Assessment of a Non-Invasive, Real-time Respiratory Monitor to be used in the Treatment of Pain.

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Methods
- 96 subjects, 306 visits, 7226 tests
  - Age range: 19 – 84 years
  - BMI range: 16.4 – 50.9

Introduction
- Post-operative analgesic titration is a fine balance between patient comfort and respiratory failure
- Existing respiratory indicators fail to provide accurate, time-sensitive assessments
- A novel Respiratory Variation Monitor (RVM) continuously tracks 3 parameters of respiratory mechanics in real-time:
  - Minute ventilation
  - Tidal volume
  - Respiratory rate
- RVM has the potential to promote effective management of pain and improved patient safety

Sample Data
- Figure 1. Sample plots of simultaneous RVM measurement (top) and spirometric volume (bottom) curves against time for a select subject. Left column graphs represent normal breathing ($r=0.99$). Middle column graphs represent erratic breathing ($r=0.98$). RVM is plotted against volume for one subject (right column). Note the linearity across breathing maneuvers and strong correlation coefficients.

Results
- RVM data correlated strongly with spirometric volume data
- Mixed effects ANOVA analysis (subject is a random effect) discriminated ($p < 0.001$) for dual versus single lead placements
- RVM data was found adequate for advanced analysis of respiratory curve parameters and complexity

Conclusions
- RVM data correlated strongly with spirometric volume data across a wide variety of subjects
- RVM technology projects utility in pain and opioid management in patients at risk for respiratory depression
- RVM offers clinical applicability as a turn-key, cost-effective tool with potential to become a new standard of care, both increasing patient safety and decreasing cost-of-care.
- Further studies are needed to determine the utility and accuracy of such a technology in the post-operative setting

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