Methods Retrospective analysis of a cohort of patients with completed PPS in a national tertiary referral centre who completed the PPS self-management programme from 2006 to 2019.¹ Physical symptoms were assessed via the Index of Post-Polio Sequelae (IPPS) questionnaire. Multi-nomial logistic regression was used to assess IPPS sub-domains of pain, atrophy, bulbar and temperature changes in relation to SDB diagnoses (no treatment; OSA; HRF) using HRF as reference group. Age and symptom score presented with mean and range.

Results 168 participants (108 female) were included: 136 required no treatment for SDB (age: 62.8; 34–85), 20 (11.9%) with OSA (60.0; 43–73), 12 (7.1%) with HRF (64.7; 47–79). HRF suffered greater bulbar symptoms (score out of 10) compared to no treatment group (4.5(2–8) vs 2.7(0–10)) but was no different to OSA (4.5 vs 4.3(0–8)). No significant relationship was found between pain, atrophy and temperature sub-domains to SDB diagnoses in multi-nomial regression analysis (table 1).

Conclusion Bulbar symptom domain in IPPS (including respiratory symptoms) predicted diagnosis of SDB independent of other symptom domains including general muscle atrophy. However, it does not differentiate between OSA and HRF. Patients with any bulbar or respiratory symptoms should be referred for SDB assessment with particular focus on hypercapnic respiratory failure.

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P14 THE ROLE OF A VENTILATION MULTIDISCIPLINARY TEAM MEETING (VMDT) IN OPTIMISING CRITICAL CARE RESOURCE-USE

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Introduction Critical care beds are a scarce, valuable resource needing optimisation. Discharge delays result in high occupancy rates, reduced service efficiency and responsiveness, reduced bed availability and increased costs. Number/proportion of critical care level 1 bed days (table 1) were, therefore, highlighted as an NHS quality indicator. Discharge strategies are required to prevent transfer delay of patients without level 2/3 bed day needs. We previously reported a reduction in level 1 bed days and discharge delay following introduction of a weekly physician-led Ventilation Multidisciplinary team meeting (VMDT) (April 2014).¹ Organisational changes have since lead to VMDT cessation (August 2017). We aimed to investigate the impact of VMDT cessation on level 1 bed-days.

Methods Local ICNARC data was analysed before and after VMDT cessation, ((1/8/2014–31/8/2016; Period 1) and (1/8/2017–31/07/2019; Period 2), respectively). Delay in discharge was defined as critical care patients with level 1 needs remaining in critical care >24 hours.

Results There was an increase in number of level 1 bed days in critical care after VMDT cessation from 45/767 discharges (5.9%) in period 1, to 75/818 discharges (9.2%) in period 2 ($p < 0.002$). This corresponded with an increase in delayed

Abstract P14 Table 1 The 2001 Department of Health (UK) definitions of critical care levels

Level 0	Normal ward-based care in an acute hospital
Level 1	Patients at risk of deteriorating or those relocated from a higher level of care.
Level 2 [also known as 'High Dependency Units' (HDU)]	Patients that may need more detailed frequent observation or intervention, including support for single failing organ support.
Level 3 [also known as 'Intensive Care Units' (ICUs) or 'Intensive Therapy Units' (ITUs)]	Patients that require advanced respiratory support alone ± multiorgan support.

Department of Health. Comprehensive Critical Care: a review of Adult Critical Care Services. May 2000.

discharges from 33 (4.3%) in period 1, to 96 (11.7%) in period 2 ($p < 0.001$).

Conclusions A reduction in Level 1 bed-days following VMDT introduction was previously demonstrated,¹ without similar contemporaneous reduction in the similarly sized sister hospital, under same hospital management with identical policies, but no VMDT.² Our present results, demonstrating increased level 1 bed days following VMDT cessation, add further support to its importance in facilitating timely discharge and suggests adoption of a Physician-led MDT approach would be advisable for general critical care units. We see this as one of many tools in facilitating flow across critical care units and the wider hospital.

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P15 THE IMPACT OF COVID-19 ON RESPONSE TIMES FOR ACUTE NON-INVASIVE VENTILATION SET-UPS

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Introduction Acute non-invasive ventilation (NIV) is a life-saving treatment and early therapy improves physiological outcomes, reduces intubation rates and shortens length of stay in hypercapnic exacerbations of chronic obstructive pulmonary disease (COPD). A new 2018 BTS quality standard indicates that patients meeting evidence-based criteria should be started on NIV treatment within 60 mins of their decision-making arterial blood gas (ABG). The National Improvement Objective is >60% of patients meeting this target. We aimed to audit the local NIV set up times before and after COVID-19 to generate insights for ongoing quality improvement.

Methods Data was extracted from our NIV unit's quality database for two time periods before and after the start of the COVID-19 pandemic, 1st April – 1st September 2019 and 2020, respectively. Continuous variables were compared using a Mann-Whitney U test and categorical variables using Chi-Squared test.

Results Total numbers of patients receiving NIV decreased by 45.8% from 2019 to 2020 (83 vs 45 patients) with a 37.7% drop in number of COPD patients (53 vs 33). The Median (Interquartile range (IQR) time from decisive ABG to NIV set-up was 61 mins (34) in 2019, which increased to 132 mins (113) in 2020 ($P<0.0001$). Notably, the proportion of patients meeting the BTS target decreased from 48.7% to 23.7% ($P<0.0001$). The number of critical care set ups decreased from 9 to 1 ($P=0.0232$). Moreover, the proportion of patients who completed NIV decreased by 68.8% (48 vs 15) ($P=0.0081$), with number of deaths increasing by 50% (4 vs 8) ($P=0.0136$).

Conclusions The reduction in patient numbers receiving NIV for acidotic respiratory failure is likely due to a decrease in acute COPD exacerbations. However, NIV set up times significantly increased, reflecting the stringent COVID-19 infection control measures around aerosol generating procedures. We report a decrease in critical care set ups and an increase in deaths in 2020, highlighting excess deaths in patients receiving NIV subsequently found to be due to COVID-19. Given ongoing infection controls, global restructuring and improvement of patient flow through hospitals may be required as part of future quality improvement for decreasing response times for acute NIV set-ups.

P16 EFFECT OF HUMIDIFIER TEMPERATURE DURING HIGH FLOW NASAL THERAPY ON CONCURRENT AEROSOL DRUG DELIVERY WITH A VIBRATING MESH NEBULISER

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High flow nasal therapy (HFNT) is commonly used to treat patients that require supplemental oxygen and prescribed lung targeted aerosol drug delivery. Humidifier temperature may impact the percentage of drug dose delivered to patients. This study investigates the effects of humidifier temperature, 34°C v 37°C, during HFNT on the performance of a vibrating mesh nebuliser (VMN) (Aerogen Solo, Aerogen, Ireland).

A 2.5ml dose of 2mg/ml of salbutamol was nebulised using a VMN with the Airvo2 HFNT system via the nebuliser adapter (Fisher & Paykel, New Zealand). A capture filter was placed distal to the nasal prongs of an adult nasal cannula (OPT944) and emitted dose characterised at 10, 30 and 60 LPM. Drug dose was determined by quantifying the mass of drug captured on the filters using UV spectrophotometry at 276 nm.

Abstract P16 Table 1 Emitted dose (%) for VMN in combination with the Airvo2 at 34°C and 37°C

Emitted Dose (%) (Average $\pm$ SD)			
Flow rate	Temperature 34°C	Temperature 37°C	P-Value
10LPM	33.79 $\pm$ 1.72%	33.34 $\pm$ 2.42%	0.810
30LPM	30.25 $\pm$ 2.98%	28.50 $\pm$ 0.70%	0.430
60LPM	19.17 $\pm$ 1.15%	18.88 $\pm$ 0.52%	0.732

Results of this work indicate that the humidifier temperature setting has no significant effect on the emitted aerosol drug dose across flow rates. Consequently, the clinician has the option to adjust temperature without concerns around altered aerosol dosing.

P17 CHARACTERISTICS AND OUTCOMES OF PATIENTS WITH SPINAL CORD INJURY REQUIRING MECHANICAL VENTILATION AT A SPECIALIST VENTILATION CENTRE, 2010–2019

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Introduction Patients with spinal cord injury (SCI) often require complex ventilatory management but limited data exist on this cohort of patients. We sought to characterise the cohort of SCI patients who have received mechanical ventilation at our tertiary ventilation centre.

Methods A retrospective database evaluation of all patients referred to our centre between 2010 and 2019 with SCI and respiratory failure.

Results 205 adults (65% male) were evaluated. Median(IQR) age at time of injury was 43(24–66) years. 84% suffered a high cord injury (C1–C5) and 16% suffered a lower cord injury (C6 and below). Patients suffered from ASIA Grade A (70%), Grade B (16%), Grade C (10%) and Grade D (4%) injuries. 8% patients were successfully weaned from all mechanical ventilation prior to discharge. 87% of patients were established on long-term home mechanical ventilation: 50% with IMV, 37% with NIV. 4% of patients died prior to hospital discharge. 74% of patients were discharged with mechanical insufflation-exsufflation therapy. Regarding discharge destination, 67% were discharged to their home however, due to high multi-disciplinary care needs, 7% were discharged to a rehabilitation hospital and 25% were discharged to a nursing home. Time to death following injury was 5(2–19) years, with age at death of 67(56–73) years. Time to death following injury was 22(3–26) years in the NIV cohort and 7(2–12) years in the IMV cohort. Patients remained under specialist follow-up from our unit for 4(2–7) years.

Conclusion The majority of patients referred with respiratory failure following SCI who survive to discharge are successfully established on long-term ventilatory support. One quarter require care in long-term residential facilities. Three-quarters are provided with mechanical insufflation-exsufflation therapy to aid secretion clearance. Median survival is considerably longer in SCI patients than other groups requiring long-term mechanical ventilation,¹ indicating a need for long-term management strategies to maximise functional capacity and improve health-related quality of life in this patient population.

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