not be reliable predictors of safe driving. Whether poor performance on an advanced driving simulator is predictive of poor on road performance needs to be established.

P21 DOES TIME OF DAY AFFECT OUTCOMES ON AN ADVANCED OFFICE BASED DRIVING SIMULATOR IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA SYNDROME (OSAS)?

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Introduction Road traffic accidents (RTA) are known to peak at certain times of the day especially early afternoons. OSAS patients are at higher risk of being involved in RTA. Recently we have established that it is possible to identify with high degree of certainty a group of OSAS sufferers who perform significantly worse than others using specific simulator parameters on our advanced office based driving simulator (miniSim). We now explore whether the time of day when the study is performed affects simulator outcomes.

Methods 205 (52±10 yrs, ESS 12±5, AHI 33±22) patients performed a 90 km motorway driving scenario on the miniSim. Two events were programmed to trigger evasive actions, one subtle (Veer event) where an alert driver should not crash, while with the other (Brake event) even a fully alert driver might crash. There were three possible outcomes of the simulator runs; "fail", "indeterminate" and "pass". "Fail" was defined by any crash other than at the brake event and/or inability to complete the test. Comparisons were made between the patient populations performing the test before & after 12:00 in terms of demographics, symptoms & severity of OSAS. Outcomes on the simulator, lane position & reaction times were also compared between these groups.

Results There were no differences between the patients performing at the different time slots in terms of age, BMI, ESS & AHI (Abstract P21 table 1). The number of "fails", "indeterminates" & "passes" during morning & afternoon runs were: 16/26/70 (n=112) & 22/30/41 (n=93). Patients performing in the afternoon were no more likely to fail the test than those doing it in the morning (Fisher's exact test p=0.1). There were no differences in terms of lane position or reaction times (p=0.38, 0.65).

Abstract P21 Table 1 Comparing patients performing before and after 12:00 h

Parameters	Patients performing before 12:00 h (n=112) Mean (SD)	Patients performing after 12:00 h (n=93)	p Values (t tests)
Age (years)	52.7 (10.5)	52.2 (10.5)	0.74
BMI (kg/m^2)	34 (6.3)	35 (7)	0.25
ESS	11 (6)	12 (5)	0.15
AHI (events/hour)	32.6 (23.3)	32.7 (20)	0.96
ODI (events/hour)	32.6 (22.5)	35.4 (24)	0.41
SDLP (metres)	0.42 (0.15)	0.44 (0.13)	0.38
VeerRT (sec)	1.63 (0.54)	1.59 (0.47)	0.65

AHI, Apnoea Hypopnoea Index; BMI, Body mass index; ESS, Epworth Sleepiness Scale; ODI, Oxygen Destauration index; SDLP, Mean of SD of lane position; VeerRT, Reaction time at the Veer event.

Conclusion The results indicate that the time of day the study is performed is unlikely to affect outcomes on this driving simulator. It has implications for its clinical use as the test can performed at any time of the day.

P22 DO OBSTRUCTIVE SLEEP APNOEA (OSA) PATIENTS WITH NORMAL EPWORTH SCORES COMPLY WITH CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) THERAPY?

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Introduction Current recommendations suggest CPAP treatment in patients with OSA and excessive daytime sleepiness. The Mosaic trial showed a reduction in Epworth Sleepiness Score (ESS) in minimally symptomatic patients although there was no change in cardiovascular risk. However, patients with significant co-morbidities and objective evidence of severe OSA are often treated. The treatment compliance of patients with a normal ESS is not well established. We reviewed compliance with CPAP therapy in patients with OSA with an ESS <10 who were started on treatment due to a variety of indications.

Methods Review of CPAP compliance on the Sleep medicine database in patients diagnosed with OSA and ESS <10 from July 2008 to December 2009.

Results 86 patients with OSA and ESS <10 were started on CPAP. Indications for CPAP included daytime somnolence, morning headache, distressing apnoeic events, diabetes mellitus with complications, significant ischaemic heart disease, cerebrovascular accidents, COPD and renal failure. 33 patients (38%) had mild OSA, 33 (38%) had moderate OSA and 20 (24%) had severe OSA. The mean ESS in the mild, moderate and severe groups were 6.3, 5.4 and 5.5 respectively.27 patients (31%) were noncompliant. In this group, CPAP was withdrawn at 2 weeks in 23 patients and at 3 months in four patients. 59 patients (69%) continued to be on treatment and have had symptomatic improvement. Mean ESS in the compliant group decreased from 5.7±2.6 to 1.3±1.8 (p<0.001) post treatment. 45 (76%) of the compliant patients had an average daily CPAP usage >4 h with a mean ESS change from 5.5 to 1.1. 14 (24%) patients using CPAP <4 h found symptomatic improvement with a mean ESS change from 6.3 to 2.0. Overall in the compliant group, the mean Oxygen Desaturation Index and Apnoea Hypopnoea Index decreased by 71% and 76% respectively.

Conclusion Over two-third of patients with low ESS and symptoms/significant co-morbidities were compliant with CPAP therapy. All patients had improvement in ESS on treatment. A trial of treatment in this group of patients with a low ESS appears to be worthwhile.

P23 500 CONSECUTIVE REFERRALS TO A DGH SLEEP SERVICE: HOW USEFUL IS THE EPWORTH?

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Introduction and Objectives Our sleep service offers assessment and treatment of sleep-disordered breathing (SDB). Our commissioners suggested that patients with an Epworth Sleepiness Score (ESS) = 9 did not require assessment. We assessed the characteristics of patients referred and usefulness of baseline ESS. All patients referred for assessment of SDB were entered onto a database prospectively from October 2009 to June 2011. Baseline data recorded was: referral source, demographics, ESS, sleep study type, oxygen desaturation index >4% (ODI), study interpretation, treatment decision.

Results 500 patients were referred, most commonly by GP (n=349), endocrinology (n=50), respiratory (n=34) and ENT (n=29). 365 patients were male, mean age (±SD) 51.3±13.5 years. 476 patients

(95.2%) underwent respiratory polygraphy (377 inpatient, 99 at home) and 24 (4.8%) overnight oximetry. Initial mean ESS (±SD) was 13.3±6.0 and was positive (=10) in 354 patients (70.8%). SDB was demonstrated in 309 patients (61.8%) and periodic limb movements in 8. Positivity rates varied with referral source (GP—64.8%, diabetes—55.2%, respiratory—67.6%, ENT — 55.2%) and sleep study type (inpatient polygraphy-60.2%, home polygraphy-76.8%, oximetry-58.3%). Diagnosis was obstructive sleep apnoea (OSA) (n=246, 15 with coexistent hypoventilation), upper airways resistance (n=56), obesity hypoventilation (n=4), central sleep apnoea (n=2) and COPD-related nocturnal hypoxia (n=1). Median ODI for all studies was 9 (range 0—150). OSA was mild in 72 patients (29.3%), moderate in 65 (26.4%) and severe in 106 (43.1%). ODI was <5 in 3 patients (1.2%) but the study deemed positive. Following clinical assessment, 269 patients (53.8%) commenced CPAP, of whom 36 (13.4%) had an initial ESS=9. In these patients, severity of SDB did not relate to baseline ESS (mean ODI 32.0 (ESS=9) vs 30.5 ESS=10)). Of the 106/500 patients with ESS=9, 54.3% had a positive study and 33.3% were commenced on CPAP, as compared to 65.5% and 58.8% respectively of patients with ESS=10.

Conclusion We identified a reasonable percentage of patients referred with suspected SDB. A significant number of such patients had a normal ESS, which may underestimate symptoms warranting CPAP. A negative ESS should not preclude sleep referral and should be used with caution when designing referral criteria.

P24 PREVALENCE OF OBSTRUCTIVE SLEEP APNOEA IN PATIENTS SCHEDULED FOR BARIATRIC SURGERY AND VALIDATION OF THE STOP-BANG QUESTIONNAIRE AS A SCREENING TOOL

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Background Obstructive Sleep Apnoea (OSA) is common in morbidly obese patients scheduled for bariatric surgery, and many sleep centres perform routine preoperative sleep studies for all. However a significant proportion will not have significant OSA. Epworth Sleepiness Score (ESS) is unreliable in predicting the risk of OSA. A practical screening tool is ideally required. We aimed to define the prevalence of OSA in our bariatric patient population and validate the STOP-BANG questionnaire as a screening tool.

Methods Retrospective review of bariatric patients who had sleep studies over a 3-month period from January to March 2011. Clinical data collected from medical notes and sleep study results. STOP-BANG scores derived retrospectively from clinical data. Questionnaire included 8 yes/no questions, scored 1 for every yes answer (Abstract P24 table 1). A score of 4 or more was considered as high risk for having OSA. STOP-BANG scores were then correlated with sleep study results. Significant OSA (which may require treatment with preoperative CPAP) was defined as a Apnoea-Hypopnoea Index (AHI) of at least >15.

Abstract P24 Table 1 Stop-bang questionnaire (Score 1 for every Yes answer)

Do you snore loudly to be heard behind closed doors?	Yes/No
Do you feel tired, fatigued, or sleepy during daytime?	Yes/No
Has anyone observed you stop breathing during sleep?	Yes/No
Do you have or are you being treated for high blood pressure?	Yes/No
BMI >35 kg/m^2?	Yes
Neck circumference >40 cm	Yes/No
Gender Male?	Yes/No
If Score 4 or more = high risk of OSA	
If Score 3 or less = low risk of OSA	

Results Patient characteristics (n=61): mean age 45 (24—69), 87.3% female, mean BMI 46.2 (35—67), mean ESS 6.5 (0—20). Sleep study results — 18% had AHI 15—30, 13.1% had AHI >30. 55.7% had STOP-BANG score of = 4, 44.3% had score of = 3. Of patients with significant OSA (AHI>15): mean BMI 47.2, mean neck circumference 41.4 (SD 2.5), Mean ESS 8.5 (SD 4.84), 66.6% had ESS <11, 89.4% were loud snorers. Using STOP-BANG score of = 4 to screen for OSA with AHI >15—Sensitivity 94.7%, Specificity 61%, positive predictive value 52.9%, negative predictive value 96.2%.

Conclusions 31% of patient population studied had at least moderate OSA. ESS poorly predictive of risk of OSA. Using a high risk STOP-BANG score of 4 had a high sensitivity but poor specificity. However, a low risk score of <4 had a high negative predictive value of 96.2% for AHI >15. Therefore STOP-BANG questionnaire using a cut-off risk score of 4 can be used as a screening tool to rule out significant OSA and thus avoiding sleep studies in a significant proportion of low risk patients.

P25 A NOVEL COST-SAVING APPROACH TO THE SLEEP CLINIC NON-ATTENDERS WITH CPAP MACHINES

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Introduction Increasing numbers of patients are diagnosed with Obstructive Sleep Apnoea Syndrome (OSAS) and require Continual Positive Airway Pressure (CPAP) treatment. There is little work following up patients who have received CPAP machines and then default from outpatient review. Contacting these patients may allow their care to be optimised and reclaiming unused machines may enable cost-savings in terms of reuse. Our objective was to establish if Sleep Clinic non-attenders were still using their CPAP machines, and whether a potential cost-saving was achievable from reclamation of CPAP machines.

Methods A search was performed on the Sleep Service CPAP database for patients with OSAS who had defaulted from follow-up for at least 3 years. Administration staff performed phone-based interviews based on a simple proforma, which established the status of patients' CPAP use—active, usage with problems, or no longer using. Sleep Service physiologists contacted the patients having problems with CPAP, to troubleshoot and arrange appointments for review and machine servicing. Arrangements were made for unused CPAP machines to be returned. A cost analysis was based on cost of a CPAP unit and the overtime cost of the administration staff involved in contacting patients.

Results We identified 196 patients who had CPAP machines and had defaulted from follow-up for 3 years or more. Of these, 138 (70%) patients stated they wished to continue CPAP treatment and required out-patient review. There were 58 (30%) patients no longer using CPAP and wanted to discontinue; they were asked to return their CPAP machine or be invoiced. Machines in good condition could be re-used for other patients. Based on unit cost, this could represent savings of up to £10 400. Administration overtime staff costs for this project were £386 (44 h work) and therefore the overall potential cost-saving was £10 014.

Conclusions An active search and contact of non-attenders to Sleep Clinic prescribed CPAP has identified a significant proportion no longer using their CPAP machines. The cost of this search was relatively low and thus cost-savings could be achieved in terms of reclaiming and reusing machines. This may represent an important cost-saving exercise as Sleep services continue to expand.