Results Five studies involving 73 patients were included in this review. Four studies (59-subjects) compared the efficacy of nebulisers against MDI, and one study (14-subjects) compared ELB against MDI. The review found that all three modes were effective in significantly reducing both PIP and R_{aw} , with two studies suggesting that nebulisers appear to be more effective than MDI (GRADE – moderate). ELB was found to be especially effective as a rescue therapy when conventional management had failed (GRADE – moderate). The studies were limited by small sample sizes, large variability in outcomes measures, incomplete reporting and a high degree of heterogeneity; thus, precluding a meta-analysis. The risk of bias ranged from low to uncertain across most domains.

Conclusions A systematic review of RCTs found that there was insignificant evidence to assert the superiority of any one mode of bronchodilators over the other, and thus a balanced and nuanced approach to managing acute bronchospasm should be contextualised to the individual needs and best-interest of the patient using a multi-modal approach. Further high-quality RCTs with larger samples sizes, preferably comparing all three modalities are required to conclusively provide a tangible answer.

P128 AUTOMATED VIDEO MONITORING OF PATIENTS' SPONTANEOUS BREATHING DURING HIGH FREQUENCY JET VENTILATION

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Introduction One important problem in anaesthetic equipment is the measurement of patients' spontaneous breathing during artificial ventilation in the immediate postoperative period. The current paper presents an investigation into using video processing technology to determine the accuracy of spontaneous breathing evaluation for patients during high frequency jet ventilation (HFJV). We call this technology remote body plethysmography (rBPG).

Materials and Methods The 6 patients (male and female) involved, aged between 42 and 70, had undergone operation of the thoracic cavity. Each patient provided written informed voluntary consent prior to study procedures. In the immediate postoperative period, patients enter the intensive care unit, and HFJV is administered for a time between 30 min up to 2 hours or until full reestablishment of adequate spontaneous breathing is made. The HFJV procedure was performed by the ZisLine JV100A device (Triton Electronics Systems Ltd., Russia, registration No: 2010/08739). The reference impedance pneumography signal was provided by an MP 6-03 monitor (Triton Electronics Systems Ltd., Russia, registration No: 2007/00597). The video recording was performed at a distance of 80 cm. Low-cost Logitech C920 webcams with 30 Hz sampling frequency and a 640 × 480 pixel resolution were used. The rBPG signal was measured in real-time with the use of original software.

Results According to rBPG the mean error of respiration rate estimation did not exceed 0.053 Hz (3.2 breath per minute) with a standard deviation of less than 0.04 Hz (2.45 breaths per minute). The example of respiration rate estimation presented in figure 1. In 4 cases, the rBPG and impedance pneumography breath frequency evaluation started at the same

Abstract P128 Figure 1 rBPG signal spectrum with examples of respiration rate estimation during the HFJV.

time. In 2 cases the rBPG frequency estimation started more than 1 min earlier.

Conclusion rBPG provides reliable and early determination of spontaneous breathing during HFJV. Therefore, it can be recommended as an additional method of non-invasive spontaneous breathing monitoring to improve the safety of patients during HFJV.

P129 IMPLEMENTING TARGET RANGE OXYGEN IN CRITICAL CARE (TROCC); A BASELINE SURVEY AND PILOT STUDY

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Iatrogenic hyperoxaemia is common on Critical Care Units (CCUs) throughout the world and high blood oxygen levels have been associated with adverse outcomes including increased mortality. We have commenced a pilot quality implementation study to analyse the views of Critical Care staff regarding oxygen therapy and to change practice to ensure that all patients in the Critical Care Unit have a prescribed target oxygen saturation range. 33 CCU staff responded to an online questionnaire (16 doctors, 7 nurses, 9 physiotherapists, 1 ACCP). 76% thought that slightly too much oxygen was used on the unit but only 53% favoured a formal prescription for oxygen for all patients. For ventilated patients not at risk of hypercapnia, 83% would favour a target range of 94%–98% and 10% would opt for a target range of 90%–94%. For patients at risk of hypercapnia, all respondents favoured a target range of 88%–92%. A baseline audit of practice on the unit studied 54 patients (28 on ventilators) over one month prior to the implementation of a programme of change. 85% of audited patients (46 of 54) had a formal oxygen prescription with target range. Forty patients had target range 94%–98% and six patients had target range 88%–92%, all

prescriptions were judged to be appropriate. The mean PaO₂ on blood gas samples was 13.1 kPa compared with 15.1 kPa in 2005 and 14.9 kPa in 2010. Mean PaCO₂ was 5.3 kPa. The mean SpO₂ (pulse oximetry) was 96.8% [median 97%, range 91%–100%]. 82% of SpO₂ values were within the target range but four of six patients with target range 88%–92% were at least 2% above this range. Attitudes and practice in our Critical Care Unit have changed in the past decade and hyperoxaemia is less common now. However, practice still lags behind the declared ambition of our Critical Care colleagues to maintain normoxaemia for most patients. We have instituted changes to CCU practice in May–June 2017. These changes will inform the design of a systematic randomised cluster implementation study using a step-wedge design to implement current best practice in a wide range of Critical Care units.

P130 AUTOMATED VIDEO MONITORING OF SPONTANEOUS BREATHING RECOVERY DURING THE HIGH FREQUENCY JET VENTILATION

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Introduction Automatic evaluation of spontaneous breathing recovery for patients during artificial ventilation is one of the central problems in the early postoperative period. The basic criteria for adequate breathing recovery are rhythmic movements and respiration muscle tone. The current paper presents the possibilities of using video processing technology to determine spontaneous breathing recovery in patients during high frequency jet ventilation (HFJV). We refer to this technology as remote body plethysmography (rBPG).

Materials and Methods The 16 subjects (male and female) involved in the experiment, aged between 24 and 76, had undergone operation of the thoracic cavity. Each patient provided written informed voluntary consent prior to study procedures. Immediately after operation, patients enter the intensive care unit, and have HFJV administered for a time between 30 min up to 2 hours or until the full recovery of muscle tone, consciousness and adequate spontaneous breathing is made. The HFJV was performed by the ZisLine JV100A device (Triton Electronics Systems Ltd., Russia, registration No 2010/08739). The reference respiration rate signal was measured by impedance pneumography with an MP 6–03 monitor (Triton Electronics Systems Ltd., Russia, registration N2007/00597). The patient body video recording was performed at a distance of 80 cm using two Logitech C920 webcams with 640 × 480 pixel resolution and 30 Hz sampling frequency. The original video processing software was used to rBPG signals assessment in real-time. The chest and epigastric movements were processed independently.

Results The Results of rBPG measurement showed that in most cases the process of restoring spontaneous breathing begins with diaphragmatic breathing. The thoracic breathing recovery can be quantified through the measurement of chest movement amplitude. The example of breathing recovery presented in figure 1. The amplitude is raised alongside muscle tone recovery.

Conclusion rBPG provides readings of measurements of diaphragmatic and thoracic breathing from epigastric and chest

regions. It allows the relative contribution of each region in total respiration to be quantified. Thus, rBPG can be used for assessing respiration muscle tone recovery and for measuring respiration parameters. It can be used to accurately select the appropriate time for turning off the ventilator and for extubation.

Abstract P130 Figure 1 The chest and abdomen movement amplitude alongside spontaneous breathing recovery.

P131 WEANING OUTCOMES FROM TRACHEOSTOMY VENTILATION IN AN ACUTE RESPIRATORY CARE UNIT (ARCU): A THREE-YEAR EXPERIENCE

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Introduction Patients who had tracheostomy in intensive care unit (ICU) as part of acute admission and are slow to wean from ventilation are admitted to our acute respiratory care unit (ARCU). We evaluated the long-term outcomes of attempted weaning from ventilator support in terms of underlying diagnosis, comorbidities, length of stay (LOS), level of support at discharge and one year survival.

Methods Twelve patients admitted to ARCU as a step-down from ICU between January 2014 and December 2016 were included. Patients were identified using discharge database and data was collected from electronic records and patient notes. Patients were excluded if they had tracheostomy inserted on a previous admission.

Results The patient demographics, length of stay on ARCU and primary diagnosis leading to respiratory failure requiring intubation and subsequent tracheostomy and the LOS on ICU and ARCU are described in Table 1. All but two had significant other comorbidities including neuromuscular disorders, COPD, cardiovascular disorders and OSA. No patients died in hospital. Eight (67%) patients were discharged without any ventilatory support after decannulation. Two (17%) required overnight ventilation and were discharged with tracheostomy ventilation. One patient was transferred to the neuro rehabilitation unit and one to a different ARCU with tracheostomy (self ventilating). Complications during weaning included pneumonia, pneumothorax, delirium, persistent secretions/mucus