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**Conclusions:** Patients with CAP and severe ARF can be treated with NIV with a reasonable success rate. Successful NIV treatment is strongly related with improved outcome in these patients. Multi-organ failure and older age strongly predict both treatment failure and poor survival.

**P3781****Pressure support in acute hypercapnic respiratory failure in an acute clinical setting**

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**Introduction:** Non-invasive ventilation (NIV) is now routinely used for treatment of Acute Hypercapnic Respiratory Failure (AHRF). There is much debate as to whether usage of higher pressures for ventilation improves the outcome in an acute setting.

**Aim:** We set out to assess what pressures for NIV were needed to achieve reversal of acidosis in AHRF in an acute clinical setting and what was the outcome.

**Method:** A scientific survey was conducted over 6 years in a teaching hospital ward-based NIV unit. Levels of Inspiratory Positive Airways Pressure (IPAP) and Expiratory Positive Airways Pressure (EPAP) levels needed to achieve reversal of acidosis in AHRF were analysed. Patients with AHRF were divided into 2 groups; AHRF from chronic obstructive airways disease (COPD) and AHRF from non-COPD related illnesses. Mortality during the admission in the 2 groups was also assessed.

**Results:** A total of 1188 episodes with 820 COPD related and 366 non-COPD related AHRF admissions were recorded. In the COPD group pressures (in cm H<sub>2</sub>O) needed for reversal of acidosis were IPAP max 30, min 10 and median 16.7; EPAP max 12, min 4 and median 5.2. In the non-COPD group; IPAP max 30, min 10 and median 16; EPAP max 11, min 4 and median 5; 83/820 (10.1%) of COPD and 50/366 (13.66%) of non-COPD patients died during admission.

**Conclusions:** Our findings suggest that reversal of acidosis AHRF from underlying COPD or other illnesses can be achieved with satisfactory outcomes without the need of high pressure ventilation. Further well designed studies would be needed to explore this further.

**P3782****Home versus intensive care ventilators providing noninvasive ventilation (NIV): A clinical comparison during acute respiratory failure due to COPD exacerbation**

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**Background:** Different bench test studies were performed to compare the performance characteristics of home and ICU ventilators. However little data in comparison are available in a clinical setting.

**Aim:** To compare the clinical effects of NIV delivered by ventilator dedicated to ICU versus devices designed for home care.

**Material and method:** We enrolled 30 patients admitted in semi-intensive care unit to ARF due to AECOPD (Baseline pH 7.24±0.04, PaCO<sub>2</sub> 87.4 mmHg ±16.5 PaO<sub>2</sub> 70.6 mmHg±18.9, aged 79±7 yrs, RR 36±5 [mean±SD]). Patients were randomized in two groups to receive NIV delivered by an ICU ventilator or three home ventilators. Baseline characteristics showed no significant differences in both groups. Several exclusion criteria were included (i.e.coma, obesity, CWD, Pneumonia,etc.).Pressure support mode (range 17 cmH<sub>2</sub>O±3) with Peep (range 5 cmH<sub>2</sub>O ±1) was used. All the devices were equipped with the analysis of flow and pressure curves,with a standard double-tube circuit and the same interface. ABGs were sampled on baseline and after 2 hours.

**Results:** NIV was effective in both groups with significant pH and PaCO<sub>2</sub> improvement after two hours starting (p=0.01). No statistical differences were found in the two groups in terms of percentage of pH improvement (p=0.206) and PaCO<sub>2</sub> decrease (p=0.351). No Causes of NIV failure were found in the first 2 hours.

**Conclusion:** These few data, limited to COPD exacerbation, show that home and ICU ventilators are equally effective in improving blood gas exchange. Further clinical studies could help clinicians in choosing the appropriate devices, tailoring the choice to a given patient.

**P3783****Predictors of mortality in patients treated with non-invasive ventilation for acute hypercapnic respiratory failure due to COPD**

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**Background:** Mortality in patients treated with non-invasive ventilation (NIV) for acute hypercapnic respiratory failure (AHRF) during an acute exacerbation of COPD (AECOPD) is high. For many patients, AHRF is an end-stage process and NIV may be inappropriate. However there is no definitive method of identifying patients who are unlikely to survive.

**Aim:** The aim of study was to identify clinical and laboratory variables predictive of mortality in patients treated with NIV for AHRF due to COPD.

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## 404. Recent advances in noninvasive ventilation used for treating acute respiratory failure

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**P3780****Non-invasive ventilation (NIV) in community-acquired pneumonia (CAP) and severe acute respiratory failure (ARF): Effectiveness and risk factors for failure and mortality**

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**Background:** The use of NIV for treating severe ARF due to CAP is controversial, and the risk factors for failure with this mode of ventilation are not well-known in these patients.

**Methods:** Prospective observational study to assess the usefulness of NIV in patients with CAP and severe ARF. The primary end-point variable was to determine the success of NIV, defined as avoidance of endotracheal intubation and survival in the ICU and for at least 24 hours in the medical ward, in patients with CAP. We assessed predictors of NIV failure and hospital mortality in multivariate analyses.

**Results:** We studied 184 consecutive patients with CAP and severe ARF; 102 (55%) patients had *de novo* ARF and 82 (45%) previous pulmonary or cardiac disease. NIV was successful in 116 (63%) patients. Hospital mortality was 10 (9%) in successfully treated patients and 37 (54%) in those who failed treatment (p<0.001). The variables independently related to NIV failure in the multivariate analysis were SAPS-II at admission, maximum SOFA during NIV, older age, higher heart rate and lower PaO<sub>2</sub>/FiO<sub>2</sub> ratio after 1 hour of NIV, and worsening of radiologic infiltrate 24 hours after admission. Likewise, independent predictors of hospital mortality were maximum SOFA during ICU stay, NIV failure and older age.

**Methods:** Patients treated with NIV for AHRF due to COPD between 12/09 and 07/10 were included in prospective study. Variables included FEV<sub>1</sub>, pre-admission treatment, performance status (WHO-PS), clinical observations & composite physiological score (early warning score EWS), routine haematology & biochemistry, and arterial blood gases prior to commencing NIV.

**Results:** N=65 (29M, 36F); mean (SD) age 71 (10.5) yrs. Mortality was 33.8%. On univariate analysis variables associated with mortality were: WHO-PS  $\geq 3$  OR 37.78 (7.41-192.53)  $p < 0.0001$ ; long-term oxygen therapy OR 2.99 (1.03-8.66)  $p < 0.05$ ; anaemia OR 5.54 (1.81-16.92)  $p < 0.003$ , diastolic blood pressure OR 0.96 (0.92-0.99)  $p < 0.03$ , raised EWS OR 1.45 (1.06-1.99)  $p < 0.03$ , severe acidosis ( $\text{pH} < 7.20$ ) OR 3.65 (1.17-11.37)  $p < 0.03$ . On multivariate analysis only anaemia OR 5.86 (1.28-26.87)  $p < 0.03$  and WHO-PS  $\geq 3$  OR 39.08 (6.83-223.61)  $p < 0.0001$  were significant. The presence of both predicted 68% of deaths with a specificity of 94%.

**Conclusion:** The presence of anaemia and WHO-PS  $\geq 3$  are predictive of mortality in patients on NIV for AECOPD. This should prompt the physician to consider the suitability of NIV as a treatment option.

### P3784

#### Non invasive ventilation (NIV) in conscious sedation with remifentanyl

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**Background:** NIV use in acute hypercapnic respiratory failure (AHRF) patients who refused orotracheal intubation is an open question. Agitation is a frequent reason of NIV failure.

**Aim:** We have evaluated the safety and tolerance of NIV in patients under conscious sedation induced by remifentanyl.

**Methods:** Thirty (11F19M) consecutive COPD patients with AHRF admitted to our Semi-intensive care Unit were unable to tolerate NIV treatment. Patients were submitted to remifentanyl sedation (continuous perfusion 0.1±0.03 µg/kg/min). We assessed the changes in arterial blood gas, tolerability and adverse events at the time of admission, after 30 min and 60 min of NIV use.

**Results:** PaO<sub>2</sub>/FiO<sub>2</sub> ratio improved after 60 min ( $p < 0.0001$ ). PaO<sub>2</sub> increased from 46±7 (pre-NIV) to 61±4 mmHg (post-NIV). PaCO<sub>2</sub> decreased from 67±4 (pre-NIV) to 45±3 mmHg (post-NIV). We documented hypotension in 2 patients (7.6%) treated by dose adjustments. No bradycardia and respiratory depression were observed. We have not documented any unforeseeable event. No patient died during admission.

**Conclusions:** In selected population remifentanyl is well tolerated in AHRF patients treated with NIV.

### P3785

#### Noninvasive ventilation in the weaning of patients with acute-on-chronic respiratory failure due to COPD

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**Background:** Endotracheal intubation (ETI) and mechanical ventilation are often needed in patients with acute-on-chronic respiratory failure (ACRF) due to acute exacerbations of COPD (AECOPD).

**Purpose:** It was to assess the usefulness of non invasive ventilation as an early extubation and weaning technique in ACRF secondary to AECOPD.

**Patients and methods:** Among 384 consecutively intubated patients admitted for ACRF due to AECOPD, a prospective, randomized controlled trial of weaning was conducted in 264 patients who failed a 2-h spontaneous breathing trial, although they met simple criteria for weaning. Conventional invasive pressure support ventilation (IPSV) was used as the control weaning technique in 130 patients (IPSV group), and NIV was applied immediately after extubation in 134 patients (NIV group).

**Results:** No statistical difference was found in the characteristics of the two groups at randomization. In the IPSV group, 100 of 130 patients were successfully weaned and extubated, versus 124 of 134 in the NIV group ( $p < 0.05$ ). NIV like IPSV significantly and similarly improved gas exchange in relation to that achieved during a 2-h spontaneous breathing trial ( $p < 0.05$ ). The duration of ETI was significantly shorter in the NIV (4.52±0.87 d) than in the IPSV group (7.06±1.32 d) ( $p < 0.001$ ). NIV reduced significantly the duration of ETI, weaning failure, nosocomial pneumonia, ICU stay and hospital stay.

**Conclusions:** 1. NIV like IPSV significantly and similarly improves gas exchange during weaning, of patients with ACRF secondary to AECOPD, from invasive MV. 2. NIV reduces significantly the duration of ETI, weaning failure, nosocomial pneumonia, ICU stay and hospital stay.

### P3786

#### Leptin kinetics in patient with obesity hypoventilation syndrome (OHS) during non-invasive ventilation (NIV)

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**Background:** Leptin is pleiotropic hormone which has important physiological

effects in patients with OHS. Currently there is no data about leptin kinetics for the management or follow-up of OHS patients with acute respiratory failure (ARF).

**Objectives:** To evaluate the leptin kinetics in patients with OHS during hypercapnic ARF treated with NIV therapy.

**Methods:** Our prospective observational study included 19 OHS patients hospitalized for ARF (age 55.9±12.2 yrs, BMI 56.7±8.3 kg/m<sup>2</sup>, PaO<sub>2</sub> 42.6±10.35,9 mmHg, PaCO<sub>2</sub> 58.5±12.2 mmHg), all patients received NIV during hospitalization. Serial serum leptin levels, arterial blood gases, pulmonary function and echocardiography tests were measured.

**Results:** Initial leptin concentrations were significantly elevated in OHS patients (38.6±9.7 ng/ml), and after 10-14 days of NIV therapy leptin levels significantly decreased (to 32.1±12.5 ng/ml,  $p < 0.001$ ). But in patients with more slower reduction of PaCO<sub>2</sub> (n=9) leptin levels didn't change significantly at hospital discharge.

Initial leptin concentrations correlated with residual lung volume ( $r = -0.76$ ,  $p = 0.04$ ) and leptin kinetics correlated with change in PaCO<sub>2</sub> ( $r = -0.49$ ,  $p = 0.04$ ) and change in PaO<sub>2</sub> ( $r = 0.75$ ,  $p < 0.0001$ ). Patients with slower leptin kinetics had higher BMI, more severe hypoxemia, hypercapnia, less pH and left ventricular ejection fraction ( $p < 0.05$ ); they needed more intensive NIV and had an increased risk of hospital readmission during 3 months (n=7,  $p < 0.041$ ).

**Conclusions:** Assessment of leptin kinetics in OHS can help to predict outcome of NIV therapy and it may be of value for guiding NIV intensity in these patients.

### P3787

#### A prospective study of low pressure non invasive ventilation (NIV) in management of type 2 respiratory failure with acute exacerbation of COPD with comorbidities

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**Introduction:** NIV has shown to improve the in hospital mortality and morbidity associated with AECOPD with type 2 respiratory failure. BTS recommends in NIV guidelines (2009) to increase the ventilatory pressure as much possible in first hours of initiation of NIV to correct the acid base imbalance. It is recognised that some patients with COPD and comorbidities are intolerant of high pressure and associated air leak with poor compliance with pressure support. In a prospective study we assessed the patient tailored approach with low pressure NIV by Bipap in ward setting in these patients

**Method:** All patients admitted with type 2 respiratory failure with AECOPD with comorbidities who require NIV transferred to ward based NIV unit. Patient condition was assessed by medical specialist and a patient tailored approach with gradual and low pressure ventilation was initiated by trained NIV team.

**Results:** Results are summarised in the table.

|                       |             |               |
|-----------------------|-------------|---------------|
| No. of patients       | 24          | 28 episodes   |
| Mean age              | 66.9        | range 49-90   |
| Male / Female         | 7           | 17            |
| Comorbidities >3      | 11          | 45%           |
| Mean pH               | 7.25        | 7.05-7.41     |
| Mean paO <sub>2</sub> | 12.3        | 3.1-27.7      |
| Mean pco <sub>2</sub> | 10.47       | 6.7-15.3      |
| IPAP                  | 14.32       | 12-22         |
| EPAP                  | 4.607       | 4-8           |
| Duration of NIV       | 3.7 days    | 1-28          |
| Mortality             | 4/24, 16.6% | p value <0.01 |

**Conclusion:** In this small prospective observational study low pressure NIV in patient with AECOPD with comorbidities and type 2 respiratory failure has shown to improve the morbidity and mortality and patient compliance. We recommend that use of low pressure NIV in these cohort of patients is a safe and alternative approach. This should be further assessed in a proper randomised controlled trial with conventional approach as recommended by BTS.

### P3788

#### Mortality in acute patients treated with noninvasive ventilation (NIV)

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**Objective:** To evaluate the mortality of patients with NIV, in a general way and by disease and to determine whether there are differences between the group that survives against the group that passes away.

**Methods:** We evaluated patients in acute respiratory failure and treated with NIV in our hospital from 2008 to 2010. General data, blood gases, pathology and treatment criteria were analyzed and compared.

**Results:** n=598. Overall mortality was 17.8%. The mortality related to respiratory failure was 11.3%. In a subgroup of 170 patients, we analyzed whether the NIV was carried out due to clinical-gasometric criteria, limitation of therapeutic effort (LTE, without intensive care unit admission criteria) or palliative criteria. We find significant differences between groups, showing that more than 1/2 of the deceased (66%) had a palliative criteria. The mortality of LTE was approximately 1 out of 4. Mortality from pathology was (% of the total for each pathology): COPD (11%)

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with or without other pathology (6%) vs (4%), interstitial lung disease (55%), OHS (5.2%), kyphoscoliosis (17%), heart failure (16%) and neuromuscular disease (41%). When comparing epidemiological data, comorbidities, pH, PCO<sub>2</sub> and side effects between the group died and those who survived after treatment, we found significant differences in the deceased group: older, less obese.

**Conclusions:** -It is necessary to perform a detailed analysis of mortality in each group of pathology. In COPD and OHS, which are the most ventilated, it is quite worthwhile to carry out NIV. -The palliative patients group increase mortality rates so it is very important to analyze this group separately. -To carry out NIV may be an alternative for patients who do not fulfil ICU admission criteria.

**P3789****Decision making in acute hypercapnic respiratory failure due to COPD: Criteria in patient selection & determining ceiling of care**

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**Background:** Non-invasive ventilation (NIV) is effective in acute hypercapnic respiratory failure (AHRF) due to COPD but the UK National COPD Audit (2008) raised concerns about patient selection; only 70% of eligible patients received NIV and invasive mechanical ventilation (IMV) was used in only 3% if NIV failed.

**Aims:** The aim of this study was to ascertain criteria clinicians use to make decisions regarding NIV.

**Methods:** A 12 point questionnaire was sent to doctors involved in acute care of patients admitted with acute exacerbation of COPD. Key areas included arterial blood gas (ABG) criteria for NIV, prognostic factors and decisions on ceiling of care. Comparisons were made between grades and specialities.

**Results:** 31 questionnaires were completed. 61.3% consultants, 16.1% specialist registrar (SPR), 24.5% other training grades (OT). Specialities: ITU 16.1%, Respiratory (RESP) 22.6%, Other general medical 61.3%. Most (74.1%) made decisions on NIV at least weekly. There was poor agreement on ABG criteria for NIV ( $Kappa$  0.36). Adherence to guideline criteria for NIV varied by specialty: RESP 85.7% v non-RESP 41.6% OR 8.4 (1.08-59.8). Agreement on prognostic criteria was poor ( $K$  0.17). 80% of SPR and 28.5% OT grades frequently make decisions on ceiling of care.

**Conclusions:** AHRF due to COPD is often managed by non-respiratory physicians. There is marked deviation from guideline criteria for initiation of NIV. There is poor agreement between physicians regarding prognostic criteria used to determine ceiling of care. These decisions are frequently made by junior medical staff.

**P3790****Prognosis after non-invasive ventilation (NIV) for chronic obstructive pulmonary disease (COPD)**

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**Introduction:** Non-invasive ventilation is now standard therapy for acute type 2 respiratory failure secondary to COPD. It reduces mortality, intubation rate and length of stay even when given in a general respiratory ward<sup>1</sup>. Therefore, many patients who would otherwise had not survived, are now successfully discharged.

**Aims and objectives:** To assess survival and readmission rate over subsequent one year in these patients in "real life" while receiving routine medical care in the community.

**Methods:** Retrospective review of 50 randomly selected patients admitted between 12/2001 and 9/2009 to Blackpool Victoria Hospital, a large district general hospital in North West of England.

**Results:** M/F: 37/13, mean age 68.9 years (SD= 10.9). 49/50 patients were current (n=19) or ex (n=30) smokers. 26/49 (53%) were on long term (n=11) or short burst (n=15) oxygen. 3 had been previously admitted to ITU and 9 had received NIV. 6 patients had pneumonia and 17 evidence of cor pulmonale on ECG at the time of admission. 26/50 (52%) made recovery with NIV in the ward despite pH of <7.20 (5/50 had pH of <7.0).

14/48 (29%) had died during subsequent one year (survival status unavailable=2). Readmission rate was 74% and 48% were admitted more than once (x1 =13 pts, x2=8 pts, x3=4 pts, x4= 4 pts, x5=6 pts, x6=1 pt, x7 =1 pt).

**Conclusions:** One third of patients who were discharged after receiving NIV for an exacerbation of COPD died in the subsequent year. Majority of these patients required readmission, many more than once. Further research is required to optimally treat this high risk group to improve quality of life and reduce health care utilization.

1. Plant P K et al. *Lancet* 2000;355: 1931-5

**P3791****Outcome analysis of "do not resuscitate" versus "full resuscitation" patients with an acute exacerbation of COPD treated with noninvasive ventilation in a pulmonary unit**

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**Introduction:** Noninvasive ventilation (NIV) is common practice in acute respira-

tory failure due to acute exacerbation of COPD (AECOPD). NIV is administered to patients with both "Do Not Resuscitate" (DNR) and Full Resuscitation (FR) order. Little is known about the outcome of DNR-patients treated with NIV in a pulmonary unit, compared to patients with a FR order.

**Methods:** In a single centre study, during a period of three years, we followed all patients with AECOPD who underwent NIV in a pulmonary unit (n= 67). NIV was initiated in case of respiratory acidosis with pH<7.35, using a stepwise protocol. Resuscitation policy was established earlier in the outpatient clinic or in the emergency unit at presentation. The outcome was failure of treatment, which was defined as 1) in-hospital mortality, 2) mortality within three months after discharge and 3) transfer to the ICU (only in the FR-group). The results of the DNR-group (n=22) and the FR-group (n=45) were compared.

**Results:** In the DNR-group 9 patients died in the hospital and another 3 died within three months after discharge (total failure: 55%). In the FR-group 1 patient died in the hospital, no extra mortality was observed within three months after discharge and 11 patients were transferred to the ICU (total failure: 27%) (Fisher exact p <0.05).

**Conclusion:** There was more failure of treatment in the DNR-group than in the FR-group. However, still a substantial number in the DNR-group benefited from NIV. To clarify in which DNR-patients NIV should be performed, further research is warranted to identify parameters predicting outcome.

**P3792****P3793****Pulmonary gas exchange during mechanical non invasive ventilation in acute hypercapnic patients with obesity hypoventilation syndrome (OHS)**

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**Introduction:** It is well known that non invasive ventilation in chronic respiratory diseases improves arterial blood gases by enhancing alveolar ventilation without relevant changes in ventilation-perfusion (VA/Q) relationships. (*O.Diaz et al., Am J Res Crit Care 1997;156:1-6*). The adequate patient-ventilator synchronism throughout the breathing cycle should be a priority to ensure appropriate alveolar ventilation.

**Hypothesis:** We hypothesize that Pressure Support Ventilation (PSV) may be a useful modality of non invasive ventilation in hypercapnic patients with a restrictive ventilatory defect due to Obesity Hypoventilation Syndrome (OHS).

**Aims:** To this end, the effects of PSV versus VSV (volume support ventilation) on pulmonary gas exchange were analyzed in twenty hospitalized patients with hypercapnic respiratory failure due to OHS (BMI: 39±3 kg/m<sup>2</sup>). Blood Gases at the time of the study (F<sub>I</sub>O<sub>2</sub> 0.21): pH (7.34±0.05), PaO<sub>2</sub> 55±10 mmHg, PaCO<sub>2</sub> 62±5 mmHg, (A-a)O<sub>2</sub> 21±7mmHg.

**Methods:** Pulmonary gas exchange were measured at 30' in each of the conditions:

a) baseline; b)PSV (BiPAP Vision System, Respironics) or VSV (BREAS, PV) in random order; keeping FIO<sub>2</sub> and PEEP (4cm H<sub>2</sub>O) unchanged. The ventilatory settings were established according to patient's comfortability.

**Results:** Compared with baseline, PSV increased PaO<sub>2</sub> (64±10 mmHg, p<0.02) and decreased PaCO<sub>2</sub> (50±8 mmHg, p<0.01) similar to VSV (PaO<sub>2</sub> 62±12 mmHg, ns, PaCO<sub>2</sub> 52±10 mmHg, p<0.01).

**Conclusions:**

- PSV and VSV showed a similar improvement of respiratory arterial blood gases compared with baseline.
- Changes in PaO<sub>2</sub> during PSV and VSV were explained by enhanced alveolar ventilation.

**P3794**

**Predictors of non-invasive ventilation outcome in chronic obstructive pulmonary disease and pneumonia**

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Pneumonia has been identified as risk factor of Non-Invasive Ventilation (NIV) failure in patients with acute hypercapnic respiratory failure (AHRF) with or without chronic obstructive pulmonary disease (COPD). However, predictors of NIV failure have not yet been established. This retrospective pilot study assessed the likelihood of C-reactive protein (CRP) and chest radiograph (CXR) changes in predicting NIV outcome in patients whose ceiling of treatment is NIV. 25 COPD patients (male=12, mean age 75.7) had NIV for AHRF between July and December 2010. 68% (17/25) had consolidation on CXR and 44% a CRP >100. The mean duration of NIV was 2.73 days (SD 2.88). NIV failed to improve AHRF in 6/25 patients. Of the 19 survivors, 12 (63%) had CXR changes, 8 (42%) a CRP >100 and 6 neither CXR changes nor CRP >100. Table 1 summarises the relationship between admission CRP, CXR changes and outcome.

Relationship between CRP, CXR changes and outcome

|                   | CRP <100            | CRP >100           | Total               |
|-------------------|---------------------|--------------------|---------------------|
| CXR Normal        | 6 (W=6 F=0) 100%    | 2 (W=1 F=1) 50%    | 8 (W=7 F=1) 87.5%   |
| CXR Consolidation | 8 (W=5 F=3) 62.5%   | 9 (W=7 F=2) 77.7%  | 17 (W=12 F=5) 70.6% |
| TOTAL             | 14 (W=11 F=3) 78.6% | 11 (W=8 F=3) 72.7% | 25 (W=19 F=6) 76%   |

W = wean, F = fail. Percentage represent patients weaned.

Neither CRP nor CXR were found to be discriminatory parameters in predicting NIV success. Contrary to prevailing opinion, 70.6% of patients with consolidation on CXR regardless of their CRP were weaned from NIV. Larger studies need to identify markers of NIV failure along with a valid scoring system for patients with pneumonia and AHRF whose ceiling of treatment is NIV. The existing data suggesting NIV failure in pneumonic consolidation associated with AHRF needs to be evaluated in this context.

**P3795**

**Non-invasive ventilation (NIV) in acute respiratory failure in a respiratory intermediate unit care (RICU) – Characterization and predictors of failure**

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**Aims:** The use of NIV has proliferated in the last decades in order to support patients with acute respiratory failure. We aimed to analyze NIV's success in RICU.

**Methods:** A systematic retrospective review was performed of all hospitalized patients for NIV in our RICU, from February 1 to July 31, 2010.

**Results:** NIV was performed in 79 patients, 73% were male, with a mean age of 70 years (35-93). Reasons for NIV were acute respiratory failure in 66 patients and continuation of NIV resulting from step-down ICU in 13. Six patients had hypoxemia, 64 hypercapnia and 9 mixed acidosis. Most patients had chronic diseases (cardiac and respiratory), 62% had previous hospital admissions and 27% previous invasive mechanical ventilation. Infectious respiratory exacerbations were the main cause for admission. In 18 patients do not intubate decision was made. Average stay in RICU was 10 days (1-76). The majority of the patients had favorable evolution under NIV (57), however there were 22 NIV failures, with 5 ICU transfers. Concerning the group of NIV failure, they were significantly older (p=0,042), showed more previous hospital admissions (p=0,030), more nosocomial respiratory infections (p=0,000), a lower PaO<sub>2</sub>/FiO<sub>2</sub> (p=0,015), more extensive radiological disease (p=0,017), more neoplastic underlying disease (p=0,031), more renal disease (p=0,009) and end-stage palliation (p=0,000).

**Conclusion:** NIV is a common and indispensable treatment in a RICU. NIV's results are in accordance with the severity of underlying disease, acute exacerbations and with the use of NIV as ceiling support.

**P3796**

**Survival of COPD patients after their first episode of acute exacerbation treated with non-invasive ventilation**

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**Objective:** To describe the survival of patients surviving the first episode of COPD exacerbation requiring the use of Non-invasive positive ventilation (NIV) in 2002 and 2007 with secondary aim of comparing survival difference between these two one-year periods.

**Background:** Data on long term survival of patients surviving their first episode of acute exacerbation treated with NIV are scarce. Advances in COPD management may improve survival over the years.

**Method:** Patients surviving their first episode of acute exacerbation treated with NIV in a regional hospital in the years of 2002 and 2007 were retrospectively reviewed. Two Kaplan-Meier curves were plotted by Epi Info which are compared using log-rank test.

**Results:** A total of 90 and 73 patients requiring NIV were identified in 2002 and 2007 respectively: 13 and 41 patients died within the same admission; 26 and 9 patients were not first time users; 18 and 17 patients suffered from medical diseases other than COPD. As a result, 33 and 15 patients surviving the first episode of COAD exacerbation requiring the use of NIV in 2002 and 2007 were identified. Overall, the mean age of enrolled cohorts were 76.48 (7.60) and 73.60 (7.00) respectively, with 78.8% and 80.0% males. The median survival was 665 and 539 days. Survival at 1, 2 and 3 years was 61% and 53%, 45% and 33%, 39% and 33%. The predominant cause of death was COPD and contributed to 16 and 8 patients. The Kaplan-Meier survival curves were statistically equivalent with p value of 0.07.

**Conclusion:** The survival of patients surviving the first episode of COAD exacerbation requiring NIV remains poor, and does not differ between the two one-year periods.

**P3797**

**Noninvasive positive pressure ventilation in elderly patients with acute respiratory failure due to severe pneumonia**

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This study was retrospective observational study of Noninvasive positive pressure ventilation (NPPV) in elderly (≥ 65 yrs) patients with acute respiratory failure (ARF) due to severe pneumonia. The aim of this study was to evaluate the clinical characteristics, prognosis, predictors of failure of NPPV in elderly patients with ARF due to severe pneumonia including do-not-intubate (DNI) status. Elderly patients with ARF due to pneumonia who receive NPPV as a first line intervention (n=46) were enrolled retrospectively during 2002-2009.

The mean (± SD) APACHE II and age were 22±6 and 80±7 yrs, and the NPPV success rate and 90-day mortality rate were 48% and 52%, respectively. The DNI patients were 21 cases, 46% of the whole, and NPPV success rate and 90-day mortality rate was 51% and 71%, respectively. In multivariate analysis, pH >7.44 at basal (OR7.41, 95%CI 1.14-48.11) and PaO<sub>2</sub>/FIO<sub>2</sub> ≤ 135 after 24 hours (OR16.83, 95%CI 2.23-124.89) were independently associated with failure of NPPV. Failure of NPPV (OR25.3, 95%CI 2.70-236.79) and DNI status (OR13.2, 95%CI 1.32-131.81) were independently associated with the risk factors for 90-day death. It was acceptable to perform NPPV as a first line therapy for elderly ARF patients severe pneumonia, including DNI status.

**P3798**

**Survey of non-invasive ventilation use for acute respiratory failure in respiratory wards in Poland**

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**Introduction:** Non-invasive ventilation (NIV) is one of the most important developments in pulmonology over the last two decades. NIV reduces need to intubation and mortality in acute respiratory failure secondary to several conditions. NIV requires qualified staff and access to appropriate equipment. Aim of the study was to assess use of NIV in respiratory wards (RW) in Poland and to reveal main obstacles and difficulties in its use.

**Methods:** Using survey methodology we developed a questionnaire comprising 11 questions about methods, indications and technical aspects of NIV. Survey was sent by mail to all hospitals with RW in Poland.

**Results:** Prevalence of NIV according to hospital grade is shown in table.

Prevalence of NIV according to hospital grade

| Type of hospital                              | Primary  | District | Academic and other* | Total      |
|---|----------|----------|---------------------|------------|
| Number of hospitals with RW (% of all)        | 48 (43%) | 39 (35%) | 24 (22%)            | 111 (100%) |
| Number of responders (% within hospital type) | 13 (27%) | 23 (59%) | 11 (46%)            | 47 (42%)   |
| Number of RW using NIV (% of responders)      | 1 (8%)   | 9 (39%)  | 7 (64%)             | 17 (36%)   |

\*research institute, specialized center.

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NIV is used in 75% of RW with high dependency unit (HDU) and in 27% without HDU. The main indication to NIV has been acute exacerbation of COPD, 73% of all patients treated with NIV. Majority of RW (71%) treat up to 5 patients per month.

Main obstacles to development of NIV is lack of equipment and adequate structure of the ward.

**Conclusions:** Prevalence of NIV availability within RW in Poland is low and strongly depends on the grade of hospital and the presence of HDU.

**P3799****Can non invasive ventilation be effective without a dedicated service?**

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**Introduction:** UK guidelines recommend that Non Invasive Ventilation (NIV) should be administered in a dedicated setting with specially trained staff [1]. Our institution is a large district general hospital serving a population of 330,000 in the North West of England. NIV is used on the admissions unit and respiratory wards. Despite very frequent use the service runs without recurrent funding, dedicated staff or educational program. The aim of our service evaluation was to establish whether our service is safe and effective.

**Method:** We retrospectively audited NIV treatment episodes between January - March 2009. If NIV was discontinued but restarted after 72 hours this was regarded as a new episode.

**Results:** We identified 45 NIV treatment episodes, averaging 21.8 patient-hours a day. Our patient group comprised 14 female and 25 male patients, with a mean age of 73.1 yrs (range 56-93 yrs). The mean duration was 45 hours (range 5-158). 27 (60%) were diagnosed as an exacerbation of COPD, 13 as pneumonia (29%) and 4 (6%) as cardiogenic pulmonary oedema. 25 episodes (56.6%) had no treatment plan documented in case of failure of NIV (56.6% COPD, and 56.6% of non COPD). 10 patients (22%) died (33.3% of COPD patients, 14.8% of non COPD) and 1 (2.2%) was referred to ICU.

**Conclusion:** Our mortality rate in COPD patients is comparable to a recent national audit [2]. However, there is evidence of less advance treatment planning and ICU referral.

**References:**

- [1] National Institute of Clinical Excellence: Management of COPD in adults in primary and secondary care. Downloaded from <http://guidance.nice.org.uk/CG101> on 22/3/2010.
- [2] Roberts C.M et al. *Thorax* 2011; 66(1):43-8.