score (SGRQ) at baseline. K,co SR significantly deteriorated in both groups during follow-up ($p<0.001$ in both cases) but this was not true for FEV_1 SR. Group B had a significantly faster decline in K,co than Group A ($p=0.005$) resulting in all values falling below the LLN.

Conclusion About half of the A1AD patients with an isolated FEV_1 abnormality at baseline have a decline in K,co faster than expected. Whether exacerbations, treatment or emphysema distribution relates to faster decline remains to be determined.

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NIV: the acute and domiciliary settings

S65 INTERIM DATA FROM A RANDOMISED CONTROLLED TRIAL OF AVERAGE VOLUME-ASSURED PRESSURE SUPPORT (AVAPS) VERSUS SPONTANEOUS-TIMED (ST) PRESSURE SUPPORT IN OBESITY HYPOVENTILATION SYNDROME (OHS)

doi:10.1136/thx.2010.150938.16

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Introduction The obesity epidemic is leading to an increase in respiratory morbidity including sleep disordered breathing (SDB). The optimal ventilatory strategy in OHS is yet to be characterised. Changes in the respiratory system compliance through sleep and positional variations could compromise the effectiveness of fixed level pressure support thus the idea of varying pressure support to maintain tidal volume is appealing. Published data show improvements in nocturnal control of SDB in OHS using AVAPS mode ventilation (Storre *et al*, 2006) but also concerns regarding sleep fragmentation (Janssens *et al*, 2009). Data from these studies have been difficult to interpret as patient set up has not been set out to minimise the differences between modes.

Method Consecutive patients admitted for setup of domiciliary NIV were randomised to either ST or AVAPS mode (BiPAP Synchrony, Philips-Respironics, Murrysville, USA). NIV was titrated to improve nocturnal oximetry-capnometry using a standard setup protocol. Patients had baseline investigations including anthropometrics, health related quality of life and gas exchange. A subset of patients had sleep disruption monitored via actigraphy (AW64, Philips-Respironics, Murrysville, USA) in the week following discharge.

Results 50 patients were enrolled, mean age 55±11 years, 53% male, BMI 50±7 kg/m^2, $PaCO_2$ 6.85±0.81 kPa, PaO_2 8.91±1.55 kPa, ESS 12±6 with preliminary data available at 6 weeks for 43 patients, 13 were initiated acutely and 30 were elective admissions. No significant between group differences (Abstract S65 Table 1). Actigraphy analysis (AVAPS n=16, ST n=17) during 1st week of NIV showed total sleep time of 347±80 min in AVAPS and 348±78 min in ST with sleep efficiency of 81±6% in AVAPS and 79±12% in ST. Arterial blood gas analysis at 6 weeks showed no between group differences. However, significant improvement occurred in $PaCO_2$ in AVAPS patients, mean difference 0.63 kPa ($p=0.013$), that did not reach significance in ST, mean difference 0.55 kPa ($p=0.053$).

Abstract S65 Table 1

	AVAPS (n=22)	ST (n=21)
Age (years)	54±9	56±12
Gender (%male)	50	57
BMI (kg/m^2)	48±7	51±7
ESS (/24)	11±6	14±6
Baseline $PaCO_2$ (kPa)	6.93±0.77	6.77±0.85
Baseline PaO_2 (kPa)	9.08±1.14	8.72±1.91
Mean delivered Ipap	23±5	23±4
4%ODI	23±17	20±15
Mean nocturnal SpO_2	92±3	92±4
Mean $tcCO_2$	7.0±0.6	7.2±1.1
Δ$PaCO_2$ (kPa)	−0.63±1.1	−0.55±1.2
ΔPaO2 (kPa)	0.1±1.3	0.7±1.4

Conclusion The preliminary data indicate no significant sleep disruptive effect of AVAPS mode compared to ST following initiation of NIV for OHS. There was no clinically significant difference between groups in the primary outcome of change in $PaCO_2$, although there was only a significant fall in $PaCO_2$ in the AVAPS group. 3 months data are awaited.

S66 A RANDOMISED CROSSOVER TRIAL OF PRESSURE SUPPORT VENTILATION (PSV) VERSUS PRESSURE CONTROLLED VENTILATION (PCV) IN STABLE HYPERCAPNIC CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

doi:10.1136/thx.2010.150938.17

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Introduction PSV, rather than PCV, is often the preferred mode of ventilatory support in stable hypercapnic COPD patients, although this is supported by limited data. We hypothesised that PCV would be equivalent to PSV with similar patient-ventilator synchrony, nocturnal ventilation, gas exchange and sleep quality with similar adherence to non-invasive ventilation and improvements in health related quality of life (HRQL).

Method HypercapnicCOPD patients (daytime $PaCO_2$ >6 kPa) were enrolled and randomised to PSV (low back up rate) or PCV for 6 weeks. Patients had baseline anthropometric, HRQL and gas exchange measurements, were re-assessed at 6 weeks and crossed over to the other arm with the final assessment at 12 weeks. Sleep quality was assessed using a sleep diary and nocturnal actigraphy (Actiwatch AW4, CamNTech, Cambridge, UK) for 2 weeks prior to each assessment. Subjective patient-ventilator synchrony was assessed with a questionnaire (Score 0–3, 0=good synchrony). At 6 and 12 weeks, all measurements were repeated, including ventilator adherence.

Results 12 patients were enrolled. However, three were unable to tolerate NIV and 1 failed to adhere to the study protocol. Four commenced on PSV and 4 commenced on PCV. Mean (±SD) age 72±8 years, BMI 32±9 kg/m^2, FEV_1/FVC 54±14%, FEV_1 29±11%, $PaCO_2$ 8.6±1.7 KPa and PaO_2 7.3±1.4 KPa. Mean IPAP 28±4 cm H_2O and mean EPAP 5±3 cm H_2O. Backup rate for PSV