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.

Results Mean age was 50.6 (21.3). 44% male. 53% used NIV at night. All were naïve to NIV during exercise. NIV increased cycle time by 146 s (105%). All stated they would be prepared to repeat this type of exercise (Abstract P269 table 1).

Conclusion NIV is well tolerated, feasible and significantly increases exercise capacity in patients hospitalised with an acute exacerbation of respiratory disease.

P270 MOTOR NEURONE DISEASE (MND); A SURVEY OF DEATHS IN THE ERA OF NON-INVASIVE VENTILATION

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Background The care of patients with MND has changed radically with greater uptake of non-invasive ventilation (NIV) and tube feeding (TF). Community colleagues in our region have expressed anxiety about how such supported patients might die and in particular whether the process of dying might be prolonged. We sought to investigate these concerns.

Methods A structured questionnaire was distributed to involved clinicians, community practitioners and MNDA care co-ordinators. They completed questionnaires for patients dying under their care, where necessary/appropriate with the input of family members. The data are compared with an historical, retrospective series (n=50) reported by the Wisdom Hospice (WH).[1]

Results From October 2010 to June 2011, 51 deaths were recorded (mean age 67 years, 29 men). Thirty deaths were in an acute hospital, 15 at home, six in a hospice or community hospital. 16 patients had advance care plans (ACP) of whom 10 died in their "preferred place". Assisted ventilation had been prescribed to 30 and tube feeding to 37 patients. NIV and TF were discontinued before death in 13 and five patients respectively. For 22 patients the process of dying was sudden or <24 h in duration. NIV was not associated with a prolonged process of dying. The commonest certified cause of death was an unqualified "MND", with pneumonia reported in seven cases. No patient had a post mortem examination. The WH cohort had a similar proportion of men and the mean age at death was 66 years. None of the patients had assisted ventilation and only seven had tube feeding. The process of dying was 24 h or less for 24 patients. The commonest recorded cause of death was respiratory failure (22 individuals).

Conclusion These preliminary results show that there is no trend to prolonged deaths in patients with MND using NIV and TF. Several patients have elected to discontinue NIV. ACP's in our region remain patchy and require further attention. The quality of death certification is poor with little detail on the mechanism of death.

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P271 IMPACT OF STRUCTURED REFERRAL AND FOLLOW-UP PATHWAYS ON ACCESS TO VENTILATORY SUPPORT FOR PEOPLE WITH MOTOR NEURONE DISEASE (MND)

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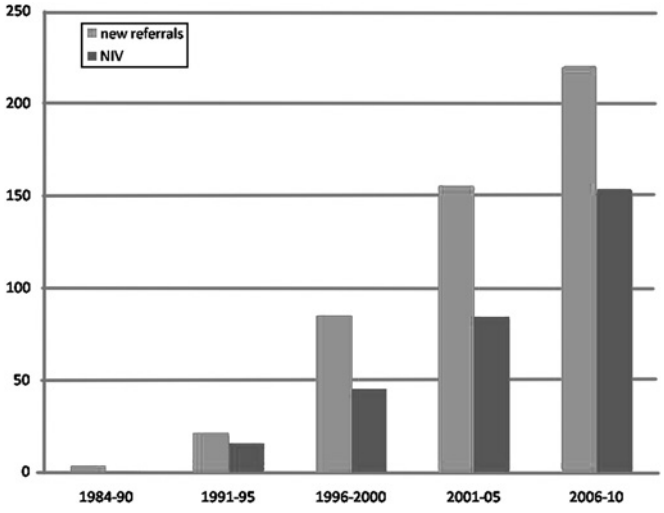
Introduction Attitudes to surveillance for and treatment of ventilatory failure among people with MND have changed over several years. In the UK this culminated in the publication in July 2010 of National Institute of Clinical Excellence (NICE) guidance designed to increase access to non-invasive ventilation (NIV). The services offered in our respiratory unit have evolved on the basis of published evidence in advance of formal guidelines. We examined the impact of compliance with practice parameter recommendations in NICE to our referral numbers and uptake of NIV in East Anglia.

Methods A retrospective review of number of referrals and new NIV starters from 1984 to 2010 in a regional respiratory support unit. Between 2001 and 2005 the MND Association helped to establish a care centre in Cambridge and closer working was established with the respiratory service. From 2006 the default position was to offer all patients newly diagnosed with MND a respiratory assessment and structured 3 monthly follow-up appointments in a fashion subsequently detailed in the NICE guidance.

Results The numbers of new referrals and people starting NIV are shown in Abstract P271 figure 1. Between 1984 and 2000 there was slow growth but the mean annual values were just seven referrals and four new NIV starters (57%). With closer working between neurologists in the care centre and the respiratory unit between 2001 and 2005 mean referral numbers increased to 31 with 17 new NIV starters (55%) per year. With default referral and 3 monthly reviews the number referred grew to 44 with around 31 NIV starters per year (70%).



Abstract P271 Figure 1

Conclusion With an estimated population of 2.5 million in East Anglia, and an annual incidence of 2.8 per 100 000 we estimate 70 new cases of MND per year. Around 60% of patients are therefore being referred and 70% of these are starting NIV. Implementing the NICE guidance could have a similar impact across the UK, a great improvement on the position in 2000 when only around 3% of patients were being offered NIV.[1]

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P272 A 7 YEAR RETROSPECTIVE EVALUATION OF INITIATION OF LONG TERM NON-INVASIVE VENTILATORY SUPPORT FOR MOTOR NEURONE DISEASE

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In 2010 NICE (1) published it's guideline for the use of non-invasive ventilation in the management of motor neurone disease (MND). We have offered long-term non-invasive ventilation (NIV) in this