedure room and post procedure area	• **$26,844/year cost avoidance per device** • Up to $18/ patient after monitor and consumable purchase

*Definitions: VAP: Ventilator Associated Pneumonia, HAP: Haopital acquired Pneumonia

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