White Paper - Comparing RespiraSense to traditional methods of respiratory rate monitoring

Respiratory Rate (RR) is an important predictor of cardiac arrest\(^1\), respiratory adverse events\(^2\) and intensive care unit admission\(^3\). The standard technique of respiratory rate monitoring is manual observation, by a healthcare professional, of thoracic and abdominal displacements that are indicative of breathing. This technique is not accurate and cannot offer comprehensive respiratory rate parameters over time\(^4\).

RespiraSense is a new innovative and patient friendly technology. Designed with ease of use and patient comfort in mind, the RespiraSense offers continuous and comprehensive Respiratory Rate monitoring. This will give confidence to healthcare providers so that accurate RR information can be used for early detection of patient deterioration.

“Enabling healthcare professionals to fully utilise respiratory rate as an early indicator of patient deterioration will significantly improve the ability to prevent adverse events. However, confidence in the displayed rate is crucial. RespiraSense is designed to give this confidence, thus allowing healthcare professionals to take prompt action when abnormal rates are detected, resulting in an improved delivery of healthcare.”

– Myles Murray, CEO PMD Solutions

PMD Clinical Investigation

PMD Devices carried out a Clinical Investigation to measure the efficacy of the RespiraSense versus ECG derived respiratory rates and nurse evaluation rates\(^5\).

A total of 48 patients recovering from anaesthetic were recruited, yielding 115 evaluable data points each representing 15 minutes of averaged respiratory rates, and a corresponding nurses evaluation during that period.

“The 95% confidence interval (CI) for the mean difference in average RR between PMD and ECG was calculated to be [-0.73, -0.08]... Neither confidence interval for the mean include the difference of 3 bpm which is considered of clinical relevance.”

“The Pearson Product-Moment Correlation Coefficient of 0.84 demonstrates a very strong relationship between PMD and ECG in monitoring RR”

– Peter Lee MB, FCARCSI, MD

PMD RespiraSense benchmarking

PMD also conducted in house testing of the RespiraSense technology to benchmark against existing hospital infrastructure\(^6\).

Six subjects were studied while both wearing the PMD RespiraSense Consumable and being monitored by using a Capnagraph. Each subject remained seated, performing normal office tasks over the course of one hour while being monitored.

For 15 minute intervals (22 data points), the two methods have a correlation coefficient of \(R = 0.96\) indicating a very high level of correlation. RespiraSense has bias of -0.6 breaths per minute versus the Capnagraph.

“We demonstrate a strong correlation between RR monitored by the RespiraSense device with both ECG- derived and manually observed RR in 48 post-surgical patients.” – Peter Lee MB, FCARCSI, MD
How it Works

The RespiraSense non-invasively and discreetly monitors the patient's respiratory rate using an easily-applied adhesive sensor. Single-application, single-use from admin to discharge, continuous and comprehensive monitoring. Design-optimised for patient comfort, ease of use and ease of cleaning.

Enhancing existing manual methods of respiratory rate monitoring to aid in the early detection of patient deterioration.

References

[3] Cardoso et al, (2014) Respiratory rate at intensive care unit discharge after liver transplant is an independent risk factor for intensive care unit readmission within the same hospital day: A test case control study, Journal of Critical Care