Managing a sleep disorder service

P144 HEALTH-RELATED QUALITY OF LIFE IN OBESITY HYPOVENTILATION SYNDROME (OHS) PRIOR TO INITIATION OF HOME MECHANICAL VENTILATION (HMV)

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doi:10.1136/thx.2009.127175n

Introduction With the rising incidence of obesity, we have observed a significant increase in obesity related respiratory problems such as obesity hypoventilation syndrome (OHS). Patients with obesity-related respiratory problems can present electively with chronic respiratory failure (CRF) or as an emergency with acute on CRF. The aim of this study was to investigate differences in illness perception and health-related quality of life (HRQL) in OHS patients presenting electively or as an emergency.

Method Consecutive patients initiated on HMV at two tertiary referral centres were recruited. Baseline anthropometrics and HRQL, using severe respiratory insufficiency questionnaire (SRI), were measured.

Results Twenty-five patients were enrolled. Nine patients started HMV following acute decompensation and 16 were initiated electively. As expected, those patients presenting acutely had more pronounced hypercapnia than the group initiated on HMV electively. However, despite less severe physiological gas exchange derangement and with similar lung volumes, elective patients had a trend to more severe self-assessed impairment of HRQL scores compared with the patients presenting acutely. This trend to more severe impairment reached significance in 2/5 subscales, those relating to attendant symptoms and sleep (AS) and social relationships (SR). The difference between groups tended to significance ($p = 0.09$) in the well-being subscale (WB) (table 1).

Conclusion These data show the high symptom burden in patients with OHS and suggest that patients initiated electively have poorer perceived HRQL than patients initiated on HMV following an emergency admission. In particular, the elective patients have greater symptom perception and sleep disruption. These findings have important clinical implications to both presentation and compliance with therapy in this patient group. Patients who perceive a lower HRQL are more likely to present earlier and potentially could have a greater improvement in HRQL, which may enhance compliance.

Abstract P144 Table 1

	Emergency (n = 9)	Elective (n = 16)
Age (years)	61 (14)	54 (10)
BMI (kg/m)	50 (9)	47 (8)
$Paco_2$ (kPa)	9.64 (1.25)*	6.59 (0.57)
FVC%	51 (18)	60 (13)
FEV_1/FVC	0.79 (0.07)	0.82 (0.08)
ESS/24	11 (6)	12 (5)
SRI-SS/100	60 (12)	53 (15)
SRI-AS/100	60 (18)†	39 (14)
SRI-SR/100	80 (18)*	62 (18)
SRI-WB/100	65 (10)	52 (19)

Values are mean (SD).
*p<0.01; †p<0.05.

P145 EFFECTS OF HYPEROXIA IN OBESITY HYPOVENTILATION SYNDROME

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doi:10.1136/thx.2009.127175o

Introduction and Objectives Obesity hypoventilation syndrome (OHS), defined as a combination of obesity (body mass index (BMI) >30 kg/m^2) and awake arterial hypercapnia ($PaCO_2$ ≥45 mm Hg) in the absence of other known causes of hypoventilation, is an under-recognised and undertreated condition. When presenting acutely, these patients are often administered supplemental oxygen without consideration of hypercapnia. We sought to determine whether hyperoxia leads to worsening hypercapnia in patients with newly diagnosed OHS and to study the mechanisms of any effect.

Methods 24 patients with newly diagnosed OHS were randomised to receive either room air or 100% oxygen via a tight fitting face mask and Douglas bag for 20 min in a double-blind fashion. To ensure an adequate washout period, the patient returned for a second test on a separate day and the study protocol was repeated with the other gas. Respiratory rate (RR), transcutaneous carbon dioxide tensions ($PtCO_2$), minute ventilation (MV) and dead space to tidal volume ratio (Vd/Vt) were measured at baseline and at the end of 20 min. The primary outcome variable was the change in $PtCO_2$ from baseline. Secondary outcome variables included change from baseline in MV and Vd/Vt.

Results The results are shown in table 1.

Conclusions Hyperoxia leads to worsening hypercapnia in patients with OHS due to both an increase in the physiological dead space and a reduction in minute ventilation. Oxygen therapy should be administered with caution in these patients.

Abstract P145 Table 1

	Air		Oxygen		Mixed linear model estimates of differences	
	Baseline (n = 24)	20 min (n = 24)	Baseline (n = 23)	20 min (n = 23)	Estimate (95% CI)	p Value
$Ptco_2$ (mm Hg)	48.6 (4.0)	47.7 (5.4)	48.7 (3.8)	52.7 (6.5)	5.0 (3.1 to 6.8)	<0.001
$Ptco_2$ (kPa)	6.46 (0.53)	6.34 (0.72)	6.48 (0.51)	7.01 (0.86)	0.67 (0.41 to 0.9)	
RR (bpm)	15.8 (3.6)	15.7 (4.4)	15.6 (3.8)	14.7 (3.8)	−0.9 (−2.4 to 0.67)	0.25
MV (l/min)	9.6 (3.3)	9.0 (3.4)	10.1 (2.9)	8.0 (3.3)	−1.4 (−2.6 to −0.11)	0.03
Vd/Vt	0.58 (0.06)	0.59 (0.08)	0.57 (0.06)	0.65 (0.06)	0.067 (0.035 to 0.10)	<0.001

MV, minute ventilation; $Ptco_2$, transcutaneous carbon dioxide tension; RR, respiratory rate, Vd/Vt, dead space to tidal volume ratio.
All values are mean (SD).

P146 IS THERE A ROLE FOR ROUTINE SLEEP AND RESPIRATORY ASSESSMENT AS PART OF THE PREOPERATIVE WORK-UP OF PATIENTS BEING ASSESSED FOR BARIATRIC SURGERY?

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doi:10.1136/thx.2009.127175p

Introduction Bariatric surgery is an effective method of weight reduction in patients with morbid obesity. The association between body mass index (BMI) and obstructive sleep apnoea (OSA) is well-recognised and breathlessness is a common symptom of obesity. However, which patients have a preoperative sleep and respiratory assessment varies between services.

Aims To determine whether routine sleep and respiratory assessment is indicated prior to bariatric surgery.

Methods All patients being considered for bariatric surgery over 1 year were offered a respiratory outpatient assessment including Epworth Sleepiness Score (ESS), BMI, spirometry and limited sleep study (April 2008 to March 2009). We retrospectively evaluated the value of sleep and respiratory assessment in terms of new diagnoses and management changes.

Results Data were available for 82/86 patients (4 patients did not attend clinic); 67F;15M. Mean age was 44 (range 16–65) years, mean BMI was 48.6 (SD 8.8). 23 patients reported an existing respiratory diagnosis (16 asthma, 1 COPD, 5 OSA (3 on CPAP), 1 asthma and OSA). 24 were smokers (29%) and 22 ex-smokers. Mean oxygen saturation was 97% (range 92–100) and in 78/82 patients with spirometry mean (SD) FEV_1 was 2.54 (0.59) l and FVC 3.01 (0.67) l (65 normal, 9 restrictive and 4 obstructive (2 known asthma and 2 new diagnoses of COPD made) (2.6%)). Mean ESS was 8 (range 0–21). 75/82 patients had sleep studies with mean (range) apnoea hypopnoea index (AHI) 12 (range 0–85); AHI was 5–14.9 in 23 patients, 15–29.9 in 8 and ⩾30 in 11 patients. 19/75 patients (25%) had OSA (AHI ⩾15), of whom 17/75 (23%) were previously undiagnosed. ESS did not predict AHI; 4 patients had an ESS <5 and an AHI >30. The results are shown in table 1.

Conclusion We found a high prevalence of undiagnosed OSA, but relatively little other undiagnosed respiratory morbidity in this population. We recommend that all patients being considered for bariatric surgery are assessed and offered a limited sleep study irrespective of their ESS, given its lack of predictive value in this population and the implications of OSA on perioperative management and long-term morbidity.

Abstract P146 Table 1 Patient characteristics according to apnoea-hypopnoea index (AHI)

	AHI <15 (n = 56)	AHI ⩾15 (n = 19)
Mean (range) age (years)	43 (16–65)	45 (26–61)
Men, n	4	7
% men having sleep study	36%	64%
Mean (SD) BMI	47 (9)	53 (9)
Mean (range) ESS	8.0 (0–21)	8.6 (0–19)
CPAP offered	1	18

BMI, body mass index; CPAP, continuous positive airway pressure; ESS, Epworth Sleepiness Score.

P147 A STUDY OF OBSTRUCTIVE SLEEP APNOEA IN PATIENTS WHO HAVE UNDERGONE BARIATRIC SURGERY

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doi:10.1136/thx.2009.127175q

Background Obesity is a major risk factor for obstructive sleep apnoea (OSAS), and patients who achieve weight loss after bariatric surgery are reported to have an improvement in OSAS. We have analysed our patient population to investigate this.

Methods All bariatric surgery patients who had a preoperative sleep study between May 2007 and January 2009 were included. The preoperative Epworth Sleep Score (ESS) and apnoea-hypnoea index (AHI) were noted. Between 6 and 24 months postoperatively, the ESS, weight loss and use of continuous positive airway pressure (CPAP) were reassessed.

Results Of 211 patients being referred for bariatric surgery, 57 (27%) were referred for sleep studies because of suggestive clinical features (hypersomnolence and/or witnessed apnoea). The results for the 39 patients available for follow-up are shown in table 1.

Abstract P147 Table 1

	CPAP prescribed and used pre and postoperatively and until follow-up	CPAP prescribed and used preoperatively but no longer in use at time of follow-up	No CPAP
Number	9 (6F)	15 (8F)	15 (13F)
Mean (SD) ESS preoperatively	15.67 (2.59)	13.46. (6.4)	10.73 (5.94)
Range	12–20	4–24	1–19
Mean (SD) ESS postoperatively	7.33 (5.26)	5.8 (5.32)	6.33 (4.15)
Range	2–17	0–21	1–16
Mean (SD) change in ESS	−8.11 (6.64)	−7 (10.21)	−4.4 (5.22)
Range	−18 to +2	−24 to +12	−17 to +2
p Value for change in ESS pre and postoperatively	0.004	0.008	0.005
Mean (SD) weight loss (kg)	51.2 (18.24)	38.93 (15.1)	40.82 (17.67)
Range (kg)	28.3–79.4	12.7–69.8	22.2–81
No with ESS ⩾10 (%)			
Preoperatively	9/9 (100%)	9/15 (60%)	8/15 (53%)
Postoperatively	2/9 (22%)	3/15 (20%)	2/15 (13%)
Mean (SD) AHI preoperatively	56.93 (34.3)	48.38 (19.96)	11.26 (15.16)
Range	11.6–105	5.8–77.8	0.6–49

AHI, apnoea-hypopnoea index; CPAP, continuous positive airway pressure; ESS, Epworth Sleepiness Score.

Conclusions There is a significant improvement in ESS with weight loss after bariatric surgery in all groups, with two thirds of patients stopping CPAP due to perceived improvement in symptoms. However, despite this perceived improvement in symptoms following weight loss, 20% still have ESS ⩾10. Whether this improvement is maintained is unclear but we recommend sleep review of all patients prescribed CPAP at 6–9 months post bariatric surgery.

P148 HAS THE BODY MASS INDEX OF THE POPULATION REFERRED FOR INVESTIGATION OF OBSTRUCTIVE SLEEP APNOEA CHANGED OVER AN 8-YEAR PERIOD?

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doi:10.1136/thx.2009.127175r

Introduction The prevalence of obesity, defined by the World Health Organization as a body mass index (BMI) greater than 30 kg/m^2, is increasing in all developed countries. Obesity is a risk factor for obstructive sleep apnoea (OSA). Each year our sleep service receives more referrals for investigation of patients with suspected OSA. It is currently unclear whether this increase is due to better primary care or population awareness of OSA (and hence higher rates of diagnosis), or simply a consequence of the increase in obesity within the general population. Data previously presented from this trust indicates that disease severity, measured by hourly dip rate on overnight oximetry or Epworth Sleepiness Score (ESS), has not increased over the previous decade, while the numbers of referrals have markedly increased. We hypothesised that the yearly rise in referrals over the last decade was associated with increasing obesity within the referred population over this time period.
Methods Data from patients referred to the sleep service of a large UK teaching hospital for overnight oximetry in the first 6 months of alternate years between 1999 and 2007 were retrospectively collected including age, sex, height, weight and date of oximetry. Exclusion criteria included age younger than 16 or a previous diagnosis of OSA. Data were analysed using the Kruskal-Wallis test, with a p value of <0.05 taken as statistically significant.
Results 445 cases were identified, 313 had information enabling BMI to be calculated. Data are presented in table 1. The number of referrals increased steadily from 48 in 1999 to 152 in 2007. Median BMI was more than 30 kg/m^2 in each year studied, but there was no significant difference in median BMI of the population over this time period ($p = 0.81$).
Conclusions The data presented here suggest that the median BMI of patients referred for investigation of OSA has not changed over the years studied, contradicting our initial hypothesis. Further studies in this area should consider using larger sample sizes and if possible population-based study populations.

Abstract P148 Table 1 Numbers of patients investigated for obstructive sleep apnoea (OSA) and median body mass index (BMI) in the study sample, 1999–2007

Year	Number of referrals (n = 445)	Data available (n = 313)	BMI (kg/m^2)
1999	48	31	33.2 (27.4–39.3)
2001	66	37	31.3 (28.9–37.7)
2003	87	64	31.5 (27.2–38.3)
2005	92	71	31.0 (28.1–38.0)
2007	152	110	33.1 (27.9–39.0)

BMI presented as median (interquartile range).

P149 CAN CONTINUOUS POSITIVE AIRWAY PRESSURE CAUSE A CHANGE IN BODY MASS INDEX?

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doi:10.1136/thx.2009.127175s

Introduction Obesity is a major risk factor for OSAHS (obstructive sleep apnoea-hypopnoea syndrome) and the development of metabolic syndrome. Weight loss can be an effective treatment for OSAHS, decreasing the severity of OSAHS or possibly leading to complete resolution in some patients. Controversy exists in the scientific literature about the effect of continuous positive airway pressure (CPAP) therapy on weight. On the one hand it is expected that effective CPAP therapy may lead to weight loss mainly due to improving symptoms in sleepy apnoeic patients, making patients more active and motivated and therefore more likely to lose weight. Conversely, CPAP may increase the body weight due to its effect on leptin levels.
Method Retrospective case note review of 102 patients seen in the sleep clinic and diagnosed with OSAHS requiring CPAP therapy between April 2007 and 2009. Patients were weighed pre-CPAP and also at 3 and 6 months after starting CPAP. Patients on weight loss medications were excluded from our analysis.
Results The M:F ratio was 5:1 and the mean age was 52.3 years (range 22–77). The results are shown in table 1. The Epworth Sleepiness Scale (ESS) pre-CPAP was 11.0 and at 3–6 months it was 2.9. Mean CPAP pressure was 8.2 cm H_2O (range 5.5–14).
Conclusion CPAP did not appear to reduce body mass index (BMI) in our cohort, despite a significant decrease in ESS. Our experience shows a tendency to gain weight even at short-term follow-up, contrary to other studies showing initial weight loss, then later weight gain at 1 year. This is seen in particular in women in our study. This confirms the importance of an active weight loss programme and not informing patients that CPAP itself will lead to weight loss. We suggest that an increase in the provision of resources to reduce obesity needs to be factored into future healthcare budgets. We now routinely record both BMI and waist circumference in all our patients at each follow-up appointment to analyse whether CPAP can alter body fat distribution rather than total weight and therefore BMI. Body fat distribution is important not only in the pathogenesis of OSA but in reducing the risk of developing metabolic syndrome and cardiovascular disease.

Abstract P149 Table 1

	Men	Women
Pre-CPAP BMI (kg/m^2)	35.7	35.0
3–6 month BMI	35.0	35.8
CPAP usage (h/night)	6.1	6.2
CPAP usage (% nights)	88.2	87.9

BMI, body mass index; CPAP, continuous positive airway pressure.

P150 RATES OF KNOWN DEPRESSIVE ILLNESS IN PEOPLE ATTENDING A SLEEP DISORDERED BREATHING CLINIC

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doi:10.1136/thx.2009.127175t

Introduction High rates of depression have been reported in patients with the obstructive sleep apnoea-hypopnoea syndrome (OSAHS),

Abstract P150 Table 1

	Received treatment for depression (%)	Never treated for depression (%)	Not recorded (%)
OSAHS (n = 437)	4	63	33
Non-OSAHS (n = 97)	6	63	31

OSAHS, obstructive sleep apnoea-hypopnoea syndrome.

but whether this reflects another co-factor or whether OSAHS is a cause of depression remains debated. We compared rates of known/treated depression in subjects attending a sleep-disordered breathing clinic.

Methods A retrospective review of prospectively recorded information in a database for a sleep-disordered breathing clinic at a district general hospital. We selected a random sample of 534 subjects with complete data regarding sleep studies. All were referred between 2004 and 2008 to a respiratory physician with daytime tiredness and most had a history of snoring or apnoeas. We defined OSAHS as daytime sleepiness and a 4% dip rate of >15 events/h and/or apnoea-hypopnea index >20 events/h on limited channel overnight sleep study (Embletta or Visilab). Those with symptoms of narcolepsy, restless legs or parasomnias were excluded. Medical notes, patient histories (sleep clinic) and GP prescription charts were cross-checked. We compared the prevalence of people ever prescribed antidepressants or who had received counselling for depression in those attenders who eventually turned out to have OSAHS and those without OSAHS (χ^2 test).

Results The results are shown in table 1; p = 0.583 (Pearson χ^2).

Conclusion In this sample there was no increased prevalence of known depressive illness in those who eventually turned out to have OSAHS compared with those with daytime somnolence who had negative sleep studies. Both groups had similar (recorded) depression rates to the background population for this age group. Further work is needed to see if depression is undiagnosed or is increased only in those with severe OSAHS.

P151 PREVALENCE OF SYMPTOMATIC OBSTRUCTIVE SLEEP APNOEA AND NOCTURNAL HYPOXIC LOAD IN ADULT SICKLE CELL DISEASE

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doi:10.1136/thx.2009.127175u

Introduction There is an increased prevalence of obstructive sleep apnoea (OSA) and nocturnal hypoxia in paediatric patients with sickle cell disease (SCD) which has been associated with an increased risk of acute painful crisis and stroke. As hypoxia is important in the aetiology of crises, we investigated the prevalence of symptomatic OSA and nocturnal hypoxic load in adult patients with SCD.

Methods Sequential adult patients with SCD attending routine haematology outpatient clinic were offered participation in the study. Patients completed an Epworth Sleepiness Score (ESS) and those with a score ⩾11 or with clinical suspicion of OSA were offered overnight domiciliary oximetry. Oximetry traces were analysed independently by four experienced sleep physicians and patients were attributed an interpretation of (a) OSA; (b) nocturnal hypoxia (non-OSA); (c) non-diagnostic/inadequate; and (d) normal. OSA was quantified by 4% dip rate per hour and 6 bpm heart rate increase with overall hypoxic load assessed by both the mean nocturnal oxygen saturations (Spo_2) and sleep time with Spo_2 <90%.

Results 93 patients completed ESS with 34 patients identified for nocturnal oximetry (26 ESS >11, 8 clinical suspicion). 22 of the 34 (65%) had an oximetry study with a median ESS 11 (range 4–16), mean diurnal Spo_2 96±4%, mean nocturnal Spo_2 91±4%. 17 of the 22 oximetry studies were abnormal (65% OSA); interobserver agreement was 0.63. The results are summarised in table 1.

Conclusion These data confirm the high proportion of sleep-disordered breathing in this patient population with 17 patients

Abstract P151 Table 1

ESS	Clinic Spo_2	>4% dips/h	HR rises (>6)/h	Minimum Spo_2	Mean Spo_2	Sleep time <90%
13	100	18.42	31.7	46	93	16
13	92	18.9	38.5	54	90.5	25.4
16	98	2.88	26.52	82.2	95.8	0.4
13	89	12.2	35.6	47.8	86.5	92.6
4	87	7.8	31.5	70	83.8	99.7
9	93	6.37	32.85	60.5	87.48	93.74
7	94	3.43	3.75	42.4	88.75	78.5
10	98	9.65	39.4	77.8	92.43	9
12	90	1.39	20.27	78.5	84.2	100
16	98	9.3	30.2	66.6	89.1	41
11	98	2.64	17.33	78.5	94.5	8.5
10	96	12.3	69.9	76.4	88.12	85.6
11	98	3.49	49.93	73	97.4	2
11	100	5.7	33.1	76.6	94.3	2
15	99	19.6	24.5	38.8	86.5	79.8
11	99	21.5	21.4	62.6	90	33
15	97	4.85	39	65	93.5	4.7
11	98	5.19	56.4	32.7	96.2	1.11
16	98	1.91	5.41	84.4	96.7	0.16
10	96	8.36	27.23	74.5	88	90
12	100	0.72	55	90	96	0
21	95	10	35	73	88.75	72

ESS, Epworth Sleepiness Score; HR, heart rate; Spo_2, oxygen saturation.

having OSA and/or low nocturnal saturations. Diurnal Spo_2 was a better predictor of hypoxic load than ESS. Further work is needed to examine the significance of the hypoxic load on clinical outcomes in SCD and the role of nocturnal oxygen and positive airway pressure at correcting hypoxia.

P152 SCREENING FOR OBSTRUCTIVE SLEEP APNOEA SYNDROME IN A CARDIAC PREVENTION AND REHABILITATION PROGRAMME

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doi:10.1136/thx.2009.127175v

Background Obstructive sleep apnoea syndrome (OSAS) affects 2–4% of the population and is more likely in men, those who are obese or >65 years of age. Repetitive apnoeas may result in increased cardiovascular stress including a reduction in myocardial contractility, activation of the sympathetic nervous system and resistant hypertension. Preliminary data suggest that treating OSAS with continuous positive airway pressure (CPAP) may lower blood pressure and, in patients with heart failure, improve cardiac function. Yet OSAS remains significantly underdiagnosed. We hypothesised that patients with cardiovascular disease were more likely to have OSAS than the general population due to shared risk factors, and that screening for this during a cardiac rehabilitation programme would detect undiagnosed OSAS.
Aim To determine the likelihood of undiagnosed OSAS in patients attending a cardiovascular disease prevention and rehabilitation programme (CRPR).
Methods Sequential patients attending CPRP at Charing Cross Hospital were sent the Epworth Sleepiness Scale and a pilot screening tool for witnessed apnoea prior to attendance at the programme. Those scoring an ESS ⩾10/24 or reporting witnessed apnoea were referred for a sleep study at Imperial College Healthcare Sleep Centre. Results were analysed for the apnoea frequency (AHI) and oxygen desaturations (ODI) per hour. Those who were positive for OSAS were offered treatment with continuous positive airway pressure (CPAP) or lifestyle modifications.
Results 80/101 sequential attendees consented to participate (85% men, mean age 64.5±10.1 years: 65.9±8.5 M and 64.0±10.1 F). 23 patients had hypersomnolence (ESS ⩾10/24), witnessed apnoea or both. To date, 11 patients have had a sleep study, 7 have declined a study and 5 are awaiting a study. Of the 11, all have been found to have evidence of OSAS with 5 in the severe range (AHI ⩾30 events/h), 2 in the moderate range (AHI 15–29 events/h) and 4 with mild pathology. After clinical review, 6 were thought to merit CPAP therapy.
Conclusion Screening for OSA in a CPRP was feasible and resulted in detection of previously unrecognised OSAS. Treatment of this disorder may help reduce their cardiovascular risk in the longer term.

P153 IS THE NEW SERVICE SPECIFICATION FOR INVESTIGATION AND TREATMENT OF OBSTRUCTIVE SLEEP APNOEA SYNDROME (MARCH 2009) AN APPROPRIATE COMMISSIONING TOOL?

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doi:10.1136/thx.2009.127175w

Introduction Following the NICE Technology Appraisal for obstructive sleep apnoea syndrome (OSAS),[1] many new sleep services will be commissioned. To help this process, the service specification for investigation and treatment of OSAS was produced jointly by the BTS, ARTP, General Practice Airways Group and the Sleep Apnoea Trust and published in March 2009.[2] It suggests referral rates, uptake of continuous positive airway pressure (CPAP) and outcome measures (see table 1). We examined these parameters in an established sleep unit in a DGH serving a population of 330 000 to see if these specifications were appropriate.

Abstract P153 Table 1

Service specification for population 330 000	Specification suggests	This study
Referrals	330	547
CPAP started	132	190 (110 continued)
Success with ESS >12 and AHI>30	90%	86%

Method Data were obtained from a sleep database over 1 year and included parameters from respiratory polysomnography and details of CPAP treatment. Data were collected prospectively.
Results 547 new referrals were made. 190 patients with an Epworth Sleepiness Score (ESS) of >10 were started on CPAP therapy. Of these, 53 had an apnoea-hypopnoea index (AHI) >30, 44 (83%) had continued CPAP; 26 had an AHI of 15–30 and 18 (69%) continued CPAP; 38 patients had an AHI of 5–14, 22 (58%) continued CPAP. 73 patients had a trial of nasal CPAP, 27 had an AHI of <5, 8 (30%) continued, 46 had an ESS >10 and had evidence of upper airways resistance, 18 (39%) continued. Overall, 36% of those trialled continued with CPAP. 42 had "more severe disease", defined as an ESS >12 and AHI >30, 36 (86%) continued CPAP.
Conclusion These results suggest that the service specification could underestimate referrals and patients started on CPAP. The latter are predominantly due to sleepy patients with symptoms of sleep-disordered breathing but who have a low AHI and may require a trial of nasal CPAP. The suggested outcome measure of compliance with CPAP of 90% with patients with an ESS >12 and AHI >30 could also be utilised nationally, possibly as a government Indicator of Quality Improvement.

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P154 SETTING UP A SLEEP APNOEA SERVICE POST NICE: OUR EXPERIENCES

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doi:10.1136/thx.2009.127175x

Background Basildon University Hospital is a large district general hospital. A new sleep service was started in August 2008 following the NICE guidance on continuous positive airway pressure (CPAP) treatment in obstructive sleep apnoea-hypopnoea syndrome (OSAHS).[1] We present an overview of this service to give an indication of the feasibility of starting a service, organisation and the clinical demand.
Methods We used a standardised spreadsheet to record information on patients referred for diagnosis and treatment over an 11-month period (August 2008 to June 2009). We collected data on demographics, source of referral, number diagnosed and disease severity.
Results 349 patients were referred. The average age was 55 years (range 22–80). 256 (73%) were male. The majority (256, 73%) were routed through the respiratory team. 80 (23%) were from ENT and

13 (4%) were from other departments. All diagnostic tests were done in the domiciliary setting. 161 (46%) had overnight oximetry, 131 (38%) had partial polysomnography (EMBLETTA) and 43 (12%) had both tests. 83 (24%) did not have OSAHS, 88 (25%) had severe disease, 62 (18%) had moderate disease and 116 (33%) had mild OSAHS. Four (1%) of the referrals were patients previously treated elsewhere with CPAP. The mean time to starting CPAP from diagnostic testing was 30 days. Of the 266 patients started on CPAP, 18 (7%) did not tolerate treatment. 11 of these had mild disease.

Service organisation Though the service started with a lead clinician, sleep nurse and pulmonary physiologist, the increasing workload necessitated the recruitment of a further three physiologists (part time), second sleep nurse and contributed to the need for an additional respiratory consultant.

Discussion It is feasible and practical to start a new sleep service. The awareness of OSAHS has increased in primary and secondary care and among the wider public following the NICE guidance in 2008, generating a large number of new referrals. Patients prefer being treated locally, and local patients treated elsewhere are gradually transferring care. Support from trust management and the commissioning bodies are essential for the success of this rapidly growing service.

1. **National Institute for Health and Clinical Excellence (NICE)**. *Continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome*. NICE Technology Appraisal Guidance 139, March 2008. http://www.nice.org.uk/nicemedia/pdf/TA139Guidance.pdf.

P155 CPAP THERAPY IN OBSTRUCTIVE SLEEP APNOEA-HYPOPNOEA SYNDROME: IS ROUTINE ANNUAL CLINIC REVIEW NECESSARY?

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doi:10.1136/thx.2009.127175y

Introduction and Objectives Continuous positive airway pressure (CPAP) therapy is recommended as first-line treatment in moderate to severe symptomatic OSAHS. NICE guidance on CPAP therapy states that ''long-term follow-up of patients is critical to ensure adherence''. No specific instruction on frequency or nature of follow-up is given. Current practice in our unit is for all patients established on CPAP to be reviewed annually by a sleep technician. This study was designed to look at the outcome of annual reviews to determine if telephone-based follow-up is a feasible alternative to clinic visits.

Methods The case notes of 100 consecutive patients attending for annual review of established CPAP therapy at two hospital sites were reviewed. Compliance, side effects and outcomes of review were recorded.

Results Information was available for 99 of the patients selected. Patients had been established on CPAP for a median of 40.5 months (range 6–240). Median Epworth Sleepiness Score (ESS) was 14 (4–24) prior to treatment commencement and 5 (0–22) at the review appointment analysed. Median compliance with CPAP was 6.7 h/night (0–14.7) with 13% below 3 h/night. Side effects from CPAP were reported in 32.3% of patients, most commonly poor mask fit. A composite measure of ''problem-free CPAP therapy'' was derived involving ESS <11, compliance >3 h/night and no reported side effects. Of the 89 patients for whom all three values were known, 44 (49.4%, 95% CI 39.0% to 59.8%) met this measure. Overall, 29% of patients required further investigations or changes to their management following their review appointment as opposed to 13.6% (6/44) in the ''problem-free'' group.

Conclusions Routine annual clinic visits are not necessary in all patients on CPAP. Structured telephone-based follow-up with selected recall for those where problems are detected is likely to be successful. It would result in a more efficient service with the potential for over 40% of patients to avoid a hospital visit and allow more time to be spent with those patients in whom CPAP is ineffective or poorly tolerated.

P156 CLINICAL SEVERITY STRATIFICATION AND CONTINUOUS POSITIVE AIRWAY PRESSURE RESPONSE IN OSAHS: WHAT ARE THE INFLUENCING FACTORS?

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doi:10.1136/thx.2009.127175z

Introduction British Thoracic Society guidelines recommend that severity stratification in obstructive sleep apnoea-hypopnoea syndrome (OSAHS) should be based on apnoea-hypopnoea index (AHI), Epworth Sleepiness Scale (ESS) and characteristic symptoms. The aim of this study was to identify factors that might influence the initial prescription of continuous positive airway pressure (CPAP) according to clinical severity stratification in patients with OSAHS.

Methods Retrospective analysis of 77 patients with OSAHS who were referred for automated CPAP (ACPAP) trial between April 2008 and January 2009. Based on symptom severity and its subjective impact, patients were assigned to two groups for a 7-day ACPAP trial. Group A patients (who had mild to moderate impact of their OHAHS symptoms) were referred for ACPAP trial to monitor the response before deciding on long-term CPAP, and Group B patients (with severe impact of their OSAHS symptoms) were referred for ACPAP trial prior to commencing long-term CPAP.

Results Patients in group A (n = 41) were older with lower body mass index (BMI), neck circumference (NC) and AHI compared with group B (n = 36). 29 patients (70%) from group A and 26 (72%) patients from group B went on to have long-term CPAP. In both groups there was a significant reduction of ESS at 1-month follow-up (3.2 ± 4 and 2.4 ± 3, respectively). There was no difference in CPAP tolerance between the two groups. A total of 22 patients from both groups were not prescribed CPAP; 15 of them were intolerant of the initial ACPAP trial and 7 did not find any significant benefit from CPAP. The results are shown in table 1.

Conclusion Patients with clinically mild to moderate impact of their OSAHS symptoms tend to be older, have significantly lower BMI, NC and AHI. However, this difference does not help us in predicting the subjective response or tolerance to CPAP as this was similar to the group with more severe symptomatic OSAHS. This reflects the difficulty is assessing subjective symptoms in OSAHS and reinforces the need for individually assessing and tailoring the prescription of ACPAP trial for patients with clinical mild to moderate OSAHS.

Abstract P156 Table 1

	Group A (n = 41)	Group B (n = 36)	p Value
Age (mean ± SD)	53 ± 11.3	47.6 ± 11.4	0.04
Male (%)	28 (68%)	33 (92%)	0.01
BMI	34.9 ± 8.4	39.9 ± 9.4	0.009
NC	42.2 ± 3.7	46.2 ± 4.7	0.001
Baseline ESS	11.8 ± 4.6	13.6 ± 4.2	0.08
Number of BTS symptoms	5.5 ± 1.5	6 ± 2.1	0.38
AHI	31 ± 23.9	53.5 ± 24.4	0.003

AHI, apnoea-hypopnoea index; BMI, body mass index; BTS, British Thoracic Society; ESS, Epworth Sleepiness Score; NC, neck circumference.