

Retrospective adherence data was collected from patients prior to remote monitoring.

**Results** Post establishment, initial data (3 patients) showed variable overnight adherence with mean use 38 minutes, 47 minutes and 7 hours 26 minutes respectively. Following the first phone contact with the parents, a personalized plan was agreed and arranged. The aim of each plan addressed issues such as adjusting/changing the mask interface, humidification and parental encouragement. Further scheduled contacts will occur on a personalized basis. Parents will receive a satisfaction questionnaire at the end of the monitoring period.

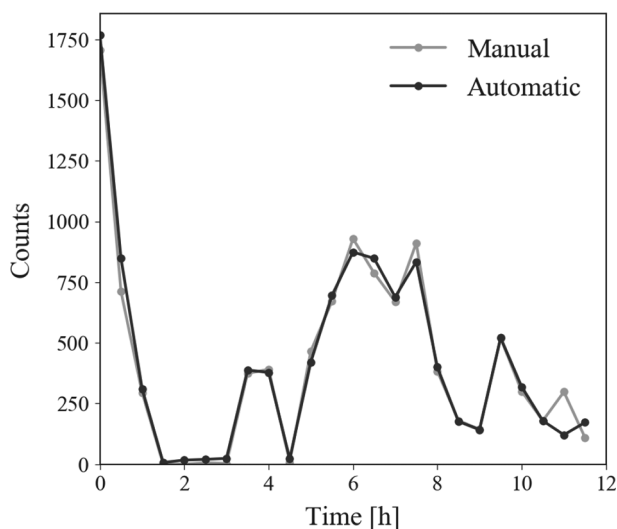
**Discussion** Remote monitoring technology has the potential to guide adjustments in NIPAPT therapy, monitor and improve adherence and reduce financial burden of hospital based review. Our preliminary work shows high uptake. We await results of the patient satisfaction questionnaire and cost breakdown following pilot study completion.

#### P034 A NOVEL APPROACH TO QUANTIFY SLEEP-RELATED RHYTHMIC MOVEMENT DISORDER USING AUTOMATIC 3D ANALYSIS

<sup>1</sup>Marcus Gall, <sup>2</sup>Rachel van Sluijs, <sup>2</sup>Elizabeth Wilhelm, <sup>1</sup>Heinrich Garn, <sup>3</sup>Peter Achermann, <sup>4</sup>Cathy Hill\*. <sup>1</sup>Sensing and Vision Solutions, Austrian Institute of Technology GmbH, Austria; <sup>2</sup>ETH, Switzerland; <sup>3</sup>Zurich Center for inter-disciplinary Sleep Research, University of Zurich, Switzerland; <sup>4</sup>School of Clinical and Experimental Sciences, Faculty of Medicine, University of Southampton, UK

10.1136/bmjresp-2019-bssconf.34

**Background** Unlike other episodic sleep disorders, there are no agreed severity indices for sleep-related rhythmic movement disorder (RMD). Rhythmic movements (RMs) can be characterized by polysomnography, but sensor placement may inhibit movements. Actigraphy and 2D video can be used in the home, but have limitations. Actigraphy does not differentiate RMs from other movements, while manual scoring of 2D video is laborious.



**Abstract P034 Figure 1** RM time of night distribution plot. Each data point shows how many 1.5 s segments are classified as RMs per 30 minutes, combining data across subjects. Automatic 3D analysis and manual 2D annotations show high agreement

We developed a sensitive method to detect and quantify RMs using automatic 3D video analysis.

**Method** Children with RMD (n=6, 4 male) aged 5–14 years were studied for two nights in a sleep laboratory. A ceiling-mounted camera captured 3D depth images, while another recorded 2D video, from lights off until lights on. We developed algorithms to analyze the characteristics of RMs and built a classifier to distinguish rhythmic from non-rhythmic movements based on 3D video data alone. Data from 3D automated analysis were compared to manual 2D video annotations in 1.5s segments to assess algorithm performance [figure 1]. Novel indices were developed: the RM index, frequency index and duration index to better characterize RMD severity.

**Result** Automatic 3D analysis demonstrated high levels of agreement with the manual approach (Cohen's Kappa >0.9; F1-score >0.9). We also demonstrated how RM assessment can be improved using plots of our novel indices for ease of visualization.

**Conclusion** 3D video technology is widely available and can be integrated into sleep laboratories. Our automatic 3D video analysis algorithm yields reliable quantitative measurement of RMs, reducing the burden of manual scoring. Furthermore, our novel RMD severity indices offer standardized measures of utility to clinical and research practice.

#### P035 THE UTILISATION OF A REMOTE MONITORING SYSTEM FOR THE IMPROVEMENT OF PATIENT CPAP COMPLIANCE

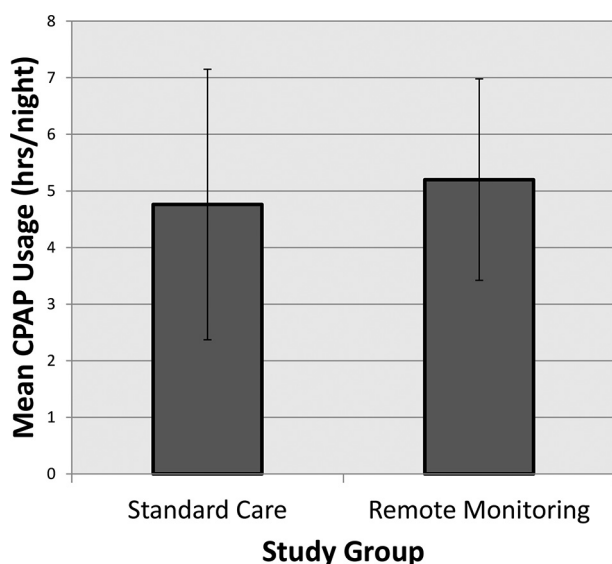
Lisa McIntyre\*. NHS Lothian, Edinburgh, UK

10.1136/bmjresp-2019-bssconf.35

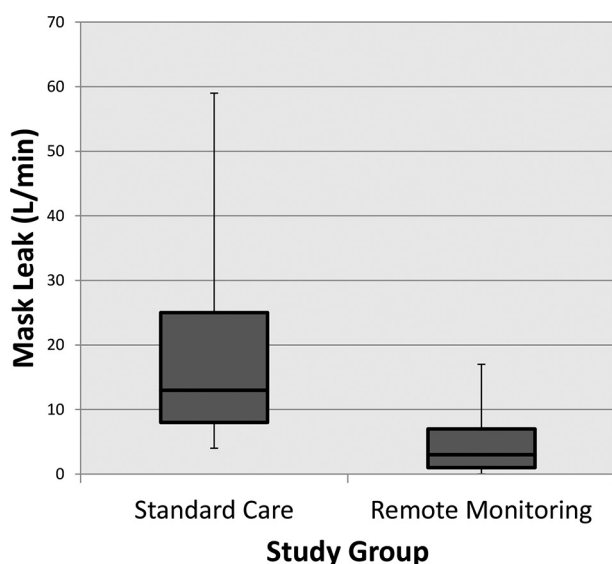
**Introduction** First-line treatment for obstructive sleep apnoea hypopnoea syndrome (OSAHS) is continuous positive airway pressure (CPAP). Compliance with CPAP is essential for treatment to be effective. Excess air leakage from the CPAP mask can be uncomfortable for patients and is an important independent predictor of CPAP compliance. As the incidence of OSAHS is rising, novel treatment pathways must be utilised to maintain service standards whilst also maximising CPAP usage. The aim of this study was to determine whether a novel remote monitoring pathway could decrease excess CPAP mask leak and increase usage of the CPAP machine.

**Methods** Patients (n=48) started on CPAP were allocated to receive either Standard Care (SC) (n=22) or Remote Monitoring (RM) (n=26) follow-up according to their appointment time. Nurses consulted software (AirviewTM; Resmed Ltd) three times per week to review RM patients and contacted them if required. Additional contact could be initiated by patients from either group at any time. Patients were followed-up 4–6 weeks after CPAP issue; SC patients were reviewed in hospital, whilst RM patients were reviewed by telephone. Data was collected on median mask leak (L/min) and mean compliance (hrs/night).

**Results** There was no significant difference in compliance between SC (4.76±2.39 hrs) and RM (5.20±1.78 hrs) groups (p=0.486) (figure 1). There was a significant difference in mask leak between SC (13(8–25) L/min) and RM (3(1–7) L/min) groups (p<0.001) (figure 2).



Abstract P035 Figure 1 CPAP Usage



Abstract P035 Figure 2 Excess mask leak

**Discussion** A novel remote monitoring system implemented within NHS Lothian did not significantly increase patient CPAP compliance. Excess leak from the mask was significantly reduced however, suggesting that compliance may be affected in a study inclusive of a greater number of patients and over a greater period of time. Therefore, more highly powered studies are required to determine if remote monitoring in the treatment of OSAHS patients can help to improve patient compliance.

#### P036 DESIGN AND DEVELOPMENT OF AN INNOVATIVE NECK STABILISING AID FOR CHILDREN WITH NARCOLEPSY

<sup>1</sup>Gemma Wheeler, <sup>2</sup>Lowri Thomas, <sup>3</sup>Nathaniel Mills, <sup>1</sup>Joseph Langley, <sup>2</sup>Heather Elphick\*. <sup>1</sup>Sheffield Hallam University Lab4Living, Sheffield, UK; <sup>2</sup>Sheffield Children's NHS Foundation Trust, Sheffield, UK; <sup>3</sup>Children and Young People's MedTech Co-operative, Sheffield, UK

10.1136/bmjresp-2019-bssconf.36

**Introduction** Narcolepsy is a disabling neurological sleep disorder characterised by excessive daytime sleepiness and attacks of muscle weakness precipitated by strong emotions, known as cataplexy. A previous exploratory technology workshop with children from the Sheffield Children's Hospital narcolepsy clinic identified 'Head and neck support in the car' as their most important unmet need in terms of aids to daily living (32/39 participants). There is currently no suitable car seat or effective support on the market for these children. Therefore, this project aimed to design, develop and evaluate concepts for a neck stabilising aid for children with narcolepsy.

**Methods** Detailed 'needs capture' through a co-design workshop with children with narcolepsy and their parents to map and discuss their travel experiences resulted in an initial specification list. A second creative workshop for idea generation using existing products and early design concepts informed further development.

**Results** A detailed design specification list has been produced. Seven concept designs have been developed for further evaluation and selection at an upcoming 'dragon's den'-style workshop. Concepts will not reach prototype stage within the scope of the project so worksheets and interactive design activities will be used to capture early subjective user opinions.

**Discussion** The use of creative, co-design methods have proven effective in capturing the voices of children and families to ensure the project is generating meaningful solutions to the core issues in this area. The project is currently ongoing with a number of possible concepts being proposed and evaluated by children and families. The preliminary concepts and supporting evaluation data will be used to apply for future funding to develop the chosen concept to prototype level and beyond.

#### P037 BRIDGING THE GAP BETWEEN PATIENTS AND PATIENT-SUPPORT ORGANISATIONS: FOR PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA

<sup>1</sup>Sulaiman S Alsaif\*, <sup>2</sup>Chris Rogers, <sup>1,3</sup>Mary Morrell J, <sup>4</sup>Annabel H Nickol, <sup>1,3</sup>Julia L Kelly. <sup>1</sup>National Heart and Lung Institute, Imperial College London, London, UK; <sup>2</sup>The Sleep Apnoea Trust Association, Chinnor, UK; <sup>3</sup>Clinical and Academic Unit of Sleep and Breathing, Royal Brompton Hospital, London, UK; <sup>4</sup>Oxford Centre for Respiratory Medicine, Oxford University Hospitals NHS Foundation Trust, Oxford, UK

10.1136/bmjresp-2019-bssconf.37

**Introduction** Patient organisations play a key role in providing patient support, whilst facilitating patient-centred and participatory medicine. The Sleep Apnoea Trust Association (SATA) commissioned a patient review of their website. The objectives of this project were to improve communication between SATA, their members and other patients with Obstructive Sleep Apnoea (OSA), and to invite members' critique of SATA's website.

**Methods** A mixed-methods questionnaire of 15-items including Likert scales, multiple-choice, open-ended, and demographic questions was designed to assess members' needs and preferences for healthcare communication. The web-based questionnaire was informed by patients, their families and clinicians, and included a structured evaluation of website accessibility, readability, and information quality. 1,318 SATA members were invited by email to participate anonymously. Descriptive