Abstract P137 Figure 1 Example 19F images (coronal views) Acquired during an 18s breath-hold after 3 deep gas inhalations.

REFERENCES

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P138 KINETICS OF INTRATHORACIC PRESSURE CHANGE FOLLOWING ADMINISTRATION OF CPAP

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Introduction An understanding of the changes in intra-thoracic pressure in response to application of Continuous Positive Airway Pressure (CPAP) is important in the study of thoracic and ventilator mechanics and device tolerability. It is unclear how quickly intra-thoracic pressure, measured directly with balloon catheters, responds to a change in CPAP. The aim of this study was to evaluate the kinetics of pressure stabilisation in healthy subjects.

Methods Mouth pressure (Pmo) was measured directly at the facemask of a NIPPY3 CPAP system, oesophageal pressure (Poes) and gastric (Pga) pressures were measured with balloon catheters in healthy subjects (n=7), seated at rest, with 10 min spontaneous ventilation followed by 20 min at CPAP of 5 cm/H₂O, then 20 min at CPAP 10 cm/H₂O, then 10 min no CPAP.

Results Pmo was lower than the setting for CPAP on the NIPPY3 machine; for CPAP=5 cm/H₂O mean Pmo=4.67 cm/H₂O, SD 0.29 cm/H₂O; for CPAP=10 cm/H₂O, mean Pmo=9.09 cm/H₂O, SD 0.3 cm/H₂O. Poes with 5 cm/H₂O was higher than with no CPAP; 3.31 v 0.13 cm/H₂O, p<0.05; with 10 cm/H₂O, 5.16 v 3.31 cm/H₂O, p<0.05; with CPAP back to 0 cm/H₂O, 5.18 v 1.1 cm/H₂O, p<0.05. There was a wide variability of gastric pressures both with and without CPAP; no significant changes in Pga with CPAP. Stabilisation of Pmo and Poes pressures after CPAP settings were changed occurred within 2 min for change in CPAP from 0–5 cm/H₂O, 5–10 cm/H₂O, and 10–0 cm/H₂O with Pmo maximum time to stabilise 80 s, Poes maximum time to stabilise 86 s. Pga stabilisation took longer; for CPAP setting change 0–5 cm/H₂O, time to stability for Pga was 111–470 s; for CPAP 5–10 cm/H₂O, 46–183 s; for CPAP setting change 10–0 cm/H₂O, 37–135 s.

Conclusions In healthy subjects the kinetics of thoracic pressure stabilisation, following application of CPAP, is highly variable. Gastric pressure takes longer to stabilise and varies more than Pmo and Poes. This may reflect variation in diaphragm tonicity, gastric contraction or abdominal wall tone. These

variable time constraints need considering when evaluating CPAP intervention. Subject variability in gastric pressure may contribute to reduced tolerability in some individuals and requires further study.

P139 A RANDOMISED COMPARATIVE STUDY OF COUGH PEAK EXPIRATORY FLOW (CPEF) USING FULL FACE MASK VS MOUTHPIECE INTERFACES IN HEALTHY SUBJECTS

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Background Cough Peak Expiratory Flow (CPEF) is a respiratory muscle function test designed to assess the ability to clear airway secretions adequately. Present practice requires CPEF to be measured using a mouthpiece, which has proven problematic in patients the neuromuscular disease(s). The study aimed to determine the effectiveness of using a facemask *vs* mouthpiece in measuring CPEF.

Hypothesis CPEF measured via an Interurgical Anaesthetic Full-Face Mask will provide comparably similar (CI 0.95) Results to those obtained using a flanged mouthpiece.

Participant Population Healthy participants were recruited into the study through faculty newsletters, social media advertisements and random convenient sampling of network connexions. Participants were screened, following ethical approval, using a specifically-designed Pre-screening Medical Questionnaire (PSMQ) against an Inclusion criterion, before inclusion to the study.

Methods Testing procedure ensured standard spirometry position was adopted. The participant was asked to expire to residual volume (RV), followed by a rapid inhalation to total lung capacity (TLC) where a forceful cough manoeuvre was made. Procedure was repeated at least 3 times, with 45 s rest between attempts. A maximum of 8 attempts per interface was allowed, with a 10 min change-over period between interfaces. A students 2-sample t-test, Bland-Altman and regression analysis were employed to statistically analyse the data. Randomisation occurred using the `exce RAND` command on the sample ID's.

Results 60 healthy subjects were recruited, of which 58 participant's Results were deemed appropriate to study. The mean result of each interface was analysed to indicate no significant differences of CPEF measurements in healthy subjects (CI 95%, p=0.971). There were no significant differences between Age and Gender (CI 95%, Age p=0.453, Gender p=0.902)