Methods: Retrospective study of inpatient records with principal diagnosis of asthma, age ≥18 years, in acute care hospitals of the national healthcare system (N=85) in mainland Portugal, with discharges between 2000 and 2010 (N=17 446). Analysis of all episodes that included IV and NPPV that were identified using ICD-9-CM (codes 93.9x and 96.7x). The Charlson/Deyo index, a comorbidity risk adjustment measurement, was used.
Results: In 1 041 episodes (6%) ventilatory support was needed: NPPV 2.3% and IV 3.6%. NPPV use increased from 17 to 79 cases, mainly after 2007, while IV use decreased over the years. Length of stay (days) was similar in both ventilation procedures. Mortality for IV was significantly higher than for NPPV (15% vs. 2.2%).

Characteristics of adults hospitalized with asthma who needed NPPV or IV

	NPPV (N=407)	IV (N=634
Gender: Male/Female	115 (28.3%)/292 (71.7%)	284 (44.8%)/350 (55.2%)
Age: Median (P25–75)	64.9 (57.0–75.0)	52.2 (37.0–69.0)
Comorbidities: Charlson/Deyo index	0.93	0.49
No comorbidities	169 (41.5%)	427 (67.4%)
Length of stay (days): Median (P25–P75)	9.0 (6.0–13.0)	8.0 (4.0–16.0)
In-hospital mortality (N=104, 10%)	9 (2.2%)	95 (15%)

Conclusion: NPPV is increasingly used in severe asthma exacerbations. Patients treated with NPPV have a lower mortality rate despite of being older and having an increased comorbidity risk index. Prospective studies are strongly needed.

241. Noninvasive ventilation for weaning and acute exacerbation management of airway obstruction

P2022
Invasive and noninvasive ventilation in adults hospitalized with asthma in Portugal – Nationwide data from 2000-2010
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Introduction: Few studies have addressed the use and outcomes of invasive (IV) and noninvasive positive pressure ventilation (NPPV) in severe asthma exacerbations.
Objective: To describe the use of IV and NPPV in patients hospitalized due to asthma in Portugal from 2000 to 2010.

P2023
Non invasive proportional assist ventilation in management of severe asthma exacerbation
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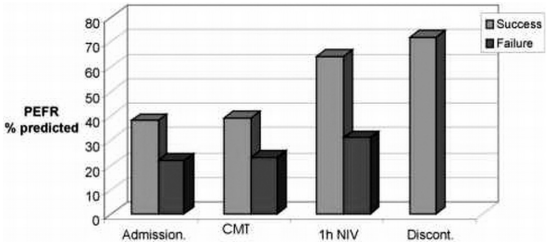
Background: NIV could be beneficial in selected patients with severe asthma exacerbation (SAE). However, its role is still not well defined.
Objective: To evaluate the efficacy of NIV using proportional assist ventilation (PAV) in SAE after failure of conventional medical treatment (CMT).
Patients&Methods: Thirty patients with SAE were failed to respond on CMT. NIV was applied via face mask as a last resort before intubation.
Results: The mean age was 39.2±9.7 with female predominance (19 females Vs 11 males). The successful outcome was achieved in 23/30 patients (76.6%). Follow up of respiratory distress and gasometric parameters after 1 hour NIV in successful group was shown in table 1.

Table 1. Follow up of respiratory distress and gasometric parameters after 1h NIV

Parameter	Conventional therapy	1h NIV	P value
Heart rate	125.3±9.3	107.4±5.3	<0.001
Respiratory rate	38.2±3.3	25.4±2.7	<0.001
pH	7.28±0.03	7.36±0.04	<0.001
PaCO2	55.3±5.3 mmHg	42.5±2.1 mmHg	<0.001
PaO2	58±4.8 mmHg	87±5.9 mmHg	<0.001
PEFR % predicted	39±7.4	64±6.1	<0.001

PEFR in successful and failure groups are shown in figure 1.



After 1h NIV, there were significantly (P<0.01) higher tidal volume, peak inspiratory pressure and triggered breaths % in successful group Vs failure group.
Conclusion: NIV can relieve respiratory distress and improve gas exchange in majority of patients with severe asthma exacerbation who are candidate for intubation after failure of CMT.

P2024
Mixed acid-base disorders, hydroelectrolyte imbalance and lactate production in hypercapnic respiratory failure: The role of noninvasive ventilation
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Hypercapnic COPD exacerbation in patients with comorbidities is complicated by

mixed acid-base, hydro-electrolyte and lactate disorders. Aim of this study was to determine the relationships of these disorders with the requirement for and duration of noninvasive ventilation (NIV).
Methods: Sixty-seven consecutive patients who were hospitalized for hypercapnic COPD exacerbation had their clinical condition, respiratory function, blood chemistry, arterial blood gases, blood lactate and volemic state assessed. Heart and respiratory rates, pH, PaO_2 and $PaCO_2$ and blood lactate were checked at the 1st, 2nd, 6th and 24th hours after starting NIV.
Results: Nine patients were transferred to the intensive care unit. NIV was performed in 11/17 (64.7%) mixed respiratory acidosis–metabolic alkalosis, 10/36 (27.8%) respiratory acidosis and 3/5 (60%) mixed respiratory-metabolic acidosis patients (p=0.026), with durations of 45.1±9.8, 36.2±8.9 and 53.3±4.1 hours, respectively (p=0.016). The duration of ventilation was associated with higher blood lactate (p<0.001), lower pH (p=0.016), lower serum sodium (p=0.014) and lower chloride (p=0.038). Hyponatremia without hypervolemic hypochloremia occurred in 11 respiratory acidosis patients. Hypovolemic hyponatremia with hypochloremia and hypokalemia occurred in 10 mixed respiratory acidosis–metabolic alkalosis patients, and euvolemic hypochloremia occurred in the other 7 patients with this mixed acid-base disorder.
Conclusions: Mixed acid-base and lactate disorders during hypercapnic COPD exacerbations predict the need for and longer duration of NIV.

P2025
Noninvasive ventilation (NIV) for acute hypercapnic respiratory failure (AHRF): Is the helmet an effective interface? A pilot RCT
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To date the helmet is rarely used in AHRF, despite in hypoxic respiratory failure, it is employed as a "rotating" strategy when the facial mask is poorly tolerated.
In a multicenter RCT, we compared the clinical efficacy of a new helmet designed to specifically improve the performance in COPD vs a full face mask during an episode of AHRF.
17 COPDs with AHRF were randomly assigned to receive NIV either with full face mask (Group A, n=9, pH = 7,26±0.07, $PaCO_2$ = 73.7±10.8mmHg, PaO_2/FiO_2 = 97.3±53.7) or the helmet (Group B, n=8, pH = 7.24±0.05, $PaCO_2$ = 83.3±14.2mmHg, PaO_2/FiO_2 = 100.6±41). In the former group the ventilator settings were decided according to the usual practice (i.e. the maximal inspiratory pressure tolerated and CPAP = 4cmH20), while in latter group according to published data (Crit Care Med 2009; 37:1921).
ABGs were evaluated at admission,1 and 6 hour and then everyday until discharge. Vital parameters, discomfort scale, dyspnea score and adverse events were recorded.
Baseline characteristics did not differ significantly between the two groups. 2 and 1 patients for groupA and B respectively required intubation. NIV improved gas exchange vs baseline (p<0.05) both with mask and helmet (pHA = 7,34±0.08, PaCO2A = 59.7±12.3mmHg, and pHB = 7,30±0.06, PaCO2B = 70.4±13.8mmHg, at 1h; and pHA = 7,39±0.07, PaCO2A = 55.2±11.2mmHg, pHB = 7,39±0.04, PaCO2B = 58.0±6.0mmHg, at 6 h). No differences in vital signs, patients' comfort and dyspnea score were observed between the two groups.
In conclusion in this pilot RCT we have shown that the helmet may be a valid alternative to the "classical" full face mask during an episode of AHRF, making the former interface possible alternative for "rotating" strategy.

P2026
Effects of non invasive ventilation on left and right hemodynamic parameters during acute respiratory failure secondary to COPD exacerbation
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Non Invasive Ventilation (NIV) is a technique used in different forms of acute respiratory failure that allows the patient to provide a full or partial ventilatory support without intubation. NIV has obvious effects on lung mechanics, but the changes that brings to the pulmonary vascular circulation, and to the right and left ventricle are more less investigated. Based on this assumption, we studied 32 patients (18 men, 14 women, mean age 72.0±7.5 years) with respiratory failure secondary to COPD exacerbation who required NIV and we submitted to transthoracic echocardiography at the admission and at the resolution of respiratory failure. We have therefore shown that NIV not only has positive outcomes on right ventricular function (reduction of Pulmonary Insufficiency, Tricuspid Regurgitation, and four-chambers Right Ventricolar Systolic and Diastolic Areas and short-axis Diameters with secondary improving of Tricuspid Annular Plane Systolic Excursion), but had a statistical positive effect also on left ventricular function (Ejection Fraction increase, p < 0,05). Minimizing the effect of ventricular interdependence and deflating the lung, NIV not only has positive results on right hemodynamic parameters but, increasing venous return to the left ventricle and recovering the stroke volume, also improves its performance.

P2027
Factors predicting outcome of non-invasive ventilation (NIV) for acidotic hypercapnic respiratory failure (AHRF) from lung diseases other than COPD
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Background: NIV is the treatment of choice for AHRF in acute exacerbation of COPD, neuromuscular and thoracic cage disorders, but its indications have widened in UK hospitals, particularly in patients with AHRF of any cause whose comorbidities preclude invasive ventilation - we sought to establish the predictors of outcome in non-COPD Lung and Airway patients with AHRF.
Methods: Cohort analysis of prospectively collected data on acute NIV for non-COPD Lung and Airway diseases with AHRF in a ward-based NIV unit over 5 years recording diagnoses, demographics, response to NIV at 4 hours and in-hospital deaths (univariate analyses as total numbers too low for logistic regression).
Results: NIV was used to treat 39 episodes of pneumonia, 25 of exacerbations of non-cystic fibrosis (CF) bronchiectasis, 15 of asthma and 3 of CF (in 38, 22, 11 and 3 individuals respectively); comprising 5.67% of all acute NIV episodes. All subgroups among non-COPD Lung and Airway patients receiving NIV for AHRF had impaired lung function with mean FEV1 of 34%, 41%, 43% and 18% respectively; 2 from the pneumonia group were intubated and 12 died during the admission - significantly more than the other subgroups (p=0.049); initial pH significantly predicted death in non-CF bronchiectasis (p=0.007).
Conclusions: In conditions other than COPD exacerbations, neuromuscular and thoracic cage disorders, acute NIV is used little in our unit (5.67%); when used, the predictors of death are broadly similar to COPD in non-CF bronchiectasis, but less predictable in the other groups, pneumonias being associated with higher co-morbidity and in-hospital mortality.

P2028
Long-term survival of COPD patients after first hospital admission with respiratory insufficiency and treatment with non-invasive ventilation in a respiratory ward in Denmark
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Introduction: Implementation of non-invasive ventilation (NIV) as an add-on treatment has been used routinely since 2004 at a University Hospital in Denmark, and data on COPD patients admitted to hospitals in Denmark have been monitored the last three years (National Indicator Project on COPD) show 30-day mortality rates of 10%. No data on long-term survival on COPD patients in Denmark have reported.
Method: Data from medical journals were retrieved from all patients admitted with respiratory insufficiency (respiratory acidosis and hypercapnea) and known or suspected COPD in exacerbation receiving non-invasive ventilation from January 1st 2005 until December 31st 2007. Demographic data collected included age and gender when receiving treatment with NIV for the first time.
Results: In total 257 patients (147 female/110 male) received NIV for the first time. The median age was in all 72 [25-percentile: 65.2 years and 75-percentile: 79.2 years]. The 30-day mortality rate was 29.3%. Survival grouped by gender is illustrated in Fig. 1. There was no statistical significant difference between the groups. The total observation time was between 5 and 7 years.

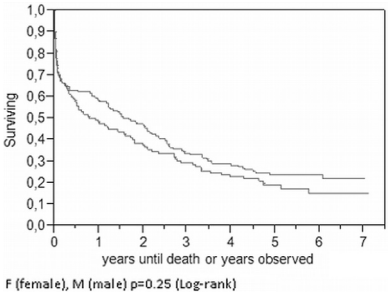

Figure 1. Survival plot for all patients admitted to a respiratory ward (2005-2207) with respiratory acidosis and hypercapnea receiving NIV for the first time.

Conclusion: The mortality rate of patients receiving NIV is as expected high, but the 5 years survival rate was 23.7% and with a trend of more female than male long-term survivors.

P2029
Secondary gain from illness leading to prolonged weaning failure
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Objective: For some patients prolonged weaning from invasive ventilation comes

along with a temporary transfer to home mechanical ventilation. This is associated with a high logistic support, infrastructure of staff and costs for health insurance. Here, patients' physical abilities for weaning needed to be monitored closely to avoid mismanagement of patients.
Methods: Tracheotomised COPD-patients on home mechanical ventilation were analysed during readmission for a follow-up visit and possible decannulation.
Results: Three COPD-patients were identified. All patients showed clear evidence to perform weaning from invasive positive pressure ventilation. However, one homeless patient (50years/male) refused to be weaned due to anxiety loosing his new established home environment. A second patient (64years/male) refused to be weaned based on fear loosing the financial support given from the health insurance to patient's family for nursing. A third patient (65years/female) was successfully weaned to noninvasive ventilation, but called for re-tracheostomy due to fear loosing infrastructure of staff at home.
Conclusion: Prolonged weaning and establishment of invasive home mechanical ventilation can lead to secondary gain from illness. Following, the goal of self-determined living can be contrary to prospective medical therapy.

P2030
Who benefits most from non-invasive ventilation for hypercapnic exacerbations of chronic obstructive pulmonary disease
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Introduction: Non-invasive ventilation (NIV) has revolutionised the management of hypercapnic exacerbations of chronic obstructive pulmonary disease (COPD). We wished to evaluate factors related to its overall success in the "real-life" setting.
Methods: A retrospective analysis of patients receiving NIV for a hypercapnic exacerbation of COPD was performed. Demographics, laboratory data, blood gases and outcomes (hospital discharge or in-patient death) were extracted and subsequently analysed to identify factors relating to its overall success or failure.
Results: Over 6 years, 240 patients (mean age 70 years), received NIV with mean pH and pCO2 prior to NIV 7.24 and 10.4kPa respectively; of these, 167 survived to hospital discharge with a median age (70 vs. 74; p=0.02) lower than non-survivors. Absolute values of pH and pCO2 (higher and lower respectively) prior to NIV and at 1 hour were both associated with successful hospital discharge. An improvement (p=0.02) in pH within an hour of receiving NIV - but not pCO2 - was associated with surviving to hospital discharge. Of all laboratory data assessed, only baseline urea was significantly (p=0.021) associated with a successful outcome.
Conclusion: Younger patients with a lower urea, higher pH and lower pCO2 at baseline and who demonstrate an improvement in pH within 1 hour, are more likely to have a successful outcome when given NIV for a hypercapnic exacerbation of COPD on an unselected basis.

P2031
Efficacy of non invasive mechanical ventilation (NIV) for acute respiratory failure (ARF) in COPD patients with and without pneumonia
Giovanni Alessandrini, Caterina Antonaglia, Alessia Steffanina, Paolo Marinelli, Matteo Bonini, Michela Mordenti, Mattia Internullo, Tullia Villani, Stefano Schiavetto, Elena Angelici, Paolo Palange. *Department of Public Health and Infectious Diseases, Lung Function Unit, "Sapienza" University, Rome, Italy*

Background: NIV represents one of the major technical advances in the management of ARF. Several data in literature showed the efficacy of NIV in COPD hypercapnic patients and in immunodepressed pneumonia patients. By contrast, the role of NIV in the treatment of pneumonia in COPD patients is controversial. We compared the efficacy of NIV for treating ARF in a group of immunocompetent COPD patients with and without pneumonia (ARF-P and ARF-NP).
Methods: Among patients referred to our ward, we studied 12 COPD patients with ARF-P (66.3±14.6SD years) and 9 with ARF-NP (74.5±4.6 years). Diagnosis of COPD and pneumonia were made according to International Guidelines. All patients were treated with a standard NIV pressure-support protocol. The following parameters were chosen as endpoints and recorded at baseline (B) and at 48 hours of NIV treatment: arterial PO2, PCO2, pH, and respiratory rate (RR). Data were analyzed using SPSS 17 statistical software.
Results: No differences in respiratory variables between the two groups were observed at B (p=ns). At 48 hours of NIV treatment, ARF-P patients showed a significant improvement in PO2 (69.3±10.9 vs 56.9±6.9; p=0.003), a significant reduction in PCO2 (51.0±9.4 vs 62.7±11.4; p=0.0008) and RR (18.6±2.1 vs 27.6±3.7; p=00.1). No differences were observed in pH value (7.4±0.1 vs 7.4±0.1; p=ns). Similar results were observed in the ARF-NP group. Time to hospital discharge was not significantly different between groups.
Conclusions: In COPD patients, NIV treatment for ARF is effective independently of the presence of pneumonia. Results should be confirmed on a larger population.

P2032
Nasal non-invasive positive pressure ventilation for moderate exacerbation of chronic obstructive pulmonary disease (COPD) treated in a Tunisian medical ward
Ibtihel Khouaja, Habib Ghedira. *Pavillon 1, Abderrahmane Mami Hospital, Ariana, Tunisia*

Nasal Non-Invasive Positive Pressure Ventilation (NNPPV) is a soft method with a low burden which can be used in medical ward and may improve the outcome of COPD exacerbation.
Aim: The aim of this study is to evaluate the effectiveness of the addition of NNPPV to usual medical care in improving the outcome of patients treated in a medical ward for an exacerbation of COPD with moderate hypercapnia.
Methods: Among 25 patients who were hospitalized for an exacerbation of COPD with moderate hypercpnia, 10 were randomly selected to receive NNPPV (NNPPV group) and then compared to the 15 patients who received only an optimal medical treatment without ventilation support (control group).
Results: The age of patients who received NNPPV did not differ from that of control group (63±10 yrs-old vs 66±9 yrs-old; p = 0,31) and neither did the blood gas on admission (PaO2: 46±9 vs 49±12 mmHg; p=0,56; PaCO2: 58±12 mmHg vs 57±9 mmHg; p=0,80; pH: 7,39±0.1vs 7,38±0.06, p = 0, 8). None of the patients treated with NNPPV died or was transferred to ICU while 2 died and 3 were transferred to ICU among patients of control group. Also, time to improve for blood gas parameters was shorter and on day one we recorded a ΔPaO2 = 33.6±14 mmHg in NNPPV group vs 17.28±19 mmHg in control group (p=0,02) and a ΔPaCO2 =-4±13 mmHg in NNPPV group vs 16±7.5 mmHg in control group (p=0,04).
Results: NNPPV in COPD patients treated for an exacerbation with moderate hypercapnia shortens time to improve of blood gas and is likely to reduce mortality and the need of more invasive ventilation methods.

P2033
Noninvasive ventilation as an end-of-life measure in patients with chronic obstructive pulmonary disease
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Background: Noninvasive ventilation (NIV) has been deemed as a useful measure for reducing the probability of invasive mechanical ventilation in patients with acute exacerbation of chronic obstructive pulmonary disorders (COPD). However, The role of NIV as a palliative measure in dying patients with COPD remains unclear.
Aim: To investigate the usefulness of NIV an an end-of-life measure in patients with COPD.
Patients and methods: We retrospectively reviewed the medical records of COPD patients who died of respiratory failure and had been receiving NIV at the end of life in a university-affiliated medical center.
Results: In 683 COPD patients who died, only 47 (7%) was under NIV support as a palliative measure before death. Most patients (70%) died in general ward, and while the minority of patients had a preexisting "do-not-intubate" (DNI) will, 76% placed a DNI documentation after initiation of NIV. There was no significant increase of respiratory rate or worsening of other vital signs 24 hours after starting NIV, suggesting the usefulness of NIV to prevent progression of distress. The consciousness significantly deteriorated (p=0.001) after the starting of NIV, which prevented the use of opioids or sedative agents. The mean length of NIV was 8.7±7.3 days and most of the patients (79%) were maintaining the NIV until they died, suggesting the tolerability.
Conclusions: Our study results suggest that NIV might be useful for dying COPD patients, who might experience a comfortable dying process. For relieving distress caused by respiratory failure, NIV may be a useful alternative measure to alleviate the dyspnea or discomfort. Further prospective study might be required.

P2034
Acetazolamide for reversing metabolic alkalosis during NIV treatment for AECOPD
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Background: COPD is a leading cause of morbidity and mortality. Hypercapnic respiratory failure during acute exacerbation of COPD (AECOPD) strongly influences the prognosis. Non invasive ventilation (NIV) is an effective treatment for AECOPD. NIV may be less successful in the presence of metabolic alkalosis (MAlk), due to the associated reduced ventilator drive. This study aims to assess the effect of acetazolamide (ACET) on the correction of MAlk, as well as of hypercapnia, during NIV for AECOPD.
Methods: Among patients referred to our clinical ward and treated with NIV, seven subjects (78.7±7.8 years) with AECOPD, hypercapnic (PaCO2 ≥45mmHg) respiratory failure (PaO2 ≥60mmHg), and MAlk (pH ≥ 7.40 and HCO3- ≥30mmol/L)

were enrolled in the study. Twenty-four hours (Day 0) from starting NIV treatment, ACET 500mg p.o. daily for two consecutive days (Day 1 and 2) was administered. The following parameters were measured: arterial PO2, PCO2, pH, HCO3-, chloride and urinary pH. Results are expressed as mean±SD. Student t-test with Bonferroni's correction was used for statistical analysis.
Results: Both at Day 1 and 2, pH and PaCO2 were significantly reduced compared to Day0: pH 7.42±0.04 vs 7.45±0.04, p= 0.02; PaCO2 58±4mmHg vs 68±10, p= 0.03. HCO3- decreased with ACET, being the reduction more pronounced at Day2 compared to Day 0 (36.2±4.8mmol/L vs 45.9±6.2, p= 0.0006). Conversely, urinary pH significantly increased during ACET. No drug adverse events were observed.
Conclusions: ACET may be useful for the correction of MAlk during AECOPD that requires NIV. A reduction in both pH and PaCO2 can be obtained in the first 24-48 hours of treatment. Further studies are needed on its long term efficacy.

P2035
Arterial bicarbonate as a determinant of the length of non-invasive ventilation (NIV) in COPD patients with acute hypercapnic respiratory failure (AHRF)
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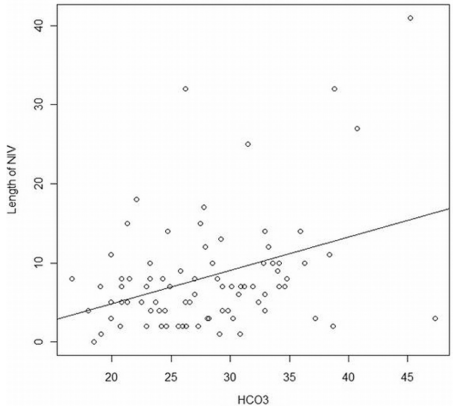
[1]Department of Respiratory Medicine & Physiology, Heart of England NHS Foundation Trust, Birmingham, United Kingdom; [2]School of Mathematics, University of Birmingham, United Kingdom

Introduction: Factors related to length of stay are complex and related to many non-medical factors, however length (duration) of NIV treatment is not. Although the associations of mortality of patients requiring NIV are well-documented (Thomas 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 arterial blood gas bicarbonate (HCO_3mmol/L)values on 115 consecutive episodes of NIV for at a dedicated respiratory NIV unit from 01 Jan to 31 Oct 2011 was carried out. Analysis of blood gases and duration of use of NIV (in days) was documented and analyzed.
Results: There were 115 patients admitted with AHRF with COPD. Plotting a graph with HCO_3 and length of NIV we see that it has a linear relationship.



The p-value for HCO_3 as a determinant of length of NIV is 0.00084, which suggests that it is significant.
Conclusion: This scientific survey indicates that the length of NIV therapy in 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 are likely to take longer to recover from the respiratory failure.

P2036
Acidotic hypercapnia: Beyond type 1 and type 2 respiratory failure
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Introduction: The indications of non-invasive ventilation (NIV) have widened in the recent years, which is now used in treating hypercapnia with acidosis in a variety of patients. However, in many of the patients treated with NIV, the acidosis may have preceded the hypercapnia. The current case series from our 11-bedded ward based NIV unit describes such acidotic hypercapnia: hypercapnic respiratory failure following metabolic acidosis.
Methods: Time series of Arterial Blood Gas (ABG) findings in 4 patients with acidotic hypercapnia with a background of COPD confirmed with spirometry.
Results: The ABGs for cases 1 and 2 showed a rising CO_2 following the onset of a metabolic acidosis; a mixed metabolic and respiratory acidosis in patients 3 & 4 - with the acidosis preceding hypercapnia (Case 3) or being out of proportion to CO_2 rise (Case 4). All four patients improved with initiation of NIV combined with active fluid/electrolyte management. A sample ABG time series (Case 3) showing initial eucapnia with acidosis leading to hypercapnia is shown:

Acidosis preceding hypercapnia on ABG Time series

	Time			
	Day 1: FIO2=0.28	Day 2: FIO2=0.24	Day 2: 1 hour post NIV	Day 2: 4 hours post NIV
pH	7.336	7.143	7.367	7.462
pO2	11.2	8.76	6.55	7.91
pCO2	5.56	11.8	7.51	5.7
Bicarbonate	21.6	N/A	29.4	29.8
Base Excess	-3.2	-4.0	+3.0	+6.2

The classic Acidotic Hypercapnia picture.

Discussion: Acidotic hypercapnia could be a further subtype of respiratory failure (akin to previously described Type 4 or shock-muscle hypoperfusion related respiratory failure) for which larger confirmatory studies and prospective trials to establish the efficacy and timing of NIV are required.

P2037
A cohort study for improvement of asthma attack by noninvasive positive pressure ventilation (NPPV)
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Objective: A few study of efficacy of NPPV therapy in asthmatic patients have been reported. We studied efficacy and incidence rate of NPPV therapy.
Method: This prospective cohort study was performed in two hospitals in Okayama prefecture, Japan. All of the patients admitted because of asthma attack between January 2005 and June 2010.Patients had to fulfill the following criteria before hospitalization. 1. The patients' peak flow is less than 200L/min or 30% of his or her best peak flow 2. Borg scale is nine or ten. Hospitalization patients had to fulfill the following criteria for NPPV therapy. 1. Patients received $PaCO_2$ >45mmHg and pH<7.351. 2. His or her Borg scale is ten.
Results: 94 patients were included in the study. Fourteen patients were received NPPV therapy.All patients avoided receiving mechanical ventilation.
Figure 1 shows profile of pH in the patients receiving NPPV. Figure 2 shows profile of Borg scale in the patients receiving NPPV.

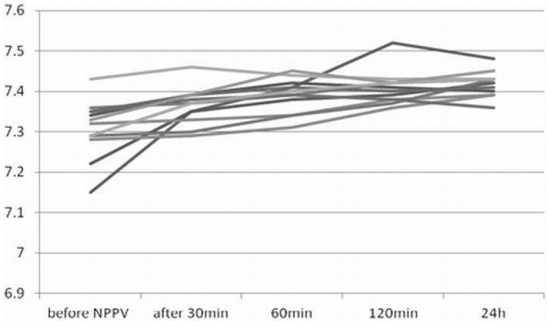

Figure 1. Profile of pH in asthmatic patients received NPPV.

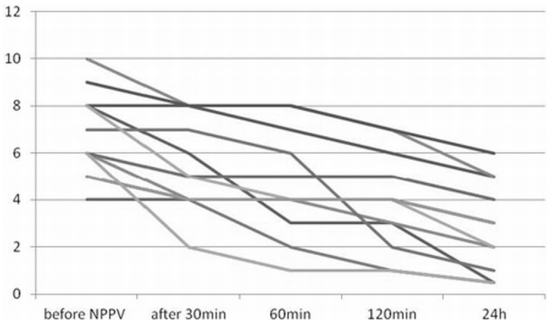

Figure 2. Profile of Borg scale in asthmatic patients received NPPV.

Conclusion: The proportion of patients need NPPV therapy is 15%. In asthmatic patients NPPV therapy appears highly effective in correcting gas exchange abnormalities and severe dyspnea.

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Should teaching about non-invasive ventilation be made mandatory to all grades of general medical doctors? An audit of junior doctor knowledge regarding the management of patients on NIV before and after teaching sessions

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Introduction: Patients on non-invasive ventilation (NIV) are usually looked after out of normal working hours by general medical doctors.
Aims and objectives: We sought to determine the level of knowledge about NIV amongst general medical foundation (F1) doctors, core medical trainees (CMT) and specialist registrars (SpRs) before and after teaching.
Methods: Junior doctors were asked to complete a questionnaire covering knowledge about the criteria for commencing NIV, initial settings and appropriate manipulation of NIV machines according to patient response before and after mandatory teaching for F1 and CMT trainees and a voluntary attendance session for SpRs.
Results: Forty-nine doctors completed the questionnaire pre-teaching and all F1 and CMT doctors attended training but only 5/16 SpRs attended teaching.
Some of the most concerning findings were that all grades were poor at defining type II respiratory failure pre- and post-teaching. Knowledge about initial ventilator settings, alteration of pressure settings and target oxygen saturations on NIV were poor before teaching (although better in SpR group than more junior doctors). Majority would have aimed for pressure settings too low to be effective. However, knowledge improved substantially after teaching amongst those who attended.
Conclusion: Baseline knowledge of all grades of junior doctors about practical NIV care is poor risking ineffective treatment but this can be improved by teaching. However, sessions need to be mandatory to ensure attendance.

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Short and long-term outcomes after the first episode of non-invasive ventilation (NIV) for an acute exacerbation of COPD (AECOPD) on a general ward

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Background: NIV is an evidence based treatment for acute respiratory acidosis due to an AECOPD. However, less data exist on long-term prognosis after the first episode of NIV.
Aim: To investigate the short and long-term outcomes after the first episode of NIV for AECOPD.
Method: A retrospective, observational, cohort study of 183 patients admitted to the hospital between 2008-2011 for an acute respiratory acidosis due to AECOPD treated with NIV on a general ward. Potential prognostic factors were recorded.
Results: During a 3-year period 275 admissions involving 183 patients were analysed. Included were 72 (39%) men and 111 (61%) women, with a mean age of 70 years (range 45-93y) and a mean FEV1 of 33% (range 12-74%). 34 (19%) patients were readmitted for NIV with an average of 3 admissions (range 1-9).
Success rate of NIV was 76% (211 of 275 episodes). In 24% (64 episodes) NIV failed: 32 patients died during NIV (all prior Do-Not-Intubate patients), 7 did not tolerate NIV and died (all prior DNI patients), 16 needed invasive ventilation at the ICU (2 died), 9 died because of a non-respiratory cause.
In-hospital mortality during the first admission was 21%. The mortality rate at 1 and 2 years was 48% and 53%, respectively. The cause of death was COPD in 70%, cardiovascular in 6%, miscellaneous in 24%.
Multivariate logistic regression analysis showed that higher age, persistent hypercapnia and domiciliary oxygen use were associated with bad prognosis. The parameters of severity of the first NIV episode were not prognostic.
Conclusion: Success rate of NIV on a general ward is high (76%), but survival after 1 and 2 years is poor.

P2040

Outcome of respiratory critical care patients treated with noninvasive ventilation as a maximal intervention strategy

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Background: End-of-life decisions are an important part of day-to-day medical practice in Respiratory Intensive Care Units (RICU), reflecting the need to prevent unreasonable therapeutic interventions. Noninvasive ventilation (NIV) can be used in the do-not-intubate patient and in palliative care setting.
Aim: To determine the outcome of patients with respiratory failure (RF) in whom NIV was performed as a maximal intervention strategy.
Methods: Prospective study of 369 patients admitted to our RICU for 18 months. Age, gender, APACHE II, diagnosis,comorbidities, inpatient days, NIV duration, type of respiratory failure, $PaCO_2$ on admission, NIV dependence (quantified in hours/day as follows: <15, 16-23 and 24) and RICU mortality were evaluated. Patients were divided in 2 groups based on outcome (alive/dead) and variables were compared between groups.
Results: Among patients in need of ventilatory assistance (n=242), 60 had a decision to forego tracheal intubation (24,8%). Age (y): 70±16. Males: 60%. APACHE II: 16±8. Inpatient days: 14±12. Diagnosis, %: chronic respiratory disease 50, heart failure 11, cancer 10, pneumonia 10, neuromuscular disorders 7, others 12. Thirty percent had at least two comorbidities (considering chronic heart failure, chronic renal failure, pulmonary hypertension and dementia). ICU mortality: 73%. Mortality, % (hypoxemic RF/hypercapnic RF): 100/64, p=0,007. $PaCO_2$, mmHg (alive/dead): 62±15/51±17, p=0,03. Mortality, % (NIV<15/16-23/24h): 0/22/78, p<0,001.
Discussion: The presence of hypercapnic RF had better prognosis, as opposed to hypoxemic RF. Greater NIV dependence was correlated with higher mortality. The mortality rate observed was high, as expected in this subset of patients.

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Elective early noninvasive ventilation as a weaning method of COPD patients

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Patients with acute exacerbations of COPD represent a large portion of critically ill patients that mechanically ventilated. The rate of weaning failure is high in these patients. Prolonged mechanical ventilation (MV) increases intubation associated complications.
Objective: To determine the efficacy of early non-invasive mechanical ventilation as a weaning method in COPD patients with acute hypercapnic respiratory failure compared with the conventional-weaning approach.
Methods: Study was conducted on a 30 mechanically ventilated COPD patients who had infective exacerbations. Patients were randomly extubated, receiving non-invasive ventilation (n=15), or weaned following a conventional-weaning approach (n=15).
Results: Compared with the convential-weaning group, the noninvasive-ventilation group had shorter periods of invasive MV, total ventilator support, ICU stay, less incidence of ventilator associated pneumonia and less mortality.

Outcome parameters in both studied groups

Character	Noninvasive ventilation Group	Standard Group	P value
Number	15	15	
Duration of invasive MV (days)	6.8±3.1	18.9±6.5	<0.001
Duration of total MV (days)	14.3±8.1	18.9±6.5	<0.001
Duration of ICU stay (days)	14.6±4.2	24.5±12.9	<0.001
Incidence of VAP	1	5	<0.001
Weaning failure	2	4	<0.001
Number of death in the hospital	1	3	<0.001

P value less than 0.001 was considered significant.

Conclusion: Patients with chronic obstructive pulmonary disease who had respiratory failure and were starting to breathe spontaneously, showed that noninvasive ventilation could decrease pneumonia, length of stay in the intensive care and the duration of ventilatory support.
Reference:
[1] Manthous CA. The anarchy of weaning techniques. Chest 2002;121:1738-40.