Results 41 patients with COPD were recruited (PLB n=22, control n=19); mean (SD) age 68 (11) years, mean (SD) FEV_1% predicted 47 (15.80)%. There was no statistically significant difference between groups in the primary outcome measures and in retrospect the RCT was insufficiently powered. Post hoc analysis found effect sizes for primary outcome measures were: CRQ-SR dyspnoea 0.05, mastery 0.48 and ESWT 0.44. For secondary outcome measures unpaired t-test showed a significant (p=0.02) reduction in oxygen desaturation on ESWT in favour of PLB group.

Conclusion This study showed PLB practised over 8 weeks resulted in reduced physiological stress with respect to oxygen desaturation when performing a standardised endurance walk. Additionally it raises questions regarding use of a health related quality of life dyspnoea tool when investigating PLB. To date beneficial effect of PLB on dyspnoea related to exercise has only been shown using the Borg breathlessness score (Nield *et al*, 2007).

NIV: COPD, neuromuscular disease and obesity

P266 LATE VENTILATION IS ASSOCIATED WITH HIGH IN-HOSPITAL MORTALITY IN PATIENTS HOSPITALISED WITH ACUTE EXACERBATIONS OF COPD

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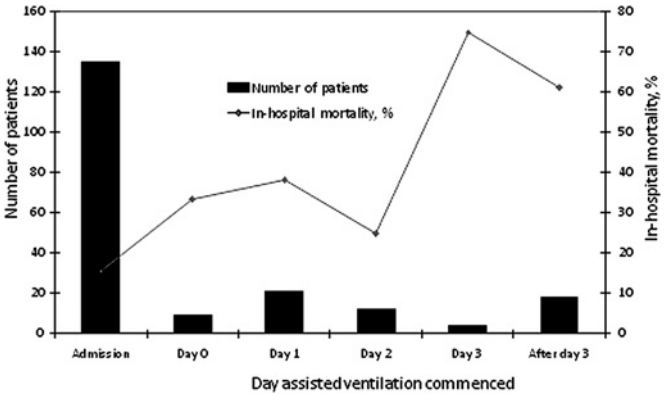
Background Patients with severe acute exacerbations of COPD (AECOPD) often require treatment with non-invasive ventilation (NIV). The BTS audit reported that patients who develop respiratory acidosis and require NIV after 24 h in hospital have a high mortality risk but this relationship has not been investigated prospectively.[1]

Methods Consecutive patients hospitalised with AECOPD and receiving assisted ventilation (NIV or IPPV) were identified. Demographic information, time from admission to commencement of ventilation, arterial blood gases at admission and at time of development of respiratory acidosis (if different), and outcomes of treatment were recorded.

Results 195 of 920 patients admitted with AECOPD were initially treated with NIV and four were ventilated invasively. Mean (SD) age was 73.6 (9.8) years, and most: were female (61.4%); had experienced frequent exacerbations in the previous year (median 3, IQR 1–4); were of normal weight (mean (SD) BMI 25.1 (7.0) kg/m^2); and had severe airflow obstruction (mean (SD) FEV_1 38.1 (16.1) % predicted). 27.6% of patients had received NIV previously for treatment of AECOPD, and 81 (40.7%) patients had coexistent pneumonia on admission.

Median duration of ventilation was 4 days (IQR 1.5–5) and four of the patients who initially received NIV progressed to invasive ventilation. 49 (24.6%) patients died in-hospital. The risk of death increased with longer time from hospital admission to ventilation commencement (Abstract P266 figure 1), with more than 60% of patients who required ventilation after day 2 of their hospital admission not surviving to discharge.

Conclusion Mortality in AECOPD is particularly high in patients who deteriorate and require ventilation after day 2 of the admission. The time from admission to needing ventilation (NIV or IPPV) should inform clinicians considering the prognosis of patients hospitalised with AECOPD.



Abstract P266 Figure 1 Time from admission to commencement of ventilation, and the associated in-hospital mortality.

REFERENCE

1. **Roberts CM,** Stone RA, Buckingham RJ, *et al*. Acidosis, non-invasive ventilation and mortality in hospitalised COPD exacerbations. *Thorax* 2011;**66**:43–8.

P267 ASSOCIATION OF THE LENGTH OF NON-INVASIVE VENTILATION (NIV) WITH ARTERIAL BICARBONATE LEVEL IN COPD PATIENTS WITH ACUTE HYPERCAPNIC RESPIRATORY FAILURE (AHRF)

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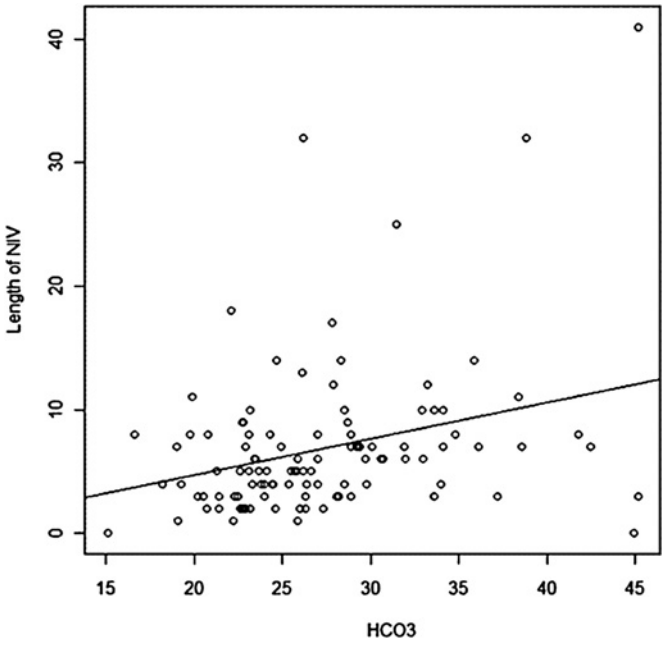
Introduction Following the British Thoracic Society (BTS) NIV audit 2011 we noted that our institution's length of stay was longer than the national average. Factors related to length of stay are complex and related to a lot of non-medical factors, however length (duration) of NIV treatment is not. Although the associations of mortality of COPD patients requiring NIV are well-documented (Non-invasive ventilation (NIV) in chronic obstructive pulmonary disease (COPD) exacerbations with AHRF with pH<7.26. Thomas



Abstract P267 Figure 1 Scatter plot of Length of NIV against HCO_3. p Value for HCO3 is 0.00117, which suggests that HCO_3 is significant and has a positive effect on the length of NIV.

A, *et al. Thorax* 2010;**65**:4. A33), the determinants of the length of NIV have not been clearly elucidated, which we decided to investigate.

Methods A retrospective analysis of the initial ABG values on 67 episodes of NIV for COPD at a dedicated respiratory NIV unit from 1 November 2010 to 30 June 2011 was carried out. Analysis of blood gases and duration of use of NIV was documented and analysed.

Results In an 8-month period, 67 patients were admitted to the NIV unit with AHRF with COPD. There were 6 (8.95%) in-hospital deaths in this group. Mean (range) pH on admission was 7.26 (7.08–7.34), mean (range) pCO_2 was 9.75 kPa (6.03–15.5), mean (range) arterial bicarbonate level (HCO_3) 27.2 mmol/l (19.9–45.2). The mean peak Inspiratory Positive Airway Pressure (IPAP) used was 18.7 cm H_2O and peak Expiratory Positive Airway Pressure (EPAP) was 5.4 cm H_2O. Plotting a graph with HCO_3 and length of NIV we see that it has a linear relationship (see Abstract P267 figure 1). Length of NIV increases by 0.294 days for every 1 mmol/l increase in HCO_3 above the mean.

Discussion This scientific survey indicates that the length of NIV therapy in COPD patients in AHRF increases with a higher HCO_3. Though outcome and mortality is closely linked to the pH, length of NIV is more closely linked to the HCO_3. This is explained by the fact that people with higher HCO_3 are likely to have had chronic respiratory failure for longer and likely to take longer to recover from the respiratory failure.

P268 CAN WE IMPROVE "DOOR-TO-MASK" TIMES FOR PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) REQUIRING NON-INVASIVE VENTILATION (NIV)?

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Introduction COPD is a leading cause of mortality and morbidity and timely use of NIV improves outcomes. National guidelines recommend early intervention in persisting acidosis however, audit data suggests that many patients receive NIV late and have high mortality compared to the results of RCTs. We aimed to improve the process of care for these patients through the introduction of a prospective proforma, prompting clinicians to follow guideline recommendations about timely intervention.

Methods The proforma included items that prompted: care in medications being given, ABGs being taken and decisions regarding escalation of care and resuscitation status being made. All emergency COPD exacerbations managed with NIV were included in the study. Data were collected prospectively for 7.5 months in seven Acute Trusts in London and Essex. Each site was given real time feedback on their performance on a monthly basis.

Results The proforma was used in 138 acidotic COPD patients managed with NIV. Combined data from all the involved sites demonstrated no significant improvement in door-to-mask times during the study period. Overall only 47% of patients received NIV within 3 h of admission and there was significant variation between individual sites in door-to-mask times (p=0.0007, Abstract P268 table 1). Sites were grouped according to their respiratory on call system. Sites with a 9-5 respiratory on call had the shortest door-to-mask time, both during 9:00–17:00 and out of hours, mean time=203.5 min (SD 259), vs 291.9 min (SD 231.9) for 24 h respiratory on call and 327 min (SD 314.7) for those without a respiratory on call. Patients who were started on NIV in locations outside A&E had longer mean door to-mask-times (135.62 vs 377.44 min).

Abstract P268 Table 1 Mean door-to-mask times for individual sites

On call system N=	Site 1 9-5 15	Site 2 No On call 24	Site 3 No On call 21	Site 4 9-5 8	Site 5 24 h 16	Site 6 24 h 33	Site 7 9-5 18
Minimum (time in minutes)	50.0	28.0	5.0	24.0	40.0	7.0	27.0
Median (time in minutes)	150.0	220.5	168.0	102.5	154.5	300.0	90.0
Maximum (time in minutes)	305.0	1440	1091	261.0	362.0	1050	1440
Mean (time in minutes)	157.7	391.9	252.9	133.5	146.3	362.4	272.9
SD	78.58	360.1	240.8	92.63	85.55	248.0	374.1
SE	20.29	73.50	52.54	32.75	21.39	43.17	88.17
Lower 95% CI	114.2	239.9	143.3	56.05	100.7	274.5	86.85
Upper 95% CI	201.2	544.0	362.4	210.9	191.9	450.4	458.9

Conclusion The introduction of a proforma with monthly feedback reports did not improve door-to-mask times. Less than half the patients managed with NIV received this within 3 h. There remains an unacceptable variation in the standard of patient care that may result from different operational practices across hospitals. There is a need to define optimal service delivery to ensure that all patients receive best care regardless of their place of admission.

P269 FEASIBILITY AND ACCEPTABILITY OF NON-INVASIVE VENTILATION (NIV) AS AN AID TO EXERCISE IN PATIENTS ADMITTED WITH ACUTE EXACERBATION OF CHRONIC RESPIRATORY DISEASE

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Introduction Patients with acute exacerbations of chronic respiratory disease are often too breathless to exercise, leading to muscle deconditioning. Using NIV to assist exercise during an exacerbation might prevent this, but it is not known if this is acceptable to patients.

Methods 12 in-patients with an acute exacerbation (including Bronchiectasis and CF) were recruited. If they were unable to cycle for 5 min at 20 Watts unassisted they then cycled with NIV for up to 20 min. NIV settings were adjusted to patient comfort. Patients were asked to rate their level of distress and willingness to repeat the intervention.

Abstract P269 Table 1 Times cycled and change in parameters with exercise

	Without NIV	With NIV	Difference (95% CI)	p Value*
Time cycled (s)	184.42 (65.22)	331.08 (229.09)	146.47 (7.70 to 285.62)	0.04*
Resting SpO_2	94.83 (2.17)	94.83 (2.55)	0.0 (−1.92 to 1.92)	1.00*
Resting HR	94.33 (16.99)	93.83 (18.45)	0.5 (−5.75 to 6.75)	0.86*
Change in SpO_2	−7.33 (5.12)	−3.83 (4.90)	FN	0.029†
Change in HR	16.33 (11.54)	16.33 (7.46)	FN	0.93†
End Borg Dyspnoea	3.72 (1.90)	3.86 (1.87)	FN	0.52‡
End Borg RPE	11.36 (2.29)	11.00 (2.86)	FN	0.93‡

All data presented as mean (SD) or median (range).
*Paired t test.
†Wilcoxon signed rank test.
‡χ^2 test.
FN, failed normality test.