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Inspire

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FIRST WORD

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Hello again to the 'Conference Special' issue of 'Inspire'. This is usually a nice issue to put together, what with plenty of content, choosing the best photographs and having a chance to re-read some of excellent abstracts that were presented there. This year we have allocated one page to each abstract for improved ease of reading.

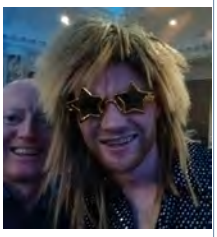
What a conference it was—just around the corner from my workplace but each session was so rewarding that I resisted the temptation to pop back to work. The session from astronaut Helen Sharman stood out for me. Helen sounded like a regular person but as she outlined the battery of tests she had to undergo to win her place against thousands of others then one realised she was anything but. Another highlight for me was Prof. Hughes' recap of respiratory physiology history and yes I do now possess a signed copy of his book.

A fine debut 'On the Blower', from Tom, is dominated by the conference exhibition and there are hyperlinks to each of the company websites should you wish to find out more about a product. Thank you to Tracey for providing the minutes of the Annual General Meeting, also held at conference, which outline the many achievements made in 2015, reports from each committee, the objectives for 2016 and of course the many benefits that come with ARTP membership.

You can read more about what has been achieved, changes in personnel and plans for the future, including an exciting new conference venue for next year, in the Chair's address. It is all getting very adventurous. A good time perhaps to think about applying for an ARTP conference grant, as the author of this article did for London 2016. Karl has also included a stop press announcement about the Respiratory and Sleep Unit at the University Hospitals of Coventry and Warwickshire NHS Trust achieving IQIPS accreditation and you can read the official announcement, from our President here. Congratulations to Jo Shakespeare and team—I know this is a great deal of work and hopefully will encourage other departments to attempt the same.

In the previous '40th anniversary' issue of 'Inspire', earlier ARTP Chairs referred to the 'ARTP family' and I was very pleased to receive contact from a previous ARTP Editor; yes before 'Inspire', yes, even before 'Breath'. You can read Duncan Hutchinson's piece on Page 8 and for nostalgia-lovers there is a copy of a newsletter editorial from the archive. It is also possible that Duncan still possesses some earlier issues of 'Breath' and this is a good time to acknowledge the great work that Keith Butterfield is doing in compiling an archive of previous issues—if you are a member they can be accessed from here.

Finally, you may have noticed a little more colour than usual in this issue. I am claiming this is in homage to the conference 70s night but of course let Paul or I know if you have any comments about the design, the content or of anything else you would like to read in your ARTP journal. inspire@artp.org.uk



Aidan Laverty
Paul Burns

A WORD FROM THE CHAIR

Dr. Karl Sylvester

ARTP Honorary Chair

Welcome to the post-conference edition of **Inspire** and my *Chair's word*. At the 40th anniversary conference we were proud to be able to host this in the capital with an excellent line-up of scientific experts, fabulous attendance from our manufacturers, outstanding research presentations plus an engaging and enthusiastic audience. The conference began with an amazing journey into space with Helen Sharman and I was so pleased that she was able to stay for a while, answer more questions and have more selfies than you can shake a selfie stick at. The entertainment for both nights was brilliant and the gala dinner room was fabulously dressed. Very many thanks to Alice and all the EBS team for outstanding organisation and for dealing with any matters in a timely and professional manner. Read further through **Inspire** for more on this year's conference.

Sadly, the conference was also a time to say farewell to a number of people leaving top positions within the ARTP. Dr Brendan Cooper stood down as President to take on his new role as President of the **Academy of Healthcare Science**. I can't believe that any of you would not know who Brendan is, or the fantastic work he has done on behalf of ARTP and its members. He has been instrumental in moulding ARTP into the professional, well-respected organisation that it is today. I know that Brendan will continue to support the ARTP as we develop further and I wish him every success in his new role. It will be no mean feat to unify all corners of healthcare science but if anyone can do it, Brendan can. We also saw Alan Moore leave the role of Events Chair which he has ably undertaken for as long as I can remember. Many a brilliant conference has been produced thanks to the hard work and dedication with Alan at the helm. Thankfully we will not be losing Alan completely, he will be offering support to the new Chair. Others moving on include Kylie Russo and Laurie Smith, who jointly led the Paediatric committee from its inception at the 2013 conference to today. They have worked hard to put Paediatrics on the ARTP map and I can safely say they have succeeded in their goals. Nigel Clayton stood down as Manufacturer's Liaison Committee (MLC) lead. Nigel has done a fantastic job in this role over the years, trying to escape on numerous occasions but we've always managed to drag him back. Unfortunately this time he got away for good.

As always, great people departing leaves the way for others to follow. I am delighted to announce the return of Martyn Bucknall who has come back as ARTP President. Martyn was a remarkable ARTP Chair who did much to attract new members. He has been a hard act to follow and I know he will be

working tirelessly as President to further highlight the ARTP profile and the work you all do as ARTP members. Kelly Pauley steps up from Vice-Chair to Chair of Events. Kelly has already been doing an amazing job in organising ARTP future events, including the next ARTP conference, more to come on that later and she will be ably assisted by Laura Jess as Events Vice-Chair (who also holds the position of Event Organiser for ARTP Scotland). Kelly and Laura, with the support of EBS, promises to be the dream team in ARTP Events. Watch out for some remarkable events coming soon. Taking on the role of Paediatric Committee Chair is Paul Burns. Now, he must be good as he's taking on a job that previously required two people! Tom Kelly has taken over from Nigel Clayton as MLC lead, ably assisted by Matthew Rutter who takes on the deputy MLC role.

So, the future and, as mentioned above, Kelly has taken the lead on organising what promises to be a ground-breaking ARTP conference. In our aim to be as inclusive to the whole of the UK as possible we are taking the next conference to Northern Ireland. The venue will be the **Europa Hotel** in the centre of Belfast. This is a beautiful venue in a beautiful city. With the help of Visit Belfast (http://visitbelfast.com/), Kelly, EBS and the ARTP Board are ensuring the scientific, educational and social aspects to this conference will be second to none. For those who may have concerns about cost and logistics, I can say it will be just as easy, if not easier, to reach the ARTP Conference in Belfast as it has been for any previous conference. There are daily flights to Belfast from many UK airports with costs comparable to previous destinations. Nothing should stop you attending this conference and with this in mind registration will be opening earlier than usual. A scientific programme is well under development and the social events we have planned will blow your socks off….sorry, probably not a good analogy given the Europa was the most bombed hotel in Europe. That's actually something the hotel displays with pride by the way! The hospitality you can expect from the Northern Irish will be second to none. As mentioned, **Visit Belfast** have been so accommodating to ARTP. They plan to organise volunteers at the airports to guide you to the venue and have many other suggestions, which we are considering. Keep an eye on social media for announcements.

One other announcement is extremely worthy of repeated mention. A massive congratulations to Jo Shakespeare and her team at the Respiratory and Sleep Unit at the University Hospitals of Coventry and Warwickshire NHS Trust. They are the first respiratory and sleep department to receive IQIPS accreditation via the accrediting body United Kingdom Accreditation Service. This recognises the service quality, care and safety and compliance to the standard benchmarks as set out by IQIPS. As an organisation, ARTP stands for quality in respiratory and sleep investigations and Jo and her team exemplify everything that ARTP stands for. It is no mean feat to obtain IQIPS accreditation. It requires a lot of dedication and preparation. Please read further through Inspire for more about this truly inspiring story and one that every respiratory and sleep department around the country should be striving for.

Enjoy this next edition. It promises to be filled with lots of useful information, scientific content, feedback and much, much more. Until next time.

IQIPS Accreditation – Improving Quality in Physiological Services

ARTP are delighted to announce that the Respiratory and Sleep Unit at the University Hospitals of Coventry and Warwickshire NHS Trust has successfully been awarded IQIPS Accreditation following comprehensive review of its services and facilities by the accrediting body **UKAS**.

The assessment involved a comprehensive review of all policies and procedures including a 2 day visit by the inspection team comprising assessment managers, technical/professional assessors and patient /lay representation.

The service becomes the first Respiratory/Sleep service to receive this prestigious recognition for service quality, care and safety and compliance to the standards benchmarks. It recognises the high quality care that the service offers to its patients and its commitment to continually review and improve the services offered to patients with respiratory and sleep disorders.

The department successfully met all of the 26 IQIPS standards, including areas of exceptional practice across the following 4 domains:

- Patient Experience
- Safety
- Facilities, Resources and Workforce
- Clinical

Service Manager Joanna Shakespeare said *"As a department we are really proud to be the first respiratory and sleep department to complete the IQIPs accreditation process. Every member of the team has actively contributed to the process and we have seen the improvements that it has made to our service. Prior to starting the accreditation process we felt that we were providing a good service to our patients however by undertaking self-assessment and accreditation we identified gaps in our policies and procedures that we were unaware of. Our service is much more patient focused as a result of this process. We recognise that we continually need to assess and modify our service to continue to improve and the IQIPs accreditation process will facilitate this. It hasn't been easy and a lot of time and effort has gone into completing the process however I can honestly say that it has been worth it for the obvious improvements that it has brought. I would like to acknowledge the support of the whole team, physiologists, scientists, nurses and administrative staff, as without their support it would not have been possible. In addition the support of the senior management team and clinical director has been vital to us successfully completing the process"*

ARTP would like to acknowledge and congratulate Joanna and her team on this excellent achievement and look forward to more services now working towards accreditation. For more information and to get involved with the IQIPS programme, please visit www.iqips.org.uk.

Yours Faithfully,
Martyn Bucknall
ARTP President

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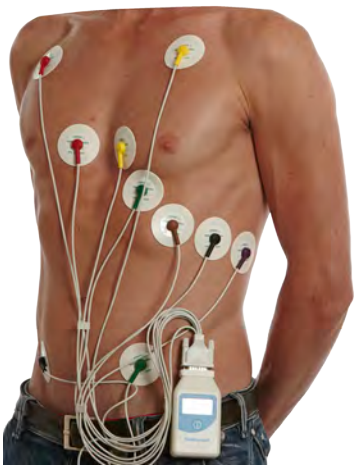

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A view from the woodwork

Duncan Hutchison

editor of the ARTP Newsletter and Breath from 1976 to 1993

As I crawled out of the woodwork one winter morning, my eyes were quite dazzled by the **40th** Anniversary number of **Inspire**. It was good to read the articles from so many of the chairpersons down the ages, recording all the successes of the Association. This all brought back for me a lot of memories from earlier days, so I went to my ARTP files (fairly complete if somewhat dusty) and thus to the early issues of the Association journal. (I should just add that after my 'official' retirement some years ago, I moved away from the field of COPD, lung function etc. and concentrated largely on tuberculosis).

The formation of the **ARTP** was originally stimulated by the appearance of the Report of the Committee on Hospital Scientific and Technical Services, better known as the Zuckerman Report. This was named after Solly (Lord) Zuckerman (1904 – 1993) a very distinguished figure of the time. He was an FRS, had been Professor of Anatomy at Birmingham University and was chief scientific adviser to the Government from 1964 to 1971, though had been retired for some time when the Report came to be implemented.

One of the main proposals of the Report was the merger of Physics, Bioengineering and Clinical Physiology Departments. **Len Smith**, who became our first chairman, saw immediately that this was quite impractical and he then set about the formation of the **ARTP**, recommending that we join the FAMT as soon as possible. More details about the goings-on in that era can be found in some entertaining articles written at the time:

- *Newsletter No 2 (Oct 1976). Len Smith - The good old days. (Ed. Reproduced here)*
- *Newsletter No 3 (Jan 1977). Jim Reed and Len Smith - Up the Elephant.*

After the formation of the **ARTP**, I found myself editing the Association Newsletter with **Spike Clay** of the MRC Pneumoconiosis Unit, Penarth. Spike designed our nice logo which of course is still in use today, though I have noticed the interesting modification now used in connection with sleep studies.

The formation of the ARTP was originally stimulated by the appearance of the Report of the Committee on Hospital Scientific and Technical Services, better known as the Zuckerman Report.

The first five issues (Sept 1976 to Sept 1977) were produced in a simple typed format but for the 6th issue (Dec 1977) the Association decided that it should have a rather more professional appearance, with the jollier title of *'Breath'*.

Issues from 10 onwards were edited with **Janie Jones** of the London Chest Hospital. Janie provided the required technical equipment which at that time consisted of a large pair of scissors and a pot of glue, with which we cut and pasted up the proofs received from the printer. I got the hang of this after a while, though I suppose things have moved on a bit since then. After 1989 Janie handed these responsibilities on to **Adrian Kendrick** in Bristol. Our last issue as Breath (No 42) was in 1993, and the journal then continued with the new name 'Inspire' at first under the editorship of **Sue Revill** and then under successive editors until it has grown into the fine journal that we now see – though I still have a tiny bit of nostalgia for ***'Breath'*** as the title.

One of the duties of an editor is to write editorials and you have kindly quoted one of my literary efforts. *The National Fag* appeared in Breath No 12 (Feb 1981), just 35 years ago. The opening paragraphs are still just as relevant today but there are many new and important issues to be considered, such as the effects of restrictions on advertising, packaging, passive smoking and smoking inside public buildings. But the most significant change has perhaps been the introduction of e-cigarettes and this has been well reviewed by **Kimberley Lewis** (Hot Topic, Inspire Vol 16 issue 2 Aug 2015) who points out that a large number of e-smokers still smoke conventional cigarettes, making nonsense of the original hope that patients would simply use them as a cure for the smoking habit and stop when that had been achieved. Even if used alone, the possibility of significant long term harmful effects cannot be ignored, though I imagine that these must be far less severe than those of tobacco smoking itself.

the required technical equipment which at that time consisted of a large pair of scissors and a pot of glue

Another topic of interest was the standardisation of lung function tests and at some point in the early nineties, I found myself chairing a working party on this subject where we felt that an update was seriously overdue. Regrettably I don't have a record of the committee members apart from Adrian and Sue Revill who was the thoroughly efficient secretary. Our efforts were published as (hopefully still cited) :

Standardisation of lung function tests; a practical guide for technicians. Respiratory Medicine 1994;309:165-94

(Ed. the 1994 guidelines are still the current UK but ARTP are currently working on updating them)

One of my hobby horses was the correct assessment of bronchodilator response in emphysema. We showed at King's some time ago that the slow or relaxed VC was a much more reliable measure than FEV_1. This view has not always been accepted but for those who collect historical documents, the original evidence can be found in:

Bellamy D, Hutchison DCS. The effects of salbutamol metered dose aerosol on lung function in pulmonary emphysema. Brit J Dis Chest 1981;75:190-6

Congratulations to everybody for all your achievements and looking forward to the 50th Anniversary. Be there!

ARTP CONFERENCE GRANT WINNER

Non-attendance at CPAP follow up clinics for patients with Obstructive Sleep Apnoea

Amy Hall, Derby Teaching Hospitals, NHS Foundation Trust

INTRODUCTION

Non-attendance at scheduled healthcare appointments has a huge financial impact on the NHS. Missed appointments result in decreased productivity due to the inefficient running of clinics and under-utilisation of resources, as well as a reduction in the number of appointments available for all patients and therefore increased waiting times due to a mismatch between demand and capacity. In addition, non-attendance in the Obstructive Sleep Apnoea (OSA) population results in a lack of monitoring as patients' compliance with CPAP and the effectiveness of therapy cannot be established and maximised.

Analysis of Derby Teaching Hospitals NHS Foundation Trust attendance data for the year 2014 reveals a high non-attendance rate at CPAP follow up clinics. Patients established on CPAP therapy are required to attend the clinic for review annually. However there is inadequate monitoring in a significant number of patients who fail to attend their scheduled appointment, potentially resulting in a proportion of patients living with untreated OSA. Patients in whom CPAP therapy is not optimised are pre-disposed to further health-related complications and worse quality of life, as untreated OSA is associated with increased risk of fatal and non-fatal cardiovascular events (Marin et al, 2005). This study aimed to investigate factors that influence the non-attendance of patients with OSA at CPAP follow up clinics.

METHODS

Study Population

A retrospective study conducted over a two month period in CPAP follow up clinics at the Royal Derby Hospital. It involved adult patients with a diagnosis of sleep-disordered breathing, predominantly OSA, who were being treated with CPAP therapy. The patients were scheduled to attend for routine follow up during October 2014 or November 2014. All patients included in the analysis had been using CPAP therapy for a minimum of six months. Patients who cancelled or rearranged their appointment ahead of the scheduled date and time were excluded from the analysis .

Data Collection Procedures

261 patients were eligible for inclusion in the Study. Patients were categorised into one of

two groups: 'Attenders' or 'Non-attenders'. 'Attenders' were defined as those patients who arrived for their scheduled appointment. 'Non -attenders' were defined as those patients who did not arrive for their scheduled appointment without giving prior notice. The following variables were reviewed: age; gender; disease severity at diagnosis; compliance with CPAP therapy at the last visit; length of time on CPAP therapy; and the number of previous missed appointments.

Data Analysis

Descriptive statistics and 95% confidence intervals (CI) were calculated for all variables. Comparisons between groups for continuous variables were performed using an independent t-test. Comparisons between groups for categorical variables were performed using a Pearson chi-square test. All variables that achieved significance in the univariate analyses were entered into logistic regression analysis, with non-attendance as the dependent variable. Odds ratios and 95% CI were computed for all independent variables. A level of $p< 0.05$ was selected to identify statistical significance for all comparisons.

RESULTS

A total of 261 patients were reviewed during the study period. Of these, 202 patients attended their scheduled appointment and 59 patients did not attend their scheduled appointment, equating to a non-attendance rate of 22.6%. Data relating to disease severity at diagnosis was not available for 69 patients. This was because diagnostic investigations were conducted prior to the installation of the clinic database currently in use, or because diagnostic investigations were conducted at another hospital. Similarly, missing data for compliance with CPAP therapy at the last visit and the length of time on CPAP therapy is a result of patients transferring to the clinic from other hospitals

The univariate association between patient characteristics and attendance status are detailed in Table 1. Compared to attenders, non-attenders were younger, had poorer compliance with CPAP therapy at the last visit and had missed more scheduled appointments since starting CPAP therapy. The difference between attenders and non-attenders in relation to the number of previous missed appointments remained significant after adjusting for the length of time patients had been using CPAP and therefore the length of time they had been attending the clinic ($p<0.001$). Gender, disease severity at diagnosis and the length of time on CPAP therapy were not significantly associated with non-attendance.

Multivariate analysis demonstrated that younger age, a greater number of previous missed appointments and poor compliance

Table 1. Patient characteristics for attenders attenders & non-attenders

	Attenders	Non-attenders	p-value
Age	*(n = 202)*	*(n = 59)*	
mean years (95% CI)	59.2 (57.7-60.7)	50.4 (47.4-53.4)	<0.001
Gender	*(n = 202)*	*(n = 59)*	
% male (95% CI)	79.7 (74.2-85.2)	69.5 (57.8-81.2)	0.099
Previous missed appointments	*(n = 202)*	*(n = 59)*	
mean number (95% CI)	0.9 (0.7-1.1)	3.3 (2.6-4.0)	<0.001
Disease severity at diagnosis	*(n = 144)*	*(n = 48)*	
mean ODI/AHI (95% CI)	36.0 (31.5-40.5)	33.8 (26.7-40.9)	0.618
Compliance with CPAP at last visit	*(n = 197)*	*(n = 57)*	
% ≥4 hours/night (95% CI)	82.7 (77.4-88.0)	57.9 (45.1-70.7)	<0.001
Length of time on CPAP	*(n = 190)*	*(n = 56)*	
mean years (95% CI)	5.3 (4.8-5.8)	4.4 (3.6-5.2)	0.062

ODI: oxygen desaturation index, AHI: apnoea hypopnoea index

Table 2. Logistic regression analysis to examine determinants of non-

	Odds Ratio	95% CI	p-value
Age			
(years)	0.96	0.93-0.99	0.014
Previous missed appointments			
(number)	1.53	1.30-1.80	<0.001
Compliance with CPAP at last visit			
(reference is ≥4 hours/night)	2.51	1.19-5.32	0.016

with CPAP therapy (defined as usage of <4 hours/night) were all significant independent factors associated with non-attendance (Table 2).

DISCUSSION

This study demonstrated that a significant number of patients failed to attend their routine follow up appointment in the CPAP clinic. Several patient-related factors were identified as influencing non-attendance. Firstly, patients who did not attend their scheduled appointment were significantly younger than patients who did attend. One possible explanation for younger patients missing appointments is that they place less value on their health. Health problems and the development of chronic disease often accompany the ageing process, therefore patients of a younger age may view attending to health matters as a lower priority. Alternatively younger patients may be more likely not to attend their appointments due to work commitments.

The average age of attenders in this study was much closer to retirement age. Similarly, younger patients may have more family commitments than older patients, such as caring for children.

Whilst younger age as a predictor of non-attendance is attributable to the patient, the plausible explanations for these patients not attending highlight that it is the interaction of patient-related factors with health system-related factors that has the potential to create a barrier to attendance. For example, making changes to the operating hours of clinics and scheduling patients' appointments for more convenient days and times may help to negate the effect of age on non-attendance. The concept of health system-related factors being implicated in the association between age and non-attendance may also be true with regards to the way patients are notified and reminded of their appointments. At present, the CPAP clinic sends a letter to patients, approximately four weeks prior to the scheduled attendance date, as notification of the appointment. Contacting patients about their appointments using other means of communication may help to reduce the number of younger patients who fail to attend.

Another factor identified as being significantly associated with non-attendance at routine CPAP follow up was the patient's level of compliance with CPAP therapy at their last visit to the clinic. The use of CPAP for ≥4 hours/night is widely considered as acceptable compliance. Of the attenders in this study, 82.7% were using their CPAP machine for ≥4 hours/night and were therefore judged to have acceptable compliance, compared to only 57.9% of non-attenders. This is a highly significant finding on two counts. It confirms that not only does poor CPAP therapy compliance appear to influence non-attendance, but also that a substantial number of patients are likely to be living with untreated OSA. The fact that such a large proportion of patients with poor CPAP compliance failed to attend for review is of great concern, as healthcare professionals do not then have the opportunity to intervene in order to try to maximise the effectiveness of CPAP therapy.

So, why are patients who have poor compliance with CPAP therapy more likely to miss their appointment? One reason may actually relate to patients' anticipation of the consultation with the healthcare professional, in that they worry about receiving a negative reaction

and/or criticism for not achieving acceptable CPAP compliance. Snow and Fulop (2012) demonstrated in a study of diabetic patients that healthcare professionals' reaction to 'poor control' and a fear of being judged influenced attendance decisions, with patients citing a fear

of being 'told off' for poor control or for failing to reach biomedical targets as a major factor in their decision not to attend. It is also worth considering the implications of a diagnosis of OSA and the use of CPAP therapy in relation to driving. Given the excessive daytime somnolence that typically accompanies OSA, untreated OSA is a risk factor for road traffic accidents. Patients diagnosed with OSA that is associated with sufficient sleepiness to impair driving are legally obliged to inform the Driving and Vehicle Licensing Agency (DVLA) of their condition. Confirmation from a clinician that a patient is compliant with therapy and that their symptoms are controlled is required in order for them to drive legally (British Thoracic Society, 2014). As this study was conducted retrospectively the driving status of patients at the time of their scheduled appointment is unknown. However it is conceivable that sub-optimal compliance with CPAP therapy may deter patients who are drivers from attending their appointment, due to uncertainty and anxiety around DVLA requirements. Lastly, patients who did not attend their scheduled appointment during the study period had missed significantly more appointments since starting CPAP therapy than those who attended. Perhaps frequent non-attenders at CPAP follow up clinics have poor medical adherence in general and health records for these patients may in fact reveal a history of missed appointments in other clinics. Or perhaps the reason for non-attenders having missed more previous appointments can be explained by worse health and increased co-morbidity, which present a barrier to regular clinic attendance. Arguably the primary reason cited by patients for not attending scheduled appointments is forgetfulness. It therefore seems reasonable to suggest that simply forgetting to attend may explain why non-attenders have missed significantly more previous appointments. On the contrary, a poor attendance history could be associated with apathy rather than a genuine forgetfulness to attend. Whilst research examining the impact of patients' health beliefs on non-attendance is currently lacking, one study found that patients who did not attend clinic appointments were less convinced they were able to influence their health (Spikmans et al, 2003). Hence, the finding that non-attenders for routine follow up in the CPAP clinic were more likely to have a history of missing appointments may reflect a lack of motivation to attend.

CONCLUSION

Almost a quarter of patients failed to attend their appointment in the CPAP clinic. Younger age, poor compliance with CPAP therapy and a history of missing scheduled appointments were all demonstrated to increase the

likelihood of non-attendance. There is strong evidence to support the use of interventions aimed at optimising patients' compliance with CPAP therapy in order to improve clinic attendance rates. In addition, strategies to reduce potential barriers to attendance in younger patients and those with a history of missing appointments should be explored.

One of the limitations of this study is that it only allows a profile of patients more at risk of not attending appointments to be established. Without obtaining patients' views in relation to missed appointments, the reasons for non-attendance can only be inferred from the influential factors identified. Further research is required in order to establish the specific reasons for patients not attending. Future studies should also consider both patient-related factors and health system-related factors in order to gain a better understanding of their potential interaction. This will allow more effective strategies to be implemented, leading to improved attendance rates and better health outcomes.

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Tom Kelly
Matt Rutter
Alan Moore

ON THE BLOWER

This edition of 'On the blower' is dominated by our exhibition report from the recent ARTP conference, with updates from a number of companies who have sent us information on products, developments and changes to their ranges, many of which are following on from launches at conference in January.

Exhibition Roundup 2016

Thanks as always to all the companies who supported the ARTP conference this year in London. The venue was great and terrible for the exhibitors at the same time – loading and unloading was – to put it mildly – challenging, and at times it was warmer outside on the street than in the exhibition hall! Having said that, the adjacent positioning of the conference and exhibition halls, and the serving of lunch throughout the exhibition hall by the very nice hotel staff on duty, hopefully made up for the shortcomings. Our exhibitors were understanding of the difficulties caused by the late venue change, and overall, it went very well with positive feedback from the exhibitors.

Conference delegates put in a great appearance at the exhibition, and that helped a lot in making it a successful exhibition this year. That's why the companies are there, to meet with customers and potential customers, so keep up the good work next year please!

A big thank you to Alan for the photos – excellent as usual!

TK

DeVilbiss

DeVilbiss Healthcare launched the new DeVilbiss Blue range at conference. This includes the Standard Plus and Auto Plus models, with the new PulseDose Humidification system available as required. The new range offers a new level of performance over previous models, with advanced algorithms and improved sound levels.

The acquisition by Drive Medical has encouraged accelerated product development for DeVilbiss, with new products coming to market shortly. A range of new aerosol products is expected in March, with an early summer release of new pulse oximetry products to follow.

Intrapharm Laboratories Ltd.

Intrapharm Laboratories used the conference for the official launch of their new presentation of Carbocisteine. Building on the success of the liquid and capsule presentations of the mucolytic, the product is now available in sachet form.

In addition to improved ease and convenience of dose delivery, it is estimated that this presentation offers savings of 10% compared to the capsule, and 27% compared to the liquid presentations. If adopted, this has the potential to offer significant savings nationally.

Philips Respironics

Philips Respironics displayed the full range of products from the Dream Family range of sleep diagnostic and therapy equipment. These include new diagnostic systems which are complemented by new CPAP devices and a whole new range of face masks. The Alice range offers solution for domiciliary and laboratory based sleep studies.

Philips Respironics offer complete patient compliance management solutions, and demonstrations were available on the stand.

Itamar Medical

Itamar Medical displayed their WatchPAT device, and FDA-approved portable device for use in testing for obstructive sleep apnoea. The WatchPAT is worn like an overnight oximeter, but additionally provides sleep staging using peripheral arterial tone analysis algorithms. It is claimed that this proprietary technology can discriminate between stages wake/light/deep/REM sleep with an 80% correlation to PSG validation studies.

Clicking on the company name will hyperlink to their website

ON THE BLOWER

Tom Kelly
Matt Rutter
Alan Moore

Radiometer

Radiometer displayed a number of products from their blood gas testing and haematology range. The latest update to the blood gas testing range is the ABL90 FLEX Plus. Improvements to this product line include a new Micromode measurement, which has a 45 microlitre sample size requirement, and an automated inlet for improved convenience.

Radiometer had hoped to launch a new Transcutaneous monitor at conference, this will now be launched a number of months later than planned, and will bring new features to the range.

Medgraphics UK

Medgraphics displayed a full range of lung function instrumentation including the Platinum Elite plethysmograph and the Ultima product range. The Ultima range offers the opportunity to combine lung function (gas exchange) and exercise testing in a single streamlined unit, and can offer a very efficient use of testing space if room size is a problem

Medgraphics continue to invest to maintain high levels of customer satisfaction with their products and customer support.

Intermedical

Intermedical had on display a number of products from their spirometry, lung function, and sleep equipment ranges. Lung function equipment included the ndd EasyOne Pro portable lung function range offering spirometry, gas exchange and lung volume measurements in a portable package.

Intermedical used the conference to showcase the new MIR Intermedical Spirolab, a desktop spirometer with a 7" touchscreen and printer. Also on display was the Resmon Pro FOT (forced oscillation technique) system, and a range of products from their sleep diagnostics and therapeutics range.

Carefusion

Carefusion celebrated the 40th anniversary with a themed stand "working through the decades with ARTP". It was interesting to be reminded of the developments in technology we have enjoyed as respiratory physiologists over this time. We tend to take the technology for granted, but the photographs of equipment spanning 4 decades was a real reminder of how far these technologies have developed.

Carefusion displayed a full range of lung function equipment , including a body plethysmograph and metabolic cart. Also on display was the Vyntus Walk, allowing wireless communication of data during a 6-minute walk test to a tablet PC.

GDS Meditech

GDS Meditech continue to introduce innovative products in sleep and acid reflux investigation, with both diagnostic and therapeutic applications and solutions. Among these products, the AlaxoStent was on display. This is an alternative treatment option for snorers and OSA sufferers, who are unable to tolerate and/or utilise CPAP therapy. It is primarily for sufferers with soft palate issues. Also on display was the NightShift sleep positioner, which uses vibrotactile feedback to discourage supine sleep, and reduce AHI in mild to moderate OSA

Dolby Vivisol

Dolby Vivisol promoted their wide range of support services available respiratory and sleep services. The areas covered include home oxygen, CPAP, and NIV therapies. The company also delivers aerosol therapy services.

Dolby Vivisol can support patients while on holiday using their international organisation. They can support healthcare professionals using their online prescribing and patient management solutions. In addition to this wide range of support services, the company is a provider of accredited training for HCPs.

Resmed

In addition to displaying a wide range of sleep diagnostic and therapeutic equipment, including the AirSense range, Resmed's focus was in the area of connected care and patient compliance. Their fully integrated approach includes domiciliary diagnostics and sleep screening with many options available using the Air Solutions packages to assist with patient management. AirView's functionality may allow efficiency improvements in hospital services with subsequent savings to be achieved by departments offering sleep and NIV services.

Clicking on the company name will hyperlink to their website

Tom Kelly
Matt Rutter
Alan Moore

ON THE BLOWER

Fisher and Paykel

F&P announced the launch of their new ESON 2 mask at this year's conference. The original ESON mask has been successful for some time now, and F&P have concentrated on improvements primarily in terms of ergonomics to the original. The ESON 2 is offered with 20 design improvements over its predecessor.

In addition to the new mask launch, the company had on display a range of products from their CPAP equipment range, and a number of other mask types as well as the ESON 2.

Bird Healthcare

Following 27 successful years of operations in Australia, Bird Healthcare return for their second ARTP conference. Bird manufactures a wide range of consumables for the respiratory and sleep markets. On display were a range of filter mouthpieces and nose clips, suitable for use with spirometry and lung function equipment from all of the well-known manufacturers.

Bird Healthcare can customise consumable supplies to suit individual laboratory's needs, as in the supply of various filter/nose clip combinations. Bird Healthcare also manufactures a range of spacer devices.

nSpire

displayed a new branding and logo. The KoKo spirometer has been updated. Currently a standalone instrument; this will be networkable in the near future. Software and connectivity solutions are being rolled out to offer administrative and clinical data solutions to assist with departmental and institutional integration.

S-Med

S-Med displayed a number of products from their polysomnography and cardiorespiratory screening ranges, including the SOMNOtouch Resp screener, which offers 10 internal channels in a small footprint, with HD touch screen. This can be expanded by up to 8 external channels and a 10-channel headbox. The SOMNOscreen PSG was also displayed, along with a full range of sleep diagnostic accessories, and the latest version of Domino software was demonstrated.

Powerbreathe

displayed their range of therapy products including the Plus and Medical series and educational material covering principles and use. Their expectoration range was also on display. Demonstrations displayed volunteers' results and the new easy-to-use software for respiratory muscle training, providing easy viewing of trend results.

Baywater Healthcare

promoted their services that include home oxygen, sleep diagnostics, CPAP, NIV and nebuliser therapy. Their new sleep diagnostics and treatment. service builds on their remote monitoring solutions to offer fast turnover, data downloads and ongoing patient management.

Stowood Scientific

Stowood displayed a number of products from the Stowood and Embla product lines. The Visi-download software – now on the Visi-Download 2015 version - continues to link most of the well-known oximeters and screeners with its widely applicable interface.

Stowood's product range covers diagnostic testing from home screening solutions, up to PSG laboratory levels, with a full range of software options to complement the hardware solutions. Among the newest product releases is the Polywatch, a sleep screening device linking to the Visi-Download interface claimed to offer excellent value in this market.

GVS

As a filter manufacturer, GVS offer consumables to fit across the range of lung function and NIV equipment. Filter ranges include 80 different fine, ultrafine, and pollen types, including foam and polyester felt plus bacterial/viral electrostatic media.

In lung function, GVS offers filter mouthpieces, nose clips and a selection of rigid and flexible mouthpieces and bite grips.

Intus Healthcare

Intus displayed products from their sleep therapy product range, including CPAP and humidifier equipment and a wide range of CPAP mask options such as nasal, full face and specialised paediatric masks and tubing. The SleepWeaver range of CPAP masks are manufactured with a dual cushion design to help address facial variables and have a cloth, rather than the more usual silicon or gel, patient interface. Intus also showed the new Litebook Edge, a portable, rechargeable SAD light used in the treatment of circadian rhythm disorders.

Clicking on the company name will hyperlink to their website

Tom Kelly
Matt Rutter
Alan Moore

ON THE BLOWER

Vitalograph

Vitalograph distribute Medisoft and Vitalograph lung function equipment in the UK. The Medisoft range has undergone a complete rebranding, with the new corporate logos and colours on the full range of lung function equipment, including a plethysmograph, on display on the stand. Medisoft offers a full range of pulmonary testing, including TL_{NO} and F_ENO measurement.

Vitalograph recently launched the new microSpirometer, a hand-held Fleisch pneumotachograph-based device, a fully featured spirometer with a full colour touchscreen. There was also a demonstration of the latest Spirotrac and Spirotrac Fusion software.

Loewenstein Medical UK

Opened in the UK since 2014, as part of the Loewenstein group, the company offers the full range of Weinmann CPAP equipment including the new Prisma line of CPAP/APAP/NIV machines. The prismaAQUA offers an integrated humidifier. CPAP therapy products include the JoyceOne line available in full-face, nasal, and minimal contact versions plus a full accessory range.

From around the companies

S-Med have released details for a number of new products recently launched in the UK.

SOMNO HD

"We are pleased to announce the release of the new SOMNO HD, our new Polysomnography System. The SOMNO HD is a major upgrade on our popular SOMNOscreen PSG system offering up to 70 channels with sampling rates of up to 4kHz per channel. Building on the features of the lightweight and modular SOMNOscreen, the new SOMNO HD is 30% smaller and lighter than the SOMNOscreen with the unique Intelligent Connect sensors which allow sensors to be inserted in to any input in the device without having to re-initialise the device. The SOMNO HD also has a High Resolution touch-screen making it easy to view signals, perform impedance checks and bio-calibrations without having to keep returning to the acquisition station.

SOMNOtouch

The SOMNOtouch offers new features such as a multiplexer adaptor allowing connection of 2 x PLM's, ECG and a secondary Effort sensor into one auxiliary connector, freeing up the second connector for the AASM compliant EEG head box making the SOMNOtouch a powerful system whilst maintain its smallest multi-channel cardio-respiratory screener credentials.

DOMINO

Along with the new SOMNO HD, we will be introducing the latest version of the DOMINO software. New features include an upgraded version of the User Manager allowing full tracking of who performed what task within the system. Also, this can work with Microsoft Active Directory allowing IT Departments to control secure access to the Software.

DOMINO can also be installed on to the hospitals file server which allows registered users to access the software from any networked PC.

The new DOMINO software now offers the facility to analyse recordings from the SOMNO HD, SOMNOscreen and SOMNOtouch all on the same software platform".

TK

Philips Respironics have sent us an update on their newest items for their sleep diagnostic and therapy ranges.

"Philips introduces the Dream Family consisting of DreamStation CPAP device and award-winning DreamWear CPAP nasal mask.

DreamStation is designed to increase patient acceptance and adherence while improving operational efficiencies for you and your sleep clinic. Compact, low profile patient-driven design with flexible connectivity and monitoring options and algorithms to help patients adjust to and continue using therapy long-term.

DreamWear - Under the nose nasal mask. *2016 iF Gold Award: Product Design*

Designed to help patients feel like they are not wearing a mask, DreamWear's revolutionary design directs airflow through the sides of the mask frame, allowing patients the freedom to sleep how they want.

Amara View Full Face Mask - Small, light and with a wide field of vision, it's easy to wear glasses, read, watch TV, and use a computer or tablet before falling asleep.

Philips Alice NightOne home sleep testing device - Designed for ease, confidence and reliability to help patients get their study done right the first time, with features and functions designed with patients in mind

Philips remote alarm accessory for Trilogy Series and BiPAP A-Series - A battery and mains power remote alarm is now available for the Trilogy Series and BiPAP A-Series non-invasive ventilators, alerting caregivers to an alarm condition in another room with audible and LED notifications.

Philips SimplyGo Mini portable oxygen concentrator - Philips now offers a small pulse dose-only oxygen concentrator, capable of outputting 1,000 ml/min in a device weighing less than 2.5kg. Rigorously tested in real world environments, SimplyGo Mini is available in standard (4.5hr) and extended (9hrs) battery configurations, with accessories including a stylish backpack."

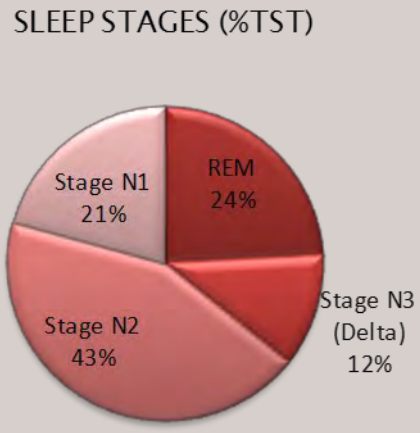
TK

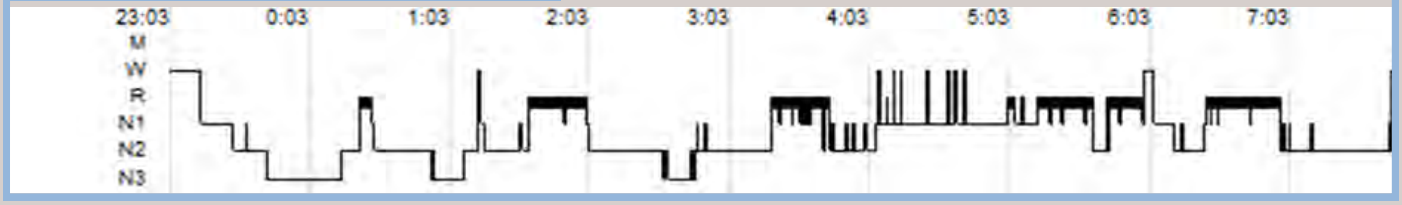
Intermedical have sent us details on developments to their Medibyte sleep range.

A new polysomnography option has been added to our Medibyte sleep range enabling it to measure one channel each of EEG, EOG and EMG. This is a software change that can be used with the current hardware. It is aimed at sleep labs who do home testing and do not currently have a lab based polysomnography system. These three channels mean that the system meets the requirements set by AASM for sleep staging. A sleep stage histogram is generated as exemplified overleaf:

Sleep Summary

Lights Out Time:	**23:03:35**
Lights On Time	**07:48:11**
Total Study Time:	**524.6**
Total Time in Bed:	**524.6**
Total Sleep Time:	**501.0**
Total Wake Time:	**23.6**
Sleep Latency:	**12.94**
Sleep Efficiency:	**95.5%**
Number of Awakenings:	**10**
Number of Stage Changes:	**121**





A paper was presented at the Italian Association of Hospital Pulmonologists last November where the effectiveness of airway clearance methods in clearing the peripheral airways was measured by the Resmon Pro FOT device. Improvement in resistance and reactance were measured following airway clearance showing the first quantitative measurement of the benefits of airway clearance.

There has been an increased interest in recent years in the measurement of lung clearance index to evaluate the homogeneity of the lung as measured by the Prolab as part of a multi-breath washout test. This parameter can be useful in diagnosis of cystic fibrosis and non-cystic fibrosis bronchiectasis. Some work has been done in measuring resistance differences at 5 and 19 (or 20) Hz. It has recently been hypothesised that reactance measured at 5 Hz maybe a better indicator of peripheral airway disease. Both parameters can be measured by the Resmon Pro.

TK

Stowood Scientific sent us product information on the new Embletta MPR PG:

- The Embletta uses the same software as your staff are already trained on
- The Embletta uses the same consumables as your staff already are trained to use
- The Embletta is sold by Stowood, who have been selling sleep diagnostics since 1992 and have been distributing Embla since 1994
- The Embletta has a sampling rate of 500 Hz, resolution of 24 bit, internal memory of 2 GB, allowing recording time of up to 24 hours, depending on the mode, channels and memory.
- The Embletta's total weight including oximeter is only 153 g
- The Embletta has an external microphone that is placed near the patients head for optimum recording of snoring sounds, not under the blanket or recording through a nasal cannula

- The Embletta is securely attached to the patient via an elastic strap, so it will not swing about when the patient moves
- The Embletta requires only one type of battery, the cheapest available on the NHS supply chain
- The Embletta has a built-in DC port, so other devices' signals can be fed in and recorded
- The Embletta has a hi-res multi-colour screen, for showing and comparing multiple channels simultaneously
- The Embletta can be upgraded to acquire full PSG by purchasing different plug-in modules if and when required- but you only need the Embletta for normal use. You don't need many different recorders!
- The Embletta can be interfaced to CPAP devices via the optional TX proxy.

Full details on the Embletta MPR PG available at www.stowood.com

TK

Drive/DeVilbiss Healthcare have released further details of corporate changes following Drive's acquisition of DeVilbiss Healthcare last year. The European subsidiaries of both companies are to integrate, and is scheduled to occur within the next 12

months. Some details from their press release follow:

"This integration is brought about largely by customer demand. Though Drive acquired DeVilbiss last year, outside of North America the two companies have operated independently until now…. …customers…. expressed strong interest in a thoroughly integrated experience with respect to product ordering, shipping and invoicing….

The integration will occur first with our Export divisions, followed by the companies in the United Kingdom, France, Germany and Australia. We expect our alliance to be finalised within twelve months, and we are committed to providing the resources necessary to ensure that the plan is implemented flawlessly…..

The Company is also announcing plans to create Product Specialty Teams for several of its product categories, including Respiratory and Sleep Therapy, Paediatric Rehabilitation and Pressure Prevention. These Product Specialty Teams will be another benefit of the new Drive DeVilbiss Healthcare, offering clinical expertise and guidance on the use and benefits of select products.

This value-added program will be available to all Drive DeVilbiss customers…..

..please be assured that we anticipate a seamless experience for you, our customer, and an enhanced partnership with Drive DeVilbiss Healthcare.

Should you have any questions, please feel free to contact us at questionsdevilbiss@drivedevilbiss.co.uk "

TK

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From ARTP Watchdog

Unanticipated costs can be NOX(ious)

The NOX T3 sleep screening device is one of the more popular devices around the world. It is distributed on the UK by Resmed but is actually manufactured in Iceland by Nox Medical. Watchdog has recently been made aware of the costs incurred when one or more clips on the battery compartment of the T3 break. We are advised that the whole case has to be replaced and the device returned to Iceland for the work to be done. The cost of the replacement is £500 which, on a device that typically retails for around £5000 is 10% of the original capital cost. To be absolutely fair to Resmed, they are not guilty of hiking the cost up. We are advised that they add £50 to the cost of the shipping and return to Iceland to cover their own costs and that does not seem unreasonable.

By drawing this example to the attention of Watchdog, it set us thinking about how many sleep screening devices there are in use and how many services experience problems with basic unreliabilities such as battery compartment catches being not as robust as one might expect. Obviously, good care has to be taken when opening and closing battery compartments and it may be that the NOX T3 is no better nor no worse than any others on the market. How long should the clips on a battery compartment on a device costing £5000 last? Well, the devices are required under UK law to be of merchantable quality and fit for the purpose for which they are intended. The NOX T3 comes with a 2-year warranty we understand. Are broken mechanisms on the battery compartment covered by that warranty? One would expect that a capital device of this nature should last in normal serviceable operation for a period of around 5 years. It is not unreasonable therefore to expect the battery compartment catches to be robust enough to survive 5 years. What kind of testing goes into simple things like this? Well, we'd like manufacturers to tell us please and we'd also like you to tell us about the reliability issues you have experienced with sleep screeners.

AM

Complaints

Don't forget, if you have any problems regarding equipment malfunction, quality control / calibration, service response times, software issues etc. please feel free to voice your opinions off the forum by contacting the Manufacturers Liaison Committee direct at Watchdog@artp.org.uk. We will then be able to collate this information, including verification of accuracy, before commencing on an appropriate course of action.

Finally, to all the manufacturers who may be reading this article, please remember to keep us posted with details of any new products you are about to release on the market and other relevant company news. Details should be sent to Tom Kelly or Matt Rutter at manufacturersliaison@artp.org.uk

MINUTES OF THE 40TH ANNUAL GENERAL MEETING (AGM) OF THE ASSOCIATION FOR RESPIRATORY TECHNOLOGY AND PHYSIOLOGY (ARTP)

HELD AT THE HOTEL RUSSELL, LONDON ON 14TH JANUARY 2016 AT 15.15.

Dr Karl Sylvester (KS), ARTP Honorary Chairman welcomed the audience that was in excess of 70 people and outlined the agenda for the AGM.

Review of 2015 Objectives

The key 2015 aims & objectives of the ARTP were reviewed and progress was reported as follows:

* Review ARTP/BTS Respiratory Function Guidelines - ongoing
* Update policies and procedures and make available on the website - completed and ongoing
* Expand e-portfolio's to deliver e-CPD for members – completed and ongoing
* Website investment and development – ongoing
* Develop further relationships with external organisations e.g. BLF – ongoing
* Research Objectives – ongoing
* Educational objectives – completed
* Financial objectives - completed

Communications

Chris Jones (CJ) presented the Communications Committee report and detailed the current ARTP Publications:

* ARTP Journals
  * Inspire
  * S-NEWS

He noted that Exhale had been discontinued

* Monthly Newsletters (email)
* ARTP Website
* ARTP Forum
* Social Media
  * Twitter
  * Facebook

CJ gave thanks to the whole Editorial Group, especially Aidan Laverty and Paul Burns (Inspire), Vicky Cooper (S-NEWS) and Geraldine O'Connell-Ramsay for her role as Regional Groups Coordinator.

Website Statistics

Total Number of Visits = 75,216 (~206/day). An increase since last year

Average of 3.37 pages per visit

Website Activity

Position	Most popular page	Most popular source	Country of origin
1	Homepage	Google/Bing/Yahoo etc	United Kingdom (same)
2	Spirometry > Current Courses	NHS Careers	United States (same)
3	Patient > Exercise > SWT	Patient.co.uk	India (same)
4	Members > Log In	Facebook	Australia (up from 6th)
5	Spirometry > Full Certificate	Patient.Info	Brazil (same)
6	Spirometry > Homepage	Twitter	Canada (up from 7th)
7	Professionals > ARTP-Standards > QADS	Indeed.com	Ireland (down from 4th)

Twitter and Facebook Activity

* Facebook: ARTPNews
  * 2012 Likes = 30
  * 2013 Likes = 64
  * 2014 Likes = 95
  * 2015 Likes = 156
* Twitter: @ARTP_News
  * 2012 Followers: 22 Following: 35
  * 2013 Followers: 89 Following: 51
  * 2014 Followers: 177 Following: 90
  * 2015 Followers: 299 Following: 106
  * For this conference: @artp40th

Targets for 2016 were given as:

* ARTP (Re)Branding
  * Currently in progress = 5 tenders obtained
* Website Development Document
  * E-Commerce, Spirometry Section, Online membership database
  * Out for Tender (including to our current provider)

National Strategy Day

KS outlined the National Strategy Day that was held in Nottingham on 5th October 2015. The meeting was well attended with 46 delegates and 16 manufacturers exhibiting.

ARTP Collaborations

KS gave an overview of current ARTP collaborations that included the ARTP/BTS Strategic Delivery Board and ERS. He outlined an agreement signed by the ARTP President & Chair with the ERS for joint ARTP/ERS membership costing an additional £20 to the ARTP membership cost. Members will have the option to 'opt in' when renewing membership.

ARTP Liaison

KS outlined the current ARTP Liaison activities:

British Thoracic Society

* ARTP/BTS Strategic Delivery Board
* Summer BTS Meeting
* Education Committee

Dept of Health

* MSC Team
* (Respiratory Futures)

Royal College of Physicians

* IQIPS Programme
* National COPD audit

British Lung Foundation

* Patient Information plus other workstreams

National School for Healthcare Science

* Themed Board

European Respiratory Society

* Assembly 9 / Group 9.1
* Member Organisation
* ERS 2016

Respiratory Education UK / Education for Health

Spirometry Training

National Inhaler Group

Academy of Healthcare Science

* Member Organisation

Financial Report 2014-15

KS delivered the financial report on behalf of Emma Spence (ES), Honorary Treasurer, and explained the income and expenditure for the preceding year.

Summary:

* Total assets around £331K
* 2013/14 Surplus of £34,878
* 2014/15 Surplus of £60K

All accounts on ARTP website

http://www.artp.org.uk/en/members-area/accounts/index.cfm

The delegates with voting rights accepted the financial report unanimously.

The financial objectives for 2015 and their progress were reviewed as follows

* Review budget setting for ARTP Committees - complete and ongoing
* Continue to utilise independent financial advice – complete and ongoing
* e-merchandising and payments - ongoing
* Business planning process – complete and ongoing
* Business planning process - Complete and ongoing
* Reinvest surplus into ARTP (e-portfolios, website) - Complete and ongoing

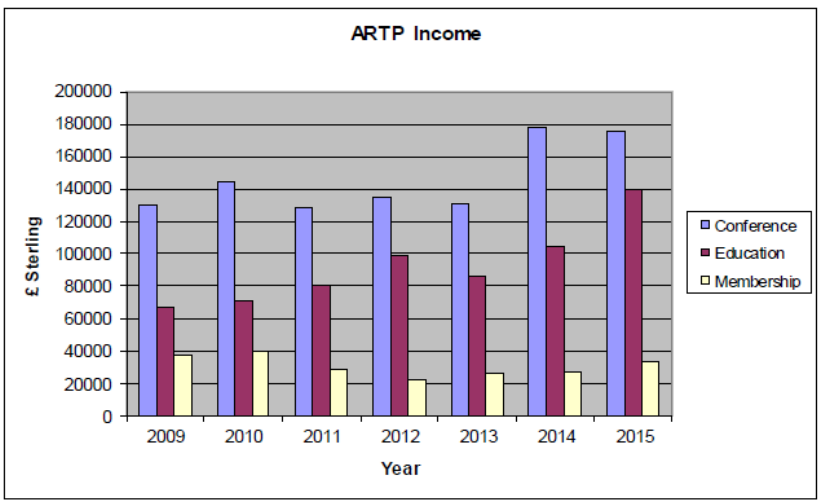
The financial objectives for 2016 were given as:

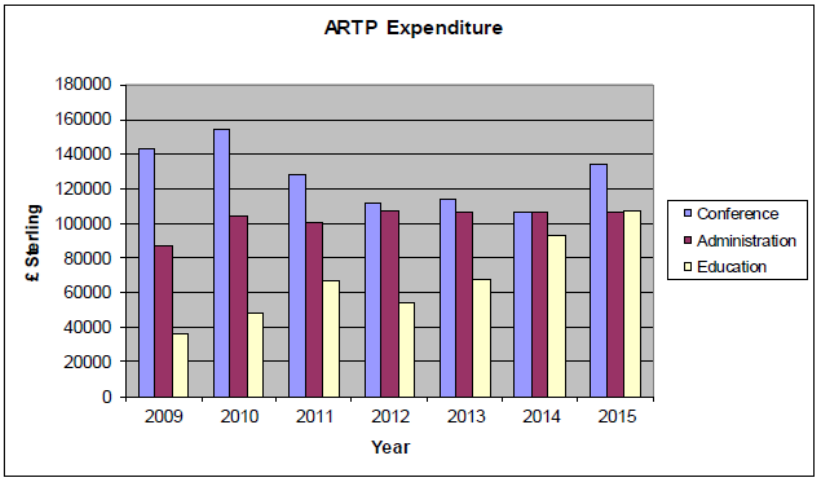
* Offer 5 * £300 bursaries for the Summer BTS, along with the bursaries for ARTP and ERS conferences
* Review budget setting for ARTP Committees
* Continue to utilise independent financial advice
* e-merchandising and payments
* Business planning process
* Reinvest surplus into ARTP (e-portfolios, website)

ES asked that the following were thanked:

* Membership & Manufacturers
* Mark Hubbocks (NED)
* EBS Ltd
* Please contact: treasurer@artp.org.uk

A reminder that members are able to claim tax relief for their subscriptions was given





Education Report

Joanna Shakespeare (JS), Education Chair detailed the current members of the Education Committee.

The following courses ran in 2015:

* Blood Gas Sampling Course X 2
* Physiologist Reporting Course - Glasgow
* CPET Course – Belfast & Cardiff
* Masterclass Course – Birmingham
* Paediatric Spirometry – Glasgow & London
* NIV Course – Bristol
* Occupational Asthma Course - Birmingham

Courses planned for 2016 were given as:

* Sleep course – Birmingham 11th Feb
* Blood Gas Sampling – Lichfield March
* Masterclass Course – Glasgow 18th-19th April
* Physiologist Reporting Course – Cardiff 16th-17th May
* CPET – Birmingham October (provisional)
* Blood gas sampling and supplemental oxygen – November (provisional)

JS gave an update on spirometry along with thanks to Vicky Moore, Francesca Turley and all of the Spirometry Committee

* Spirometry handbook should be coming very soon – in final stages for printing
* Successful centre update day held in September
* Paperwork for all certificates has been updated for candidates and markers
* Updated due to candidate and centre feedback, more primary care focussed.

ARTP Part 2 Examinations

In 2013/14 there were 24 candidates registered for ARTP Part 2

ARTP Professional Examinations:

* To date 59 candidates enrolled onto qualification
* Associate – 19 registered, 9 completed
* Practitioner – 40 registered, 31 completed
    * 2 officially withdrawn
    * 23 outstanding IRCP's (5 presumed withdrawn)
    * 5 failures

Examination dates were given as:

Associate (Level 1) & Practitioner (Level 3) Exams

* Spring – 16th April 2016
* Autumn – 15th October 2016

The OSFA examinations were described for the STP course for the first 5 respiratory candidates. All students were successful, two following a resit examination.

JS stated that the intake for STP students for 2016 was 12 and encouraged departments to consider taking a student

The objectives for 2015 were reviewed:

* Launch Level 2 Clinical Examination - Complete
* Support OSFA's for first respiratory cohort - Complete
* Launch e-portfolio's for all ARTP competency based qualifications – In progress
* Launch revised spirometry and Part 1 Handbooks – In progress
* Launch occupational

asthma certificate - Complete

* Continue to pursue MSc modules - Ongoing

The objectives for 2016 were set as follows:

* Develop e-Learning opportunities
* Develop handbook to support professional examinations
* Oximetry interpretation certificate
* Continue to support and build OSFA's
* Adapt professional exams specifically for paediatrics

ARTP Sleep

Dr Victoria Cooper (VC) detailed and thanked the members of the ARTP Sleep Committee. The aims for 2015 were reviewed:

* To have regular meetings - completed and ongoing
* To have good communication – completed and ongoing
* To launch the oximetry certificate - completed
* To deliver the basic sleep course –almost completed
* To develop a multi-channel certificate – in progress
* To develop a CPAP certificate - in progress
* To develop an ARTP Sleep Handbook to cover all certificates - in progress

The achievements of ARTP Sleep in 2015 were detailed:

* 12 candidates registered for the ARTP oximetry certificate (3 completed)
* Improved working relationship with British Sleep Society working towards one professional body for Sleep Professionals
* 2 Editions of S-NEWS
* Work to improve the PTP curriculum to include more sleep

VC outlined the aims for 2016

* To (continue to) have regular meetings
* To further improve communication
* To deliver the basic sleep course (11th Feb 2016)
* To develop an oximetry interpretation certificate
* To develop a CPAP certificate
* To develop an ARTP Sleep Handbook to cover all certificates
* To progress with professional body and state registration issues for sleep

Aims for British Sleep Society & ARTP SLEEP

ARTP SLEEP & BSS (Technical & Scientific) Group

* Joint work on technical/ scientific standards
* Joint working on education/training and courses
* Joint working on STP and HSST regulation
* Joint membership option for both organisations
* ARTP SLEEP to lead professional body role for sleep technologists & scientists

Constitutional Issues

KS detailed the current members of the ARTP Council including the appointment of a new Medical non-executive director

Role	
Chair	Dr Karl Sylvester
Vice Chair	Julie Lloyd
Honorary Secretary	TBC
Honorary Treasurer	Emma Spence
President	TBC
Human Resources/Workforce	Ken Hutchinson
Financial	Mark Hubbocks
Patient	Robin Baldwin
Medical	Dr James Hull

He then detailed the ARTP Board format and Committee Chairs for 2016 and outlined and thanked the members of each committee

Committee	Chair
Communications	Chris Jones
Workforce	Claire Stacey
Standards	Ian Cliff
Paediatrics	Paul Burns
Education & Training	Joanna Shakespeare
Events	Kelly Pauley
Sleep	Dr Victoria Cooper

KS asked for eligible members to vote for the following:

Secretary – Tracey Fleming

Vote to stand for another term

ARTP President – Martyn Bucknall

Endorsement of appointment

The membership accepted these nominations

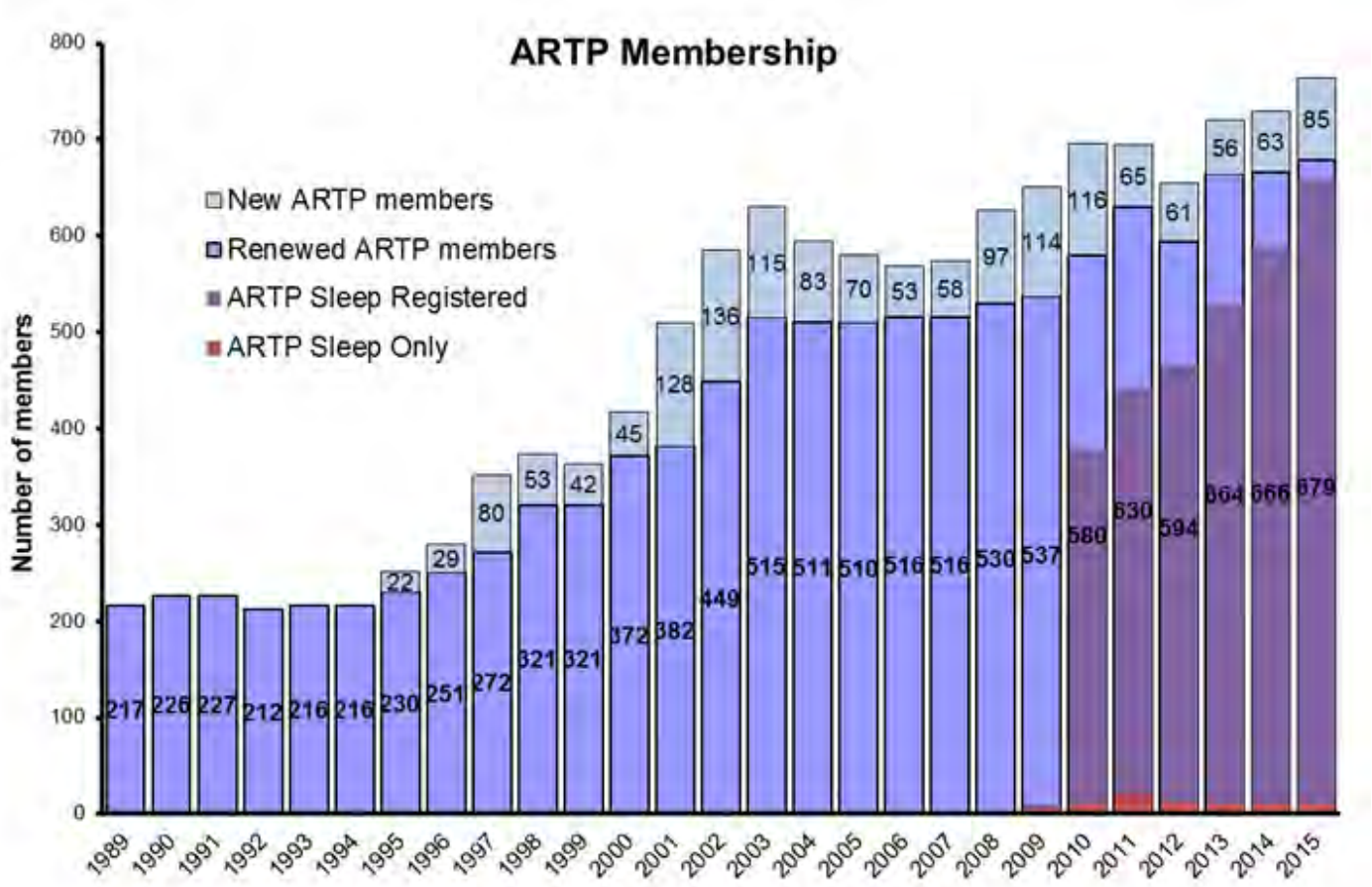
KS encouraged members to sign up to the ARTP Jobs Board at the ARTP stand to help the different committees.

KS highlighted the need for more responses to the ARTP Workload and Staffing Survey

ARTP Membership

2016 Key Objectives

* Production of ARTP/BTS Respiratory Function Guidelines
* Updating the ARTP brand
* Website redevelopment
* Development of on-line courses and educational material
* Supporting ERS in London 2016
* Continuing to work and develop new relationships with organisations
* Research objectives
* Educational objectives



Benefits of ARTP Membership

KS detailed the following benefits of ARTP membership

* Joint ERS membership
* Discounted Training Course fees
* Subsidised conference attendance
* Bursaries available (i.e. ARTP, ERS, BTS)
* Competitive membership fees
* e-Inspire / SNews
* Textbooks
* Email Forum
* Website Resources
* Active Committees

KS then thanked EBS, the ARTP Council, all of the ARTP Committees and working groups for their hard work over the past year.

KS asked the delegates if there were any questions. As there were none the meeting was brought to a close.

KS announced that the venue for the ARTP conference in 2017 was Belfast

Tracey Fleming

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IDENTIFICATION OF EARLY LUNG DISEASE IN ALPHA-1 ANTITRYPSIN DEFICIENCY AND ITS IMPACT ON HEALTH STATUS

J.A. Stockley, B.G. Cooper, R.A. Stockley, E. Sapey
Lung Function & Sleep, Queen Elizabeth Hospital Birmingham, B15 2WB

Rationale: The natural history of the development of lung disease in α-1 antitrypsin deficiency (AATD) is largely unknown. However, Hogg and colleagues (*NEJM 2004; 350 (26): 2645-53)* suggested that loss of small airways was an early histological feature of the disease and may precede the development of emphysema. Early detection of disease and its rate of progression are important in individuals with AATD for identifying which patients would be more likely to benefit therapeutic interventions, such as Alpha-1 Antitrypsin augmentation.

The purpose of the present study was to measure small airways function using the Mean Mid-Expiratory Flow (MMEF) in never-smokers with AATD and determine its relationship to traditional spirometric indices, CT densitometry and health status.

Methods: We collected retrospective data on the 198 never-smokers with a "ZZ" AATD phenotype. We plotted MMEF %predicted against FEV_1/FVC ratio. The strength of the correlation was assessed with the Spearman's Rank Coefficient. The relationship of MMEF to CT densitometry was assessed in the same manner and a Voxel Index of -910 HU to separate normal from emphysematous lung. St George's Respiratory Questionnaire (SGRQ) scores were used as a measure of disease impact and health status and compared using a Mann-Whitney U test.

Results: There was a curvilinear relationship with a strong correlation (r^2 = 0.845, p < 0.0001) between the MMEF expressed as a % predicted and the FEV_1/FVC ratio. This permitted the population to be divided into 3 groups; those with both normal MMEF (> 80% predicted) and normal FEV_1/FVC (Group A), those with abnormal MMEF but normal FEV_1/FVC ratio (Group B) and those with both tests abnormal (Group C). These data are summarised in Figure 1.

On average, Group B had a faster rate of decline in FEV_1 % predicted than Group A (p = 0.024). In addition, Group B also had a worse total SGRQ score than Group A (p < 0.01) and scored worse for questions relating to both activity (p < 0.001) and the impact of respiratory symptoms on social functioning (p = 0.028).

The relationship of MMEF to lung density was also curvilinear (r^2 =0.553, p < 0.0001). 10% of the 95 patients in whom CT densitometry was performed had evidence of small airways disease but no emphysema.

Conclusions: Reduced MMEF is often present in subjects with a normal FEV_1/FVC ratio. Such patients have reduced health status and a more rapid decline in FEV_1. A proportion of never-smokers with reduced MMEF have no radiological evidence of emphysema, which supports the hypothesis of Hogg and colleagues that small airways disease may be the earliest change in disease development. These data suggest tests of small airways function may detect individuals with AATD who will progress at the earliest stage.

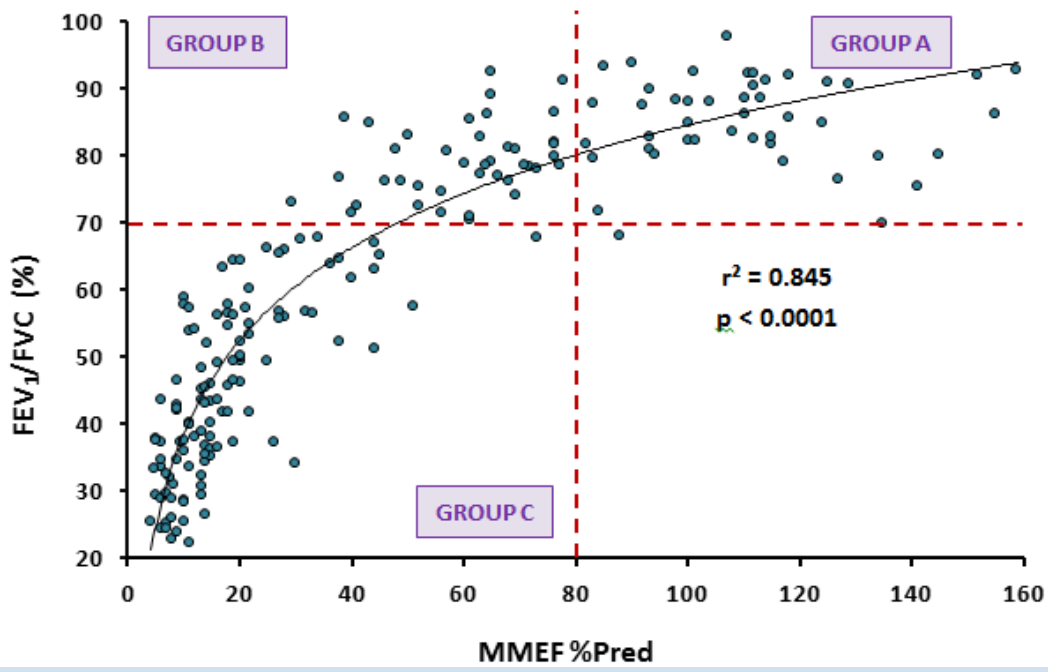

Figure 1: Relationship between MMEF (% predicted) and FEV_1/FVC ratio in never-smokers with AATD. Each point is the data from a single patient (n=198). Airflow obstruction is still currently defined by an FEV_1/FVC ratio <70% (horizontal red dotted line) and MMEF <80% predicted may be considered abnormal (vertical red dotted line).

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QUALIFIED HEALTHCARE SCIENCE PRACTITIONERS PERCEPTIONS SURROUNDING REFLECTION AND REFLECTIVE PRACTICE

Laverty, J. Faculty of Science and Engineering, University of Wolverhampton and Faculty of Humanities and Social Sciences, Oxford Brookes University

The need for quality educational provision to facilitate the development of a well-educated, skilled workforce has been recognised as essential for high quality healthcare [1]. Clinical supervision, including regular protected time for in-depth reflection, is a process of learning which enables practitioners to develop and assume responsibility for their practice in a variety of complex clinical situations [2]. Self-verification is achieved by individuals compiling personal profiles by reflection on experiences. This assumes that practitioners are capable of, and willing to, document their reflections.

Successful reflection requires expert guidance with the supervisor being pivotal student practitioners' engagement with the reflective process; acting as role models for students in the clinical environment. If professionals in practice are not openly engaging with reflection to support their own development this may affect student's perception of the usefulness of reflection [3].

Aim: The aim of the enquiry was to seek to understand qualified healthcare science practitioners perceptions surrounding reflective practice as an aid to continuing professional development.

Methodology: The study explored individuals' understandings and was grounded within a social constructivist framework. Research questionnaires were completed by thirty eight qualified practitioners and semi structured interviews were conducted with five qualified practitioners each involved in the training of student healthcare scientists. The inquiry was primarily explorative seeking to ascertain how practitioners viewed the use of reflection to support continuing professional development. Constant comparative thematic analysis of the questionnaires and interview transcripts allowed emerging themes to be identified. The hermeneutic nature of the inquiry permitted participants access to the data after transcription, this provided an element of triangulation and allowed consideration of the data from multiple perspectives.

Findings: Emerging themes suggest that qualified practitioners consider that focussed reflection requires time and effort with many practitioners not engaging with reflection under pressing circumstances. Participants perceived the reflective process to be an internal, personal and cognitive task with limited engagement with peer reflection. Reflection appeared driven by an evaluative and judgemental framework, concerned with patient interactions and not focussed on other areas of practice

Conclusions: Initial findings suggest that healthcare science practitioners do not overtly value reflection as a tool to facilitate professional development with the limitations and barriers identified outweighing any perceived benefits.

References:

1 Department of Health (2010) Modernising Scientific Careers: The UK way forward. London: Department of Health Publications.

2 Driscoll, J. (2007) Practising Clinical Supervision: A Reflective Approach for Healthcare Professionals (2nd Edition). Oxford: Bailliere Tindal Elsevier.

3 Ward, A. and Gracey, J. (2006) Reflective practice in physiotherapy curricula: a survey of UK University based professional practice coordinators. Medical Teacher, 28(1), pp.32-39.

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CAN INTERMITTENT NEGATIVE AIRWAY PRESSURE CAUSE A SUSTAINED ELEVATION IN VENTILATION?

Griffin HS [1], Al Humoud S [2], Benson JG [2], Cooper BG[1], Balanos GM [2]

1 Queen Elizabeth Hospital Birmingham, Lung Function and Sleep 2 University of Birmingham, School of Sport, Exercise and Rehabilitation Sciences

Background:

The upper airway in humans and other animals is lined with mechanoreceptors that respond to negative pressure. When stimulated they cause a short latency neural reflex that results in the coordinated contraction of various muscles that maintain airway patency.

A recent study on rats showed that exposure of these receptors to intermittent negative airway pressure (INAP) caused a sustained elevation in ventilation that lasted for at least an hour following cessation of INAP (1). This phenomenon is referred to as ventilatory long-term facilitation (vLTF) and is more commonly demonstrated in both rats and humans following exposure to intermittent hypoxia (IH). Rodent studies have shown that vLTF following IH is due to the accumulation of serotonin at synaptic junctions in the spinal cord. Possibly mediated by the same mechanisms, IH has recently been shown to improve calf strength and walking distance in patients with incomplete spinal cord damage (1,2).

Despite these remarkable effects of IH, its use as a rehabilitation tool remains controversial because of emerging evidence to suggest IH may increase the risk of developing cardiovascular disease. Exposure to INAP may pose a lower health risk than IH and based on the recent findings in rats that it induces a comparable level of vLTF, it is tempting to speculate that it may also induce similar adaptations in the same spinal cord.

Therefore, we have recently begun a study to investigate whether INAP can induce vLTF in humans.

Methods:

In this ongoing study, 3 healthy male volunteers (all aged 21) undertook two experimental trials (INAP and Control) in a randomised order. In the INAP trial participants were exposed to one hour of 30-second episodes of breathing against negative pressure (-10 cmH20) interspersed by 60-second intervals of breathing at ambient pressure. In the Control trial participants breathed at ambient pressure for one hour. In both trials changes to ventilation were assessed by comparing ventilation during the final 5 minutes of a 20-minute baseline period prior to the intervention, with the final 5 minutes of a recovery period of corresponding duration. When ventilation measurements were made the partial pressure of carbon dioxide was maintained at ~3 mmHg above normal because evidence from our group and others has shown this to be a requirement for unmasking vLTF. This study was conducted following approval by the local ethics committee.

Results:

In the INAP trial minute ventilation during the baseline period was 12.9 L/min ± 1.1 and was similar during recovery at 13.5 L/min ± 2.4. In the control trial minute ventilation during the same time periods were comparable with those of the INAP trial (Baseline: 14.6 L/min ± 1.5 and Recovery: 13.9 L/min ± 1.8). Data shown as mean ± SD.

Conclusions:

Conclusions cannot be made from such a limited sample size but this early data may indicate that INAP does not induce vLTF in awake humans.

References:

1) Ryan (2009). J Physiol 587.13, 3343–3353
2) Hayes (2013). Neurology, 2014;82:1–10
3) Trumbower (2012). Neurorehabilitation and Neural Repair, 26, 163-172

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EXTENDED VALIDATION OF EMPHASIS-10 QUALITY-OF-LIFE QUESTIONNAIRE

Smith I[1], Billings CG[1], Kiely DG[1], Yorke J[2], Armstrong I[1]
1Sheffield Pulmonary Vascular Disease Unit, Royal Hallamshire Hospital, Glossop Road, Sheffield. 2School of Nursing, Midwifery and Social Work, University of Manchester, Manchester,

Background: Pulmonary Hypertension (PH) is a chronic life-limiting disease that results in a large symptom burden. Patient-reported outcome is an important aspect of assessing the response to therapy. A PH-specific health-related quality-of-life questionnaire (emPHasis-10) has therefore been devised for routine clinical use [1] and has been validated for use in Group 1 PH Pulmonary Arterial Hypertension (PAH). However, due to small study numbers, the validity of ePHasis-10 in Group 4 PH (Chronic Thromboembolic PH (CTEPH) was not confirmed. In addition, although emPHasis-10 scores discriminated subgroups of patients stratified on World Health Organization (WHO) functional class II and III, there were insufficient numbers of patients in WHO functional class I and IV to draw any conclusive results. Further validation of emPHasis-10 is therefore required.

Aims: Using exercise capacity and WHO functional class, the aim of this study was to further validate the use of emPHasis-10 in PH.

Methods: Data was retrieved from our hospital databases for patients with a confirmed diagnosis of pulmonary hypertension attending our Unit between June 2014 and September 2014 and who had completed emPHasis-10 (scores range from 0-50, high scores denote worse QOL) on the same day as completing an incremental shuttle walk test (ISWT). Patients were excluded if data was missing from either the emPHasis-10 or ISWT. Validity was assessed by evaluating correlation between emPHasis-10 score and ISWT distance (Pearson correlation) and association with subgroups stratified by WHO functional class (calculated using ANOVA).

Results: Data was retrieved for 296 patients (Table 1). A moderate negative correlation between the empPHasis-10 score and the ISWT distance (-0.512, p<0.001) and % predicted ISWT (-0.565 p<0.001) was found. Moderate correlation was also found when analyzing the PAH (-0.493, -0.525 both p<0.001) and CTEPH (-0.556, -0.638 both p<0.001) subgroups separately. A highly significant association was found between WHO functional class and emPHasis-10 score and emPHasis-10 scores discriminated significantly between all subgroups of patients stratified on WHO functional class (Figure. 1).

Conclusion: This study has shown that emPHasis-10 quality-of-life score correlates significantly with exercise capacity and has strong discriminative properties between subgroups of the World Health Organization classifications. The study has therefore confirmed the validity of emPHasis-10 in PH and in addition has demonstrated its validity in the subgroup of patients with CTEPH. The findings support the use of emPHasis-10 in routine clinical use.

Reference:

[1]. Yorke J, Corris P, Gaine S, Gibbs JS, Kiely DG, Harries C, Pollock V, Armstrong I. emPHasis-10: development of a health-related quality of life measure in pulmonary hypertension. Eur Respir J 2014;43(4):1106-1113.

Patients n	296
Female n **(%)**	194 (65.5)
Age years mean±sd	59.8 ±15.7
Clinical Classification of PH **n (%)**	
Group 1 Pulmonary Arterial Hypertension	209 (70.5)
Group 2	2 (0.5)
Group3	6 (2)
Group 4 Chronic Thromboembolic PH	74 (25)
Group 5	5 (2)
Who Functional Class n (%)	
I	11 (4)
II	75 (25)
III	181 (61)
IV	29 (10)
ISWT distance m mean±sd	246 ± 207
EmPHasis 10 mean±sd	25 ± 25

Table 1. - Patient characteristics

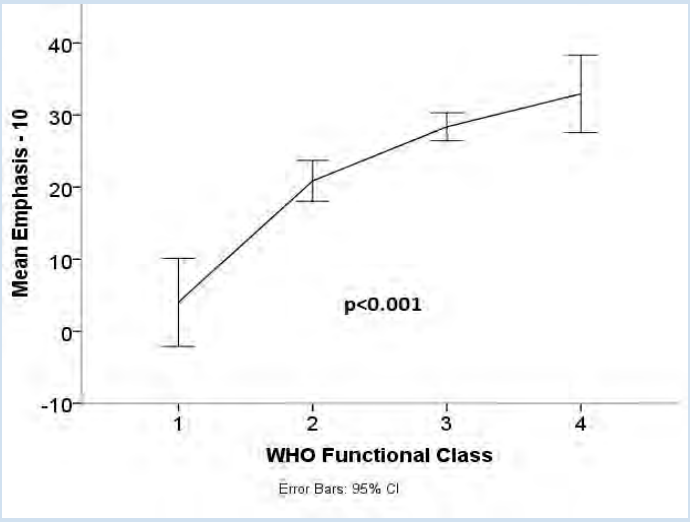

Figure 1. Association between emphasis-10 and WHO functional class. Mean difference in emPHasis-10: Class I-II (13.4, p<0.001), Class II-III (10.1, p<0.001), Class III-IV (5.2, p=0.026).

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PREDICTING MORBIDITY IN PAEDIATRIC PATIENTS POST SPINAL SURGERY: RETROSPECTIVE COHORT STUDY

Mahdi, FSA.[1,2], Russo, K.[2], Kirkby, J.[1], Aurora, P.[1] Laverty, A.[1,2], Lung Function Department[1] and Sleep Unit[2] Great Ormond Street Hospital for Children NHS foundation Trust.

Aims: Paediatric Scoliosis patients requiring surgery are screened for risk of post-operative complications. Recently our Trust evaluated the Spinal Surgery Pathway and decided to include criteria for performing cardiorespiratory sleep studies in addition to Spirometry. The aim was to investigate whether Spirometry tests or cardiorespiratory sleep outcomes predict morbidity in paediatric spinal surgery patients and whether abnormal outcomes in these preoperative assessments result in a longer stay in PICU (Paediatric Intensive Care Unit).

Methods: 290 patients from the scoliosis pathway at a leading paediatric tertiary centre who had Spirometry and/or sleep assessments before spinal surgery between January 2012 and September 2014 were evaluated. 194 patients had spirometry measurements (FEV_1, FVC and FEV_1/FVC ratio) and were evaluated and subdivided into degrees of severity using Global Lung Initiative (GLI) reference data.[1,2] 96 patients underwent cardiorespiratory sleep studies and nocturnal mean SpO_2, nocturnal mean $TcCO_2$ and time SpO_2 < 92% was evaluated. The length of time spent in PICU was used as a marker for morbidity. The statistical tests used were the Kruskal-Wallis test (Spirometry data) and the Spearman coefficient (Sleep data). Results calculated using SPSS v.21 (IBM Corp. Armonk, NY).

Results: Table 1 shows median and Interquartile ranges of each outcome. 31% of Spirometry patients required PICU with a mean stay of 14 hours, whereas 77% of the sleep patients required PICU with a mean stay of 42 hours. This suggests more disease progression in the Sleep patients.
PICU stay had an inverse relationship to FEV_1 and FVC results, with an increased risk of PICU the higher the degree of abnormality as seen in figures 1 and 2, but no statistically significant relationship with FEV_1/FVC ratio. Measurands of cardiorespiratory sleep studies do not show statistically significant relationship with PICU stay.

Conclusion: In paediatric scoliosis patients, FVC and FEV_1 results have an inverse relationship to morbidity, thus confirming spirometry as an effective screening tool for identifying post-operative complications and could potentially be used to identify patients who require a more detailed care plan. Cardiorespiratory sleep studies did not identify patients who required a longer PICU stay; this may be due to the sicker cohort of patients.

References:

	Median Value	IQR
FEV_1 Z-Scores	-2.7	-3.95;-1.56
FVC Z-Scores	-2.32	-4.12;-1.29
FEV_1/FVC Ratio Z-Scores	-0.74	-1.46; 0.25
Nocturnal Mean SpO_2 (%)	96	95;97
Nocturnal Mean $TcCO_2$ (mmHg)	44.5	42; 47
Time SpO_2 was below 92% (%)	0	0;0.5

Table 1 – Median and Interquartile Ranges of the Study Measurands

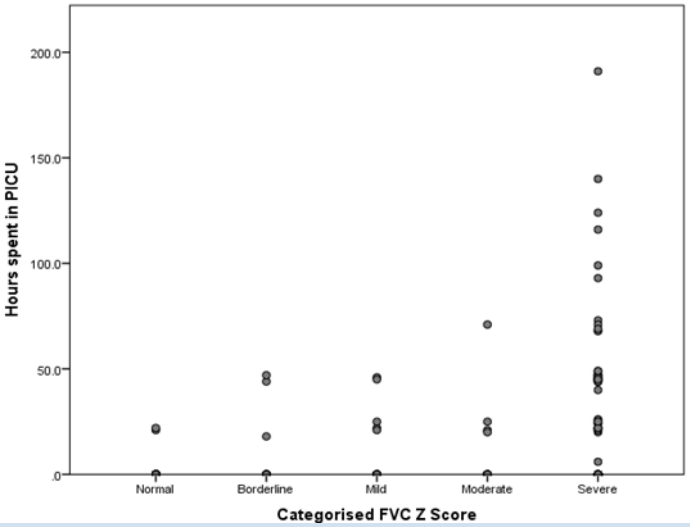

Figure 1 - FVC Z-score categorised against hours spent in PICU

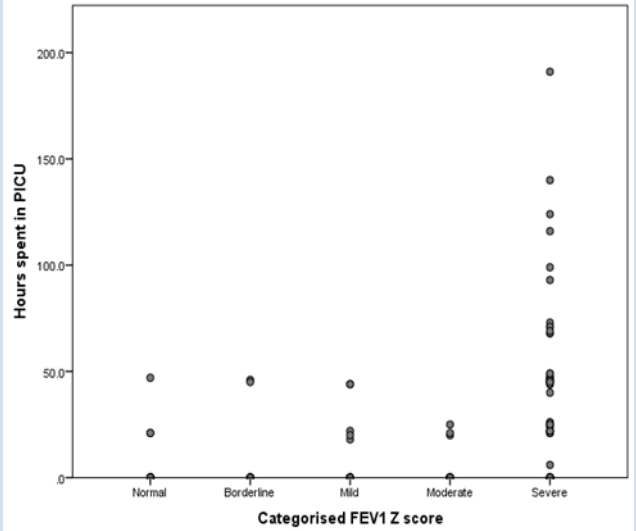

Figure 2 - FVC Z-score categorised against hours spent in PICU

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LCI AS AN ENDPOINT IN COPD: COMPARISON WITH HEALTHY CONTROLS, USING SF_6 AND NITROGEN WASHOUT

A S Bell[1,2], D Singh[1,2], A Horsley[2]

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2 University of Manchester, University Hospital of South Manchester

Background:

Lung Clearance Index (LCI) is well established in cystic fibrosis (CF), but has not been widely applied in other diseases. Commercial systems are available for SF_6 & nitrogen (N_2) multiple breath washout (MBW).

Objectives:

LCI, FRC and test time were evaluated in COPD patients & healthy controls (HC) using 2 different validated washout devices to assess suitability as an outcome measure in COPD.

Methods:

MBW was performed on the same day in triplicate using an indirect N_2 MBW system (Exhalyzer D) & a modified Innocor™ SF_6 analyser, in random order. Results are expressed as mean (SD) and differences assessed using unpaired T-test unless otherwise stated.

Results:

18 COPD patients (age 64 (7.2) yrs, FEV_1 63 (21.9) % predicted), and 10 HC (25 (22-30)a yrs, 101 (13.2) % predicted) were enrolled.

1 COPD subject was unable to perform N_2 MBW due to repeated leakage, and was excluded from comparison.

In patients with COPD, LCI & FRC% were greater than HC values in both systems.

$FRCSF_6$ %=112 (28)% in COPD vs 106 (22)L in HC, p=ns.

$FRCN_2$ %=137 (43)% in COPD vs 105 (28)% in HC, p=0.048.

$LCISF_6$=10.2 (1.5) in COPD vs 6.3 (0.2) in HC, p<0.0001.
$LCIN_2$=12.3 (2.2) in COPD vs 7.0 (0.6) in HC, p<0.0001.

$LCIN_2$ was greater than $LCISF_6$ in COPD (limits of agreement -3.7 to 4.6, p=0.40) & HC (-0.4 to 1.8, p=0.004).

Average total COPD test time was 40.7mins for triple N_2 MBW vs 32.1mins for SF_6 (p=ns).

Conclusions:

Similar to observations in CF, LCI measured indirectly using N_2 washout was higher than SF_6 in COPD & controls. Both systems differentiated COPD from healthy subjects but success rates were higher for SF_6 MBW. Long test times were a feature of both systems. Reducing time taken to wash tracer in is a potential method of improving SF_6 MBW.

References:

Robinson, P.D, Latzin, P, Verbanck, S, Hall, G.L, Horsley, A, Gappa, M, Thamrin, C, Arets, H.G.M, Aurora, P, Fuchs, S.I, King, G.G, Lum, S, Macleod, K, Paiva, M, Pillow, J.J, Ranganathan, S, Ratjen, F, Singer, F, Sonnappa, S, Stocks, J, Subbarao, P, Thompson, B.R, Gustafsson, P.M (2013) Consensus Statement for Inert Gas Washout Measurement Using Multiple- and Single-Breath Tests, European Respiratory Journal, (41), pp 507 -522

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A RETROSPECTIVE ANALYSIS OF THE MANAGEMENT OF MODERATE TO SEVERE WITHIN A LOCAL GENERAL NHS HOSPITAL

R J Glover1, J K Lloyd[1],

1 Good Hope Hospital, Sutton Coldfield, B75 7RR

Aim: This study retrospectively analyses patient acceptance, and operational efficacy relative to CPAP therapy applied to patients with moderate to severe OSA within the local general hospital. This service run according to NICE guidance and is operated by clinical scientists/physiologists using a protocol based approach twinned with clinical experience. Specialist physician input is available for complex cases.

Methods: 300 limited PSG studies dating from November 2013 were retrospectively reviewed and the outcomes relative to CPAP in patients with an AHI >15 were reviewed (104 cases). 196 studies were excluded (mild OSA [103]; incomplete data [26]; predominant CSA [15]; non-diagnostic/UARS [56]). Figure 1 details the pathway from G.P to diagnosis/therapy. Compliance with therapy has been defined as >4 hours.

Results: Table 1 and 2 display partial analysis of the results from the data obtained.

When considering symptomatic patients with moderate OSA (20), overall compliance was 50% (10/20). Mean days until CPAP intervention was 9 and 28 days for severe and moderate OSA, respectively, including patient cancellations and weekends. Treatment pressures are selected following home autoCPAP titration studies; therapy efficacy is checked at one month and where peformed in compliant patients was confirmed in 55/61 (90%) cases. Secondary changes to therapy pressures were required in 6 cases.

Conclusion: The results indicate that non-complex OSA, suspected by the patient's own G.P, can be rapidly confirmed and treated by non-medical healthcare professionals using a standard rules based diagnostic test and standard therapy; patient acceptance of therapy is similar to that reported in the literature[1,2]. This enables an effective joining together of diagnostic and treatment pathways, reduces the local cost burden of OSA, and highlights how integrating non-complex OSA services with community based services may succeed – a vision in keeping with NHS organisational strategy and the five year forward view.

Further Research: Further research is required to identify whether patient outcomes differ with this pathway compared to the traditional specialist physician approach and what safeguards are required to ensure differential diagnoses are processed appropriately.

References:

1 Weaver T, Kribbs N, Pack A. Sleep, 1997, 20:278

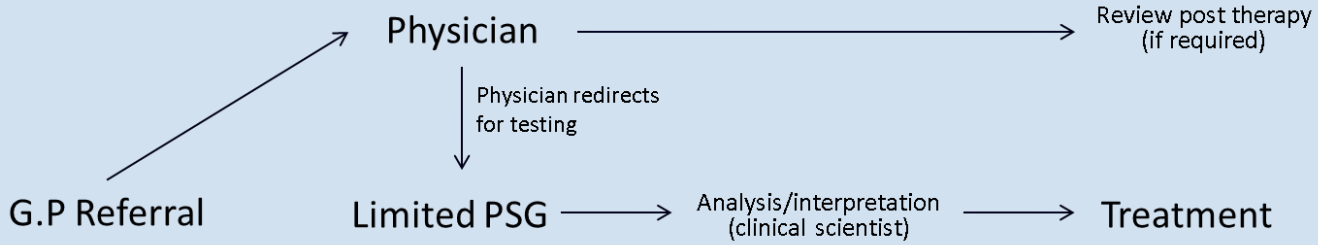

Figure 1: pathway to diagnosis and treatment for OSA

Severe OSA							
Number	AHI (SD)	BMI (SD)	Neck circum (SD)	On Therapy (% overall patients)	On therapy + Compliant (>4 hours)	Overall compliance	Mean days from diagnosis to therapy (SD)
68	57.8	38.1 (7.0)	45.3 (4.5)	60 (88%)	46	**67.6%**	9 (9)
Moderate OSA							
Number	AHI (SD)	BMI (SD)	Neck circum (SD)	On Therapy (% overall patients)	On therapy + Compliant (>4 hours)	Overall compliance	Mean days from diagnosis to therapy (SD)
36	21.4 (4.5)	37 (8.0)	42.1 (5.0)	18 (50%)	15	**41.6%**	14)

Tables 1 and 2 showing results

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DOES THE USE OF APAP DEVICES PROVIDE A MORE TIME EFFICENT AND COST EFFECTIVE THERAPY FOR THE TREATMENT OF OSA COMPARED TO THE CONVENTIONAL FIXED CPAP DEVICE?

Beadle L Mrs, Grew T Mr, Wimpress S Mr, Vara DD Mr, Respiratory Physiology Unit, Glenfield Hospital, Leicester, England.

Aims: The aims and objectives of this study is to compare the methods of manual titration and auto titration in the treatment and management of OSA, to establish which therapy is more beneficial in 3 areas; patient compliance, hospital visits and CPAP effectiveness. The hypothesis we used is:

H0 = There is no difference in patient compliance, hospital visits and CPAP effectiveness between manual and auto titration in patients with OSA.

H1 = There is a difference in patient compliance, hospital visits and CPAP effectiveness between manual and auto titration in patients with OSA.

Methods: A study was undertaken with 50 subjects (27 male and 23 female). The subjects had mild, moderate and severe obstructive sleep apnoea. Out of the 50 randomly selected patients 25 were issued an APAP machine set at a range of 5 – 20cmH_2O and the other 25 patients were issued a fixed CPAP (manual titration). Of the 50 subjects 42 were analysed and 8 (5 fixed, 3 Auto) were discarded from the study due to poor attendance etc. Both groups of patients were given questionnaires which included the Epworth sleepiness score. The number of visits and compliance was documented, along with a pre therapy and during therapy sleep study (Overnight pulsoximetry) being completed.

Results: To represent the 3 areas we were looking at we decided to analyse compliance, total number of visits (time effectiveness) and ODI/AHI on therapy (machine effectiveness).– Table 1. The unpaired t test was chosen to analyse the data, however we needed to establish whether the data was of equal or unequal variance. For more comprehensive results it was decided to split the 2 groups (Fixed/Auto) into smaller groups by using their severity grading (mild/moderate/severe).

Conclusion: The analysis showed no difference in compliance, time and machine effectiveness in any of the 3 graded groups, therefore we accept the H0.

Even though we chose to analyse 3 areas, other aspects may have influenced some of our results. Of the 50 subjects 13 had interface issues (6 auto and 7 manual) and 10 had other issues i.e. attendance (4 auto and 6 manual). This shows that interface had a major affect on the number of visits in a percentage of our subjects. Another area that may have influenced results would be department protocol. The number of visits may be biased by Glenfield's protocol as this was written for the issuing of manually titrated machines and not updated for the use of auto titrated machines.

From the data we collected we have the opportunity to develop the study further and look into the comparison of pressures (95th percentile vs. manually titrated) and see what effect this has on cost, compliance and number of visits.

Table to show Statistical analysis of compliance, total visits and ODI/AHI on therapy between fixed CPAP and APAP in patients with OSA

Variable	Value	Mild OSA	Moderate OSA	Severe OSA
Compliance	t Stat	0.03	-0.26	-0.99
	T Critical two-tail	±2.16	±2.45	±2.14
	P value	0.97	0.81	0.34
	Outcome	0.97 > 0.05 (**Accept H_0**)	0.81 > 0.05 (**Accept H_0**)	0.34 > 0.05 (**Accept H_0**)
Total Visits	t Stat	0.43	1.13	2.13
	T Critical two-tail	±2.16	±2.45	±2.14
	P value	0.67	0.30	0.05
	Outcome	0.67 > 0.05 (**Accept H_0**)	0.30 > 0.05 (**Accept H_0**)	0.05 = 0.05 (**Accept H_0**)
ODI/AHI on therapy	t Stat	-1.03	-0.91	1.78
	T Critical two-tail	±2.23	±2.78	±2.36
	P value	0.33	0.41	0.12
	Outcome	0.33 > 0.05 (**Accept H_0**)	0.41 > 0.05 (**Accept H_0**)	0.41 > 0.05 (**Accept H_0**)

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AN AUDIT COMPARING NOXTURNAL LIMITED POLYSOMNOGRAPHY AUTOMATED SCORING TO PHYSIOLOGIST SCORING

Clarke,D; Goodlad, M; Matharu,T; Mata, I; Shakespeare,J. Respiratory Physiology and Sleep Department, University Hospitals Coventry and Warwickshire NHS Trust.

Aims and objectives:

The aim and objective of the study was to see if the Noxturnal limited polysomnography software was accurate in scoring apnoea/hypopnoeas in the diagnosis of obstructive sleep apnoea. If successful this would allow the department to pre book CPAP issues for straight forward sleep apnoea patients, reducing waiting times. The principal hypothesis is how automated analysis of limited polysomnography studies using Noxturnal software compares with manual scoring by physiologists and whether automated scoring makes a difference to categorising the severity of OSA and treatment offered.

Methods:

Data collection took place from September 2014 to July 2015. Software used was Resmed Noxturnal limited polysomnography. 188 studies were software scored and documented and were then analysed by a respiratory physiologist experienced in analysing sleep studies and the AHI was documented. Data was analysed statistically using GraphPad InStat.

Results:

Studies from 188 patients (138 Male), mean age 50 years, mean BMI 36.5 kgm2, mean collar size 17.5 inches, were analysed. Median AHI for the group, using software scoring was 15.70 (IQR 5.20 – 30.00) compared to a physiologist scored AHI of 17.80 (IQR 6.20 – 31.20). This was not statistically significant with a p value of 0.23.

OSA severity was categorised according to the automated score and this is illustrated in Table 1. The median AHI was compared and was statistically significantly different for those classified as normal, mild and moderate. There was no difference in categorisation for those with severe sleep disordered breathing. There was also a tendency for the physiologist to score higher than the automated software.

Conclusion:

In conclusion there were statistically significant differences between scoring within severity categories. Results suggest that studies which fall within the normal/ mild category need to be analysed by a physiologist as automated scoring may lead to misdiagnosis and patients not being treated appropriately. Although there was a significant variance for studies that fell within the moderate category, this would have no impact on treatment and therefore these patients and those scored as severe, could be pre booked for CPAP issue and the study manually scored at a later date.

AHI	Median AHI (IQR) Software	Median AHI (IQR) Physiologist	P value
<5	2.10 (1.25 – 3.25)	3.10 (1.55 – 4.65)	0.03
5.1 - 15	8.90 (6.50 – 11.58)	11.10 (8.10 – 15.53)	0.0164
15.1 - 30	20.90 (17.90 – 24.15)	23.40 (21.00 – 29.00)	0.0034
>30	42.35 (34.95 – 57.85)	43.70 (35.50 – 63.30)	NS

Table 1 The difference between nocturnal automated scoring and physiologist scoring according to severity category

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DOES BORG SCORE, A SUBJECTIVE MEASURE OF BREATHLESSNESS RELATE TO OBJECTIVE MEASURES OF LUNG FUNCTION AND FUNCTIONAL EXERCISE CAPACITY; A PILOT STUDY.

Standeven, KE. Respiratory Department, Royal United Hospital NHS Foundation Trust, Bath, England; Newcastle University, Newcastle, England.

Aims: This pilot study investigated whether subjective Borg scores, using the rating of perceived exertion (RPE) scale, were correlated with objective measures of lung function or exercise capacity. Breathlessness or dyspnoea is a common feature in most respiratory disease. Managing this is an important part of minimising disease impact and maximising patient quality of life. The American Thoracic Society (ATS) Dyspnoea guidelines state that a patient's subjective rating of their breathlessness should be assessed at each clinic visit[1]. In recent years the number of 6MWTs with associated Borg score requested locally has increased. Evaluation may allow some modifications of protocols and reduce the test burden in terms of frequency and number to individual patients.

Methods: Retrospective data was collected from August to May 2014 for 100 patients (50 men and 50 women) at the Royal United Hospitals' Respiratory Lab in Bath. These were adult patients with any respiratory condition who had completed pulmonary function tests (PFTs) and a 6MWT on the same visit. The patient group in this study included known Pulmonary Hypertension (PH) and Rheumatology patients, including those with connective tissue disease and or Interstitial Lung Disease (ILD). All test results were obtained using local protocols based on national guidelines; Borg[3], 6MWT[2]. The combined dataset was analysed using Minitab statistical software. Scatterplots between Borg scores (Baseline, Post Exercise and Change) and objective data from lung function and 6MWT were generated to investigate relationships and Spearman's correlation coefficients (r) calculated. Histograms and unpaired t-test statistics were used to investigate male and female datasets to determine gender differences in Borg scores.

Results: Overall Borg scores showed no significant correlations to PFTs at $p \leq 0.0025$ (Bonferroni adjusted). Post exercise Borg correlated with six minute walk distance (6MWD) ($r=-0.344$, $p=0.000$). 6MWD itself correlated with several measures of lung function, Borg and heart rate (HR). No difference in mean Borg scores between genders was found.

Conclusions: Borg RPE did not correlate well with objective measures. However 6MWD did correlate strongly and this could be used to modify protocols. If lung function is stable it may not be necessary to repeat a 6MWT at every clinic visit. Breathlessness should be measured (1.) but a simpler scale such as the Borg CR10 or others may be easier to rate. The ATS 6MWT guideline recommends the CR10 scale (2.). The finding that Borg scores did not correlate well could itself be used to identify patients with particularly high Borgs compared with objective tests. These patients may benefit from some psychological intervention to minimise limitation to their daily activities and quality of life by their experience of breathlessness. These are all areas for future work.

References:

1. ATS Statement. Update on the mechanisms, assessment and management of dyspnea. Am J Respir Crit Care Med 2012; 185(4):435-452.
2. ATS Statement. Guidelines for the six-minute walk test. Am J Respir Crit Care Med 2002; 166:111-117.
3. Borg G. Borg 's Perceived exertion and pain scales. Human Kinetics 1998.

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AUDIT & REVIEW OF PATIENTS CURRENTLY UNDER THE RESPIRATORY INVESTIGATION DEPARTMENT FOR NOCTURNAL HYPOXIA, ON NOCTURNAL OXYGEN THERAPY

Butler, A., & Lloyd, J. Respiratory & Sleep Investigations Department, Good Hope Hospital, Sutton Coldfield, England.

Introduction:

Following the publication of the British Thoracic Society (BTS) guidelines for home oxygen in Adults (2015)[1], it was necessary to reassess the protocol used for prescription of nocturnal oxygen therapy (NOT) within our Home Oxygen Service. According to the 2015 guidelines, NOT administered to patients with Chronic Obstructive Pulmonary Disease (COPD) or Interstitial Lung Disease (ILD), without evidence of significant daytime hypoxia, shows no survival advantage or improvement in sleep quality.

Our current pathway for patients on NOT requires an annual review with overnight oximetry to confirm adequate oxygenation. However, this therapy is potentially no longer required and may be removed, and the overnight study is no longer required.

We therefore identified patients currently receiving this therapy, and produced a new pathway for removal. If removal is not possible alternative monitoring may be necessary.

Methods:

Following approval from the local research committee, data was gathered for all patients currently receiving NOT. The following parameters were recorded for each patient:

- Diagnosis at time of NOT initiation
- Route of referral
- Duration of NOT
- Is the patient on Ambulatory Oxygen?
- Is the patient on pressure support therapy (i.e. CPAP/NIV)?
- Any contra-indications for removing NOT.

This data was obtained from the patient's oxygen file held within the Respiratory & Sleep Investigation Department, and available Consultant letters and discharge summaries.

Results: A total of 36 patients were receiving NOT. 21 patients were also receiving Ambulatory Oxygen (AOT). The diagnoses were as follows: COPD: 24, Obstructive Sleep Apnoea: 8, Heart Failure: 4, ILD: 1, Bronchiectasis: 2, Other: 9. The length of therapy ranges from 0.5-5 years.

2 patients receive Non-invasive ventilation (NIV) and removal of NOT was not recommended. 4 patients receive CPAP therapy and may be candidates for NIV.

Currently patients on both AOT and NOT are seen in both Oxygen clinic and Sleep clinic. It is proposed that these patients receive follow up in Oxygen clinic only. This is the case for 19/36 patients.

The remaining 15 patients will continue follow up in Sleep Clinic. These patients will receive a blood gas and if they do not meet the criteria for Long Term Oxygen Therapy (LTOT) they will be given the option to have their NOT removed and be discharged from the Sleep Clinic.

Conclusions: An improved patient pathway has been developed. 34/36 patients, if not meeting the criteria for LTOT will be given the option to have their NOT removed. This will result in a reduction in the amount of appointments these patient's require and cost to the local Home oxygen service. A re-review is planned in 12 months' time to assess the impact the new pathway has on the patient's and service.

References:

1. British Thoracic Society. (2015). BTS Guidelines for Home Oxygen Use in Adults. Thorax. 70, 1-43.

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CASE STUDY: TRACHEAL STENOSIS

Fillingham, RC. Clinical Measurement Department, Royal Derby Hospital.

Introduction: A 67 year old male was transferred in from another hospital.

He had been involved in a serious road traffic collision 4 weeks earlier and had initially been intubated and ventilated at the scene of the accident and subsequently admitted to an Intensive Care Unit (ICU) in close proximity to the incident. He had sustained multiple injuries including bilateral rib fractures with a flail chest, bilateral pneumothoraces, left clavicle and scapula fractures and a left anterior circulation stroke. He remained on ICU for 11 days and required a mini-tracheostomy before being transferred to a trauma ward.

Four weeks after the initial accident he was transferred to his local hospital for rehabilitation.

Presentation: The patient became breathless and wheezy on the Rehabilitation ward and also complained of a non-productive cough. He gave a history of 'asthma' and had taken inhalers transiently about 4 years ago. He was initially prescribed a salbutamol nebulizer prn but his symptoms failed to improve and a formal respiratory opinion was sought. After the initial review by the Registrar, the patient was prescribed regular (6 hourly) salbutamol nebules and in addition was also started on oral prednisolone and amoxicillin. He however failed to improve and a senior opinion was sought.

Management: Following a Consultant review, an urgent CT of neck and chest and flow-volume loop to exclude upper airway obstruction were requested. The flow-volume loop, performed the same day, showed severe expiratory and inspiratory flow limitation consistent with extra thoracic obstruction (see figure 1).

An urgent CT scan was attempted but was unsuccessful as the patient was too breathless to lie flat. The patient subsequently suffered a respiratory arrest, was successfully resuscitated and sedated and intubated for the procedure (CT neck and chest) and transferred to ICU.

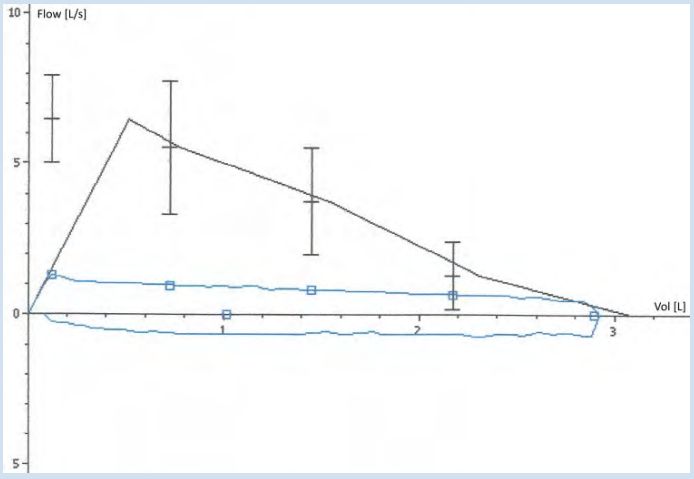
The CT scan demonstrated "tracheal stenosis with 4-5mm subglottic trachea at T 1 level which looks to be cartilaginous destruction".

Outcome: The patient was urgently transferred to a thoracic surgical centre and underwent successful corrective laser ablation of the stenosis.

Discussion: Tracheal stenosis is a rare complication of intubation but it can occur in a critically ill patient requiring prolonged intubation[1]. This is only the second case of tracheal stenosis as a result of intubation I have been involved with in 28 years of working as a Respiratory Physiologist. The case demonstrates the importance of a holistic approach to our patients' presenting symptoms.

References:

1. Stauffer J, Olson D, Petty T. Complications and consequences of endotracheal intubation and tracheostomy. A prospective study of 150 critically ill adult patients. Am JMed 1981;70:65-76.



	Obs	Pred	%Pred	SR
VC MAX	2.89	3.22	89.7	-0.79
FVC	2.89	3.08	93.9	-0.44
FEV 1	1.02	2.60	39.1	-4.18
FEV1%	35.15	76.37	46.0	-6.35
PEF	1.27	6.45	19.7	-5.77
MMEF	0.79	2.82	28.0	-2.39

Figure 1: Flow-volume loop

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NON-ATTENDANCE AT CPAP FOLLOW UP CLINICS FOR PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA

Hall, A. Clinical Measurement Department, Royal Derby Hospital

Introduction: Non-attendance at scheduled healthcare appointments poses a significant financial cost to the NHS. For patients with obstructive sleep apnoea (OSA) missed appointments also result in inadequate monitoring of compliance with continuous positive airway pressure (CPAP) and the effectiveness of the therapy. Non-attendance for annual review in the CPAP clinic at the Royal Derby Hospital is high. This study investigated factors that influence the non-attendance of patients with OSA at CPAP follow up clinics.

Methods: A two month retrospective review of data for 261 adult patients scheduled to attend for routine follow up in the CPAP clinic was conducted. Patients were categorised into 'Attenders' and 'Non-attenders'. Age, gender, disease severity at diagnosis, compliance with CPAP at the last visit, the length of time on CPAP and the number of previous missed appointments were recorded. Comparisons between groups were performed using an independent t-test (continuous variables) or a Pearson chi-square test (categorical variables). Variables that achieved significance in the univariate analyses were entered into logistic regression analysis, with non-attendance as the dependent variable.

Results: The non-attendance rate during the study period was 22.6%. Non-attenders were younger, had missed more scheduled appointments and had poorer compliance with CPAP. Gender, disease severity at diagnosis and length of time on CPAP did not differ significantly between attenders and non-attenders (Table 1). Multivariate analysis demonstrated that younger age (odds ratio 0.96 [95% CI 0.93-0.99]), a greater number of missed appointments (1.53 [1.30-1.80]) and CPAP compliance of <4 hours/night (2.51 [1.19-5.32]) were all significant independent predictors of non-attendance.

Conclusion: Almost a quarter of patients failed to attend their routine follow up appointment in the CPAP clinic. Strategies to improve attendance should focus on optimising compliance with CPAP and reducing barriers to attendance for younger patients and those with a history of missing appointments.

	Attenders	Non-attenders	p-value
Age	*(n = 202)*	*(n = 59)*	
mean years (95% CI)	59.2 (57.7-60.7)	50.4 (47.4-53.4)	<0.001
Gender	*(n = 202)*	*(n = 59)*	
% male (95% CI)	79.7 (74.2-85.2)	69.5 (57.8-81.2)	0.099
Previous missed appointments	*(n = 202)*	*(n = 59)*	
mean number (95% CI)	0.9 (0.7-1.1)	3.3 (2.6-4.0)	<0.001
Disease severity at diagnosis	*(n = 144)*	*(n = 48)*	
mean ODI/AHI (95% CI)	36.0 (31.5-40.5)	33.8 (26.7-40.9)	0.618
Compliance with CPAP at last visit	*(n = 197)*	*(n = 57)*	
% ≥4 hours/night (95% CI)	82.7 (77.4-88.0)	57.9 (45.1-70.7)	<0.001
Length of time on CPAP	*(n = 190)*	*(n = 56)*	
mean years (95% CI)	5.3 (4.8-5.8)	4.4 (3.6-5.2)	0.062

ODI: oxygen desaturation index, AHI: apnoea hypopnoea index

Table 1. Patient characteristics for attenders and non-attenders

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THE RELATIONSHIP BETWEEN THE INCREMENTAL SHUTTLE WALK TEST AND THE INCREMENTAL CYCLE ERGOMETRY TEST IN INTERSTITIAL PULMONARY FIBROSIS.

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Background:

Interstitial Pulmonary Fibrosis (IPF) is a chronic progressive lung disorder with more cases being diagnosed each year. The Cardio Pulmonary Exercise Test (CPET) is a gold standard exercise test now being increasing used to assess patient's functional capacity as it has important implications on survival rates and health related quality of life. The Incremental Shuttle Walk Test (ISWT) is a validated incremental walking test for Chronic Obstructive Pulmonary Disease, but not for IPF. This study examines the relationship between the performance on the ISWT and the VO_2 peak during a CPET in patients with IPF

Methods:

43 patients performed full lung function test and an ISWT during visit1 and a CPET during visit 2, which was separated by 1 week. Heart rate was noted pre and post both tests.

Results:

There was a significant correlation found between the distance walked during an ISWT (310m) and VO_2 peak during an CPET (14.19ml/Kg), (r=0.54 p=0.0002). There was also a significant correlation found between TLco (3.60 mmol/min/kPa) and the ISWT distance (r=0.30 p=0.0497). A significant difference was found between resting and peak heart rate between the ISWT distance and the CPET, however a strong correlation was found between the two. No other significant correlations were found between any other parameter and the ISWT or the CPET.

Conclusion – The ISWT is a valid, cheap and standardised externally paced incremental exercise test that stresses a patient to a symptom limiting maximal exercise performance and can be used to assess the functional capacity in patient with IPF.

References:

1. American Thoracic Society. 2011. An official ATS/ ERS/JRS/ALAT Statement: Interstitial Pulmonary Fibrosis: evidence-based guidelines for diagnosis and management. American Journal Critical Care Medicine; 183: 788-824.
2. Singh S, Morgan M et al. 1994. Comparison of oxygen uptake during a conventional treadmill test and the shuttle walk test in chronic airflow limitation. Eur Respir J; 7: 2016-2020.

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EARLY DETECTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN PRIMARY CARE

Rasheda Choudhury, Adult Respiratory Care and Rehabilitation (ARCaRe)

Introduction: Chronic Obstructive Pulmonary Disease (COPD) is a disease of the lungs characterised by airflow obstruction, which is treatable but not curable. It is expected that in 2020, COPD will be the third main cause of death worldwide and 15% are only diagnosed when they present to hospital as an emergency; early diagnosis and treatment of COPD can substantially slow the decline in lung function, which in turn can prolong survival in people with COPD[1].

The Outcome Strategy for COPD published by the Department of Health states that 'it is important that COPD is recognised within the community in a cost-effective and efficient manner'. Patients should be identified as a case finding programme through GP registers using NICE guideline, where diagnosis of COPD should be considered in people over the age of 35 who have a risk factor, such as smoking history or exposure to harmful fumes, dusts or chemicals, and who present with exertional breathlessness, chronic cough, regular sputum production, frequent winter 'bronchitis' or wheeze[2] by performing quality-assured diagnostic spirometry with bronchodilator treatment to assess the degree of reversibility of the airways.

Aim: This study investigates the severity of COPD, as classified by NICE 2010, in patients at time of initial diagnosis performed at the Royal London Hospital referred from the community GP practices.

Method: 36 GP Practices in Tower Hamlets refer patients to the initial diagnostic clinic at the Royal London Hospital (RLH). Patients were offered an appointment within 4 weeks of referral at the clinic. Spirometry reports of patients referred from their GP practices to the clinic at RLH were selected from 21 weeks (May to September 2015).

All patient referrals met the NICE 2010 criteria for the diagnosis of COPD and quality-assured spirometry was performed in accordance to ARTP Standards and classification based on NICE 2010 Clinical Guidelines for COPD; $FEV_1/FVC < 0.7$, FEV_1 >80% mild, FEV_1 50-70% moderate, FEV_1 30-50% severe, FEV_1<30% very severe.

Only results that met BTS quality criteria were included in the study and results that showed significant reversibility (>400ml increase in FEV_1 from pre to post values, ARTP) and confirmed asthma were excluded from the study.

Results of very severe COPD were seen in diagnosed patients, which attended for their annual review, hence were also excluded from the study.

Results: A total of 260 spirometry reports were analysed and the prevalence of normal spirometry was 62% (n=162), restrictive spirometry was 8% (n=22), a mixed restrictive and obstructive pattern was seen in 1% (n=2) of patients and COPD in 29% (n=74).

COPD was classified as mild obstruction in 53% (n=39), moderate in 31% (n=23) and severe in 16% (n=12) according to the NICE 2010 classification.

Conclusion: The results demonstrate that 16% of patients referred to the initial diagnostic clinic present with severe airway obstruction; this is similar to 15% who present to hospital as an emergency with no diagnosis. If these patients were identified earlier, effective intervention and management could potentially reduce emergency admissions, which could reduce the cost to the NHS as well as improve patients' quality of life.

References:

1. An Outcome Strategy for COPD and Asthma: NHS Companion Document, Department of Health, May 2012

2. NICE. Chronic Obstructive Pulmonary Disease:

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PROVIDING OBSTRUCTIVE SLEEP APNOEA (OSA) DIAGNOSTICS AND CPAP SUPPORT FOR PATIENTS IN PRISON

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Respiratory Physiology and Sleep Department, University Hospitals Coventry and Warwickshire NHS Trust.

UHCW NHS Trust has a successful sleep service which assesses, diagnoses and treats patients with OSA. Patients are referred to the service from the Coventry and Rugby area as well as neighbouring counties. Within the Coventry and Rugby area is a Category B Prison which holds male sex offender prisoners aged over 21 years. The Prison holds a maximum of 625 prisoners, 20% of whom are serving a life sentence.

In February 2015, Prison staff telephoned the department concerning a patient who we issued with CPAP the previous year. Discussion with the Prison Healthcare Manager identified that there were five other prisoners using CPAP machines without any clinical support.

The Respiratory Physiology and Sleep Department at UHCW NHS Trust prides it self in providing optimal patient care and it was felt that the prisoners should receive an equivalent health and wellbeing service to that available to other patients. This sentiment is supported by the National Partnership Agreement between the National Offender Management Service, NHS England and Public Health England[1].

In March 2015 it was agreed that the prison Healthcare Manager would attend the department with the prisoner's CPAP machines, allowing review and compliance data checks. This was preferable to arranging for the prisoners to attend the hospital as outpatients as Category B prisoner requires a prison escort. The prisoners had been issued CPAP therapy from hospitals all over the country but many had been lost to follow up. Generally data showed compliance with CPAP was good, however the interfaces were in a poor condition. The machines were in good working order and the prisoners reported very few problems. Common problems reported were poor mask fit/leak due to their poor condition, and therefore new masks, tubing and machine filters were issued.

The service was well received by the Prison Service and prisoners but it did not give the prisoners the face-to-face appointment they would usually get. The prison already had specialists such as a dentist, an optician and a chiropodist attending clinics within the prison setting so it was decided that a CPAP review clinic would be arranged.

In September 2015 the first joint UHCW/Prison CPAP review clinic was held. Two senior physiologists saw seven prisoners over one morning. The feedback was positive from the prisoners with and we received comments that the prisoners were happy with the clinic. The prison healthcare team were pleased with the outcome as they feel the wellbeing of prisoners is highly important.

The Respiratory Physiology and Sleep Department felt the clinic was successful. From a logistical point of view the way the rooms in the department are set up makes it difficult to see the prisoners in a private setting without disrupting other clinics. The clinic was funded as outpatient attendance tariff and, apart from travel expenses, the clinic costs were no more than if the clinic had been in a hospital setting.

Due the success of the clinic, it has been agreed to hold clinics every 6 months and we are currently working on a process where sleep studies can be performed at the prison. There are other prisons in the area and we will be contacting them to offer a similar service for them.

1. https://www.gov.uk/guidance/healthcare-for-offenders

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STRAIGHTEN UP AND FLY RIGHT – AN INVESTIGATION INTO HYPOXIC CHALLENGE TESTING AND PROVIDING INFLIGHT OXYGEN

Lesser, I and Wilkins, K. Heart and Chest Clinic; Southend University Hospital (SUH), Southend, England.

Introduction:

Hypoxic challenge tests (HCT) assess the need for inflight oxygen however research is limited surrounding this and formal guidelines are yet to be published.

Lack of standardization for HCT prompted us to review our service, looking specifically at methods, costing and effectiveness of results.

Method: Quotes were obtained from NHS suppliers (n=4) including BOC, who currently supply the majority of medical gas to SUH.

NHS hospitals (n= 19) were surveyed, enquiring which method they use for HCT and if they currently charge patients for this test.

Data was collected retrospectively from results obtained at SUH from 1st January 2014 until October 2015 (n= 37). Data collected included: test criteria, result summary, referrer speciality, if patients flew or not and if O_2 was used.

Results: Data shows that 100% Nitrogen is 88% cheaper than 15% O_2 special mix currently used. The disposables needed for the Venturi method are 18% cheaper than those needed for the reservoir bag method currently used.

17 of the19 hospitals replied and results showed that 76.5%, (13 hospitals) are using 100% nitrogen with a Venturi mask and 23.5% (4 hospitals) are using 15% O_2/ nitrogen with either a Douglas or reservoir bag. The survey showed 23.5% of hospitals are charging for this test

Results of HCT performed at SUH were reviewed (n= 37) and 53.1% (n=17) of which were positive. Of the positive tests, 41.1% (n= 7), decided not to fly, thus 58.9% (n=10) did use air travel. It was found that of those positive HCT patients that flew, 60% (n= 6) did not use inflight O_2, despite the test indicating a clinical need to.

Conclusion: The 100% Nitrogen and Venturi method is both cheaper and more commonly used across the UK. Retrospective data collected from HCT results show that despite a positive test, some patients are still flying without O2, leading us to question the usefulness of this test. Some hospitals argued that charging patients for this test encourages them to take results seriously.

It is clear that further research is needed to better standardise the HCT; benefiting both clinicians and airlines when arranging inflight oxygen. There is no current national tariff when it comes to costing meaning hospitals are either coming to a local negotiation or including costs with the outpatient tariff.

Published formal guidelines would benefit clinicians performing the test; standardizing methods, costing and interpretation of results. This in turn benefits patient care. By changing the method currently used by SUH to 100% nitrogen and Venturi mask method the trust would be saving money and improving patient comfort. This audit shows that the service offered would be greatly enhanced by a simple change in testing method.

Results from this audit prompted SUH into discussing methods and service provisions of this test.

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THE IMPACT OF GAS ANALYSIS TECHNIQUE ON THE MEASUREMENT OF SINGLE BREATH GAS TRANSFER (TL_{CO}).

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Traditionally TL_{CO} has been measured using slow responding gas analysers and an assumed washout volume. Recent introduction of rapid gas analysers allows more accurate determination of washout volume through continuous analysis of expired gas, which is of particular benefit in patients with small vital capacities.

We assessed the impact of a change in methodology using serial measurements in a cohort of patients diagnosed with interstitial lung disease (ILD) (n = 53) and in healthy controls (n = 12).

TL_{CO} measurements obtained using the traditional assumed washout technique on a CareFusion Masterscreen PFT system (TL_{CO}CF) were compared with measurements via rapid gas analysis on a Medical Graphics Ultimo PF system (TL_{CO}MG). All tests were performed according to ARTP/BTS Guidelines.

There was no significant differences in normal controls. However, gas transfer measurements in ILD patients were significantly higher when measured using the rapid gas analysis technique (Table 1).

In conclusion, caution should be used when comparing TL_{CO} results using CH_4 with results obtained using He for monitoring purposes. In addition current TL_{CO} regression equations developed using helium may not be appropriate for modern rapid gas systems.

	Care Fusion Median (IQR)	MedGraphics Median (IQR)
TL_{CO} (mmol/min/kPa)	4.45 (3.39 – 6.02)	4.82 (4.00 - 6.44)*
K_{CO} (mmol/min/L/kPa)	1.21 (0.97 – 1.40)	1.28 (1.05 – 1.52)*
VA (L)	3.85 (3.18 – 4.62)	4.05 (3.41 – 4.82)*

* = p <0.001

Table 1. Influence of technique on gas transfer measurements in ILD patients.

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STUDY COMPARING MEASUREMENTS OF MAXIMAL INSPIRATORY PRESSURE AND MAXIMAL EXPIRATORY PRESSURE IN NORMAL SUBJECTS USING TWO DIFFERENT DEVICES AND ALTERNATIVE MOUTHPIECES AT TOTAL LUNG CAPACITY (TLC) AND RESIDUAL VOLUME (RV)

Jennifer Troath University Supervisor: Jacqueline Laverty
Clinical Based Supervisor: Peter Moxon

INTRODUCTION: Respiratory muscle strength can be evaluated by assessing the maximal inspiratory pressure ($P_i$max) and the maximal expiratory pressure ($P_e$max). $P_i$max is the greatest subatmospheric pressure that can be generated during inspiration against an occluded airway; $P_e$max is the highest pressure that can be developed during a forceful expiratory effort against an occluded airway[4].Appropriate evaluation of respiratory muscle strength may provide insight into unexplained dyspnoea, cough and as an outcome measure for many disorders including neurological or muscular diseases that affect respiratory muscle function[7].

OBJECTIVES: To compare measurements of $P_i$max and $P_e$max obtained in normal healthy subjects using a handheld MicromedRPM[3] (MR) to the measurements obtained using Medgraphics Body Plethysmography Elite Platinum Series[5] (PE) and to identify any variability between the two devices and alternative mouthpieces.

METHODS: Thirty normal healthy staff (13 ♂ 17♀) from New Cross Hospital were measured using the two devices with alternative mouthpieces. $P_i$max was measured at RV and $P_e$max at TLC and the manoeuvre was repeated five times until two identical readings were obtained. Questionnaires assessed which equipment and mouthpieces were favoured. Spirometry was performed prior to measurement to exclude subjects with reduced lung function. Results were compared by paired t-test and Pearson's correlation coefficient[2].

RESULTS & DISCUSSION: Data obtained (Figure 1) shows no significant difference in $P_i$max and $P_e$max between the devices with two alternative mouthpieces. 57% of the subjects preferred MR due to ease of use. The PE required subjects to sit in the "box" and some did not like sitting in a confined space, thought the equipment looked intimidating, or were uncomfortable during the shutter closure. The flanged rubber mouthpiece was preferred (40% for soft blue -PE, 43% Rubber Flanged - MR) similar to as described previously[1] although the PE mouthpiece is larger than the MR. Koulouris et al[6] suggested a flanged mouthpiece is universally applicable in clinical assessment of respiratory muscle strength; therefore either flanged mouthpiece used here will be suitable for clinical use. The results support Dimitriadis et al[4] to suggest the Handheld Micromed RPM is the preferred choice for measurement of respiratory mouth pressures.

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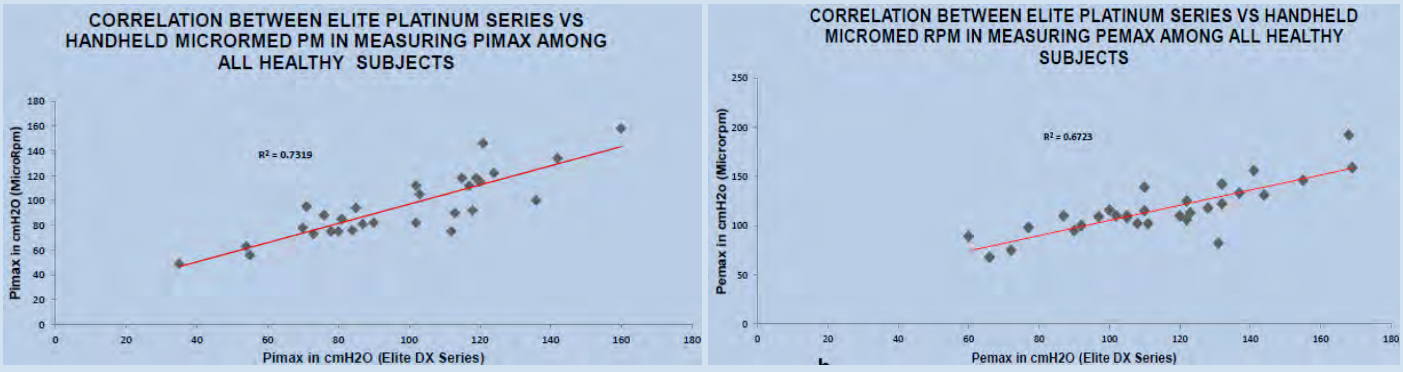

Figure 1: Scatter graphs explaining correlation between Elite Platinum Series and Handheld MicroMed RPM in measuring P_IMAX (left) and P_EMAX (right) in all subjects

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PULSE OXIMETRY IN SLEEP DIAGNOSTICS: A COMPARISON BETWEEN DEVICES AT EITHER END OF THE COST SPECTRUM

A Byrne, P. Coss, M. Varghese, A. Martin - Department of Respiratory Medicine, St. James's Hospital, Dublin 8.

Pulse Oximeters are available for purchase in the non-clinical market in the absence of any minimum standards or purchasing guidelines. For example, the British Hypertension Society publishes a list of approved blood pressure monitors for use in the home setting.

SpO_2 during 'spot checks' and the Oxygen Desaturation Index (ODI) from an oximeter purchased on eBay were compared simultaneously with hospital oximeters in a variety of clinical settings including: in-house Polysomnography (PSG) & home overnight oximetry (HO). Bland & Altman analysis (BA) was then performed.

The ebay wrist Oximeter (including analysis software and internal memory) cost 7% of the equivalent hospital oximeter in the study. Table 1 summarises the BA analysis:

The results suggest a clinically significant difference in SpO_2 and ODI between the 'eBay' Oximeter and the hospital standard. The limits of agreement in all study conditions are wide so the results are ambiguous from the trial oximeter. This study suggests the need for purchasing guidelines and minimum standards for pulse oximeters in the non-clinical marketplace.

n=76	Spot Check SpO_2	HO (ODI)	PSG (ODI @ 4%)	PSG (ODI @ 3%)
Bias (%)	1.3	1.4	0.04	0.98
Limits of Agreement (+)	3.3	9.7	15.6	20.1
Limits of Agreement (-)	0.8	6.8	15.5	18.2

Table 1. Bland & Altman analysis

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A RETROSPECTIVE OBSERVATIONAL STUDY OF CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) COMPLIANCE RATES

D.A. Price[1], J. Furlong[1], M.A. Shaw[1], D. Marple-Horvat[2], J. Hadcroft[1]

Liverpool Heart & Chest Hospital1, Manchester Metropolitan University2

Aim:

Recent studies have shown that asymptomatic patients are significantly less likely to comply with CPAP therapy when compared to symptomatic patients. We set out to test whether this was true in our patient population.

Methods:

Between December 2010 and November 2013, 238 patients referred to our institution with a diagnosis of obstructive sleep apnoea were divided into two study groups. Patients were put into the 'symptomatic' group (n=84) if they scored ≥ 11 on the Epworth Sleepiness Scale (ESS), and into the 'asymptomatic' group (n=154) if they scored ≤ 10 but their history suggested that their symptoms were more significant. All patients were then treated with the same CPAP therapy strategy. Data including compliance rates (defined as >4hrs use for 70% of the observed nights) and ESS scores were collected at diagnosis, and at 2 weeks, 3 months and 6 months follow-up, then analysed according to group membership.

Results:

At 6 months, 170 patients remained in the study, dropout rates were slightly higher in the 'symptomatic' group, 30.5% (n=107) vs. 25.0% (n=63), but this was not statistically significant (p=0.37). Compliance rates between the 'symptomatic' group and the 'asymptomatic' group at each of the study stages were as follows: at 2 weeks 57.6% vs. 58.6% (p=0.89), at 3 months 67.0% vs. 64.6% (p=0.75) and at 6 months 71.0% vs. 69.8% (p=0.87).

Conclusions:

Although it is generally accepted that compliance rates are much lower in 'asymptomatic' patients, this study suggests that ESS should not be used in isolation to predict compliance rates. CPAP should still be offered to patients with sleep apnoea if their symptoms suggest they have the syndrome, even in the absence of a high ESS score.

References:

American Academy of Sleep Medicine (2007). The International Classification of Sleep Disorders. Updated 2013.

Barbé F, Mayoralas L.R, Duran J, Masa J.F, Maimó A, Montserrat J.M. et al. (2001) Treatment with continuous positive airway pressure is not effective in patients with

	OSAHS	OSA	p-value
Diagnosis	154	84	-
2 Week Follow-up	139 / 154	70 / 84	0.12
3 Month Follow-up	115 / 154	65 / 84	0.64
6 Month Follow-up	107 / 154	63 / 84	0.37

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SCORING RESPIRATORY SLEEP STUDIES FOR OBSTRUCTIVE SLEEP APNOEA (OSA). A COMPARISON STUDY BETWEEN AUTOMATED SOFTWARE AND CLINICAL PHYSIOLOGISTS.

J. Furlong

Liverpool Heart & Chest Hospital

Introduction: Obstructive Sleep Apnoea (OSA) is a sleep disorder estimated to affect 4% of men and 2% of women[1]. It is characterised by pauses or reductions in ventilation; due to collapse, or partial collapse of the upper airway. Accurate diagnosis is vital as the severity of OSA determines treatment and also a patient's legal obligations regarding driving. Diagnosis is generally aided by an overnight sleep study. Respiratory Sleep Studies are analysed by software and an automated report can be produced. However this is not recommended [2] and scoring is generally done manually.

Aims: Multi-channel sleep equipment such as that used at Liverpool Heart and Chest Hospital has an automated scoring system. Scoring of studies is done by a number of physiologists, of different skills and experience. Scoring a sleep study manually can involve an element of subjectivity on the part of the scorer. The aim of this study was therefore to look at the similarity of automated and manual scoring and also at the similarity of scoring between physiologists with different levels of knowledge/ experience. The justification for this research is: the time taken to manually score a multi-channel sleep study can vary depending on the quality of the recording and the severity of the results. Typically it can take between 1 and 4 hours to analyse and report 1 study. In a hospital that performs 700 studies per year this is a lot of Physiologist's time (at a high grade), which may be hard to justify if automated scoring provided statistically similar results. If manual scoring proves necessary then it should be proven that whoever reports the study, the results, and so the outcome/diagnosis will be the same. This also validates training programmes for those in the department learning how to analyse/report sleep studies.

Method: As part of a quality control programme, one sleep study per month is analysed by all Clinical Physiologists to ensure results are similar. The results for two of the physiologists over 24 months were compared and one physiologist's results were compared to the automated scoring system (Philips Respironics). Parameters were compared using paired t-tests.

Results: Results between Physiologists were significantly similar across all parameters suggesting the Physiologist scoring the test will not influence the results if they are following the correct guidelines for scoring desaturations, apnoeas and hypopnoea (Table 1). Results between Physiologist and automated scoring found significant differences across all parameters except from one (Obstructive Apnoeas).

Conclusions: The current practice of manually scoring all sleep studies appears to be validated by this study.

References:

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Physiologist v Physiologist	P Value	Significance
AHI	0.759	P<0.05
ODI	0.140	P<0.05
OA	0.298	P<0.05
MA	0.228	P<0.05
CA	0.089	P<0.05
HYPOP	0.366	P<0.05
Automated v Physiologist	P Value	Significance
AHI	0.0000197	P<0.05
ODI	0.001609	P<0.05
OA	0.671	P<0.05
MA	0.034	P<0.05
CA	0.021	P<0.05
HYPOP	0.0000015	P<0.05

Table 1. The comparison between physiologists and with automated scoring

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IDIOPATHIC CHRONIC COUGH; A PATIENT'S JOURNEY

Williams, N; Birring, S. Chest Unit, Kings College Hospital, London, England.

Introduction:

Cough is one of the most common reasons why patients consult with their GP[1]. Although it can be a symptom related to many respiratory conditions, cough can be the diagnosis. A chronic cough is a cough lasting more than eight weeks; it can cause symptoms such as pain and incontinence which can cause considerable physical and psychological morbidity[1, 2]. There can be many causes of chronic cough including postnasal drip and acid reflux from the stomach, however when the cause is unknown (idiopathic) the journey that a patient experiences can be a very long and frustrating one. This case study looks at one patient's journey and how diagnosis and treatment has essentially changed her life.

Case presentation:

A 42 year old female patient was referred to Kings College London with a persistent cough for more than two years. She had never smoked and had a background of depression. When seen in Clinic, she had been off sick for over ten weeks due to her coughing. Residing in Cambridge, she had a range of diagnostic tests at her local hospital as well as much further afield involving extensive travel costs. Diagnostics tests performed included chest x-ray, CT scan, spirometry, lung volumes, transfer factor, bronchoscopy, oesophageal physiology studies, IgE and RAST studies; all of which were unremarkable. She had also trialled a number of steroids, bronchodilators, antibiotics as well as physiotherapy to try and suppress the cough; all without effect. This had a profound effect on her quality of life with the patient scoring considerably low on quality of life assessments including the Leicester Cough Questionnaire (LCQ). At King's College hospital, the patient wore a cough monitor for a 24-hour period which identified that this patient was coughing more than 20 times per hour. There appeared to be no underlying cause therefore patient was diagnosed with chronic cough.

Management and Outcome:

The patient was prescribed Gabapentin; a centrally acting neuromodulator drug that is widely used for neuropathic pain. Commencing on a dose of 600mgs three times daily, the patient started a trial of Gabapentin in June 2014. Reviews conducted saw the patient suffering from a few side effects including mild dizziness and fatigue but the cough was controlled. The dose of Gabapentin was reduced to minimise side effects over the following months and consequently the patient was able to return to full-time work, was socialising and 'enjoying life' again.

Discussion:

There is much to be done in regards to chronic cough. King's College Hospital is one of only five specialist cough clinics in the UK that participate in many clinical trials. It is important that research continues to establish new or more effective treatments of chronic cough. Furthermore education is of equal importance; both to clinicians – in order to identify those with idiopathic chronic cough and to patients, so they can self-help and maintain a good quality of life.

References:

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PHYSIOLOGICAL RESPONSE TO EXERCISE IN AN ADULT CYSTIC FIBROSIS POPULATION: INVESTIGATING THE RELATIONSHIP BETWEEN HRR AT ANAEROBIC THRESHOLD AND FEV1% PREDICTED

Comber. G. Respiratory Centre, New Cross Hospital, Wolverhampton, United Kingdom

Method:

Cystic Fibrosis (CF) is an autosomal, recessive disease characterised by a mutation or dysfunction. Patients suffer a number of complications caused by poor sodium and chloride transport across cell membranes leading to viscous secretions. The disease is life limiting and around 85% of these early deaths are a result of respiratory failure with the most accurate prognosis marker being maximum volume of oxygen utilisation (VO_2 max). This parameter is affected by a number of factors and can be increased or preserved through correct exercise prescription. For maximal benefits exercise should be targeted around anaerobic threshold however this is not easily identifiable during regular activities.

15 patients with CF underwent Cardiopulmonary exercise testing (CPET) to establish whether there was a significant correlation between Forced Expiratory Volume in one second percent predicted (FEV_1%) and Heart Rate Reserve (HRR) at Anaerobic Threshold (AT) as a method of giving an easily monitored parameter (Heart Rate) as a target during exercise, for a given severity of lung disease, to gain maximal benefits from the activity.

Results:

The correlation between FEV1% and HRR at AT was found to be very weak, r (13) = 0.269, p>0.05 however there was a strong correlation between FEV1% and Maximum volume of utilised oxygen percent Predicted (VO2 max %), r (13) = 0.601, p<0.05.

Conclusion:

This study shows that FEV1% can not be used as a predictor of HRR at AT, however the lack of correlation does show a narrow window for HRR in which patients with CF should aim in order to exercise near AT and ultimately improve their fitness and prognosis.

The strong correlation between FEV1% and VO2 max % serves a great purpose in the that prognosis and 5 year mortality risk can be estimated from a lung function test widely available and frequently performed as opposed to CPET which is only available in specialist centres.

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DOES THE GENDER AGE PHYSIOLOGY INDEX PREDICT THE RISK OF MORTALITY MORE ACCURATELY THAN COMPOSITE PHYSIOLOGIC INDEX IN IDIOPATHIC PULMONARY FIBROSIS? HOW THE ANALYSIS CAN BE AFFECTED BY THE USE OF DIFFERENT REFERENCE VALUES TO CALCULATE THE LUNG FUNCTION PARAMETERS IN THESE SCORES

Taylor Gonzalez, A. [1]; Maher, T. [1] Respiratory Biomedical Research Unit 1, Royal Brompton Hospital, Fulham Road, London, SW3 6HP

Aim: The Gender (G), Age (A) and Physiology (P) GAP index and Composite Physiologic Index (CPI) have been developed as a prognostic tool to help guide management decisions for patients with Idiopathic Pulmonary Fibrosis (IPF). There has never been a comparison of the two indexes as to which will predict survival in a cohort of patients with IPF and there is often no clarity as to which reference values are used to derive the lung function measurement used in the calculation of these scores.

Methods: 209 patients with IPF aged 40 and over were enrolled in to a prospective cohort study at a specialist tertiary referral centre. Forced Vital Capacity (FVC), CPI and GAP Index scores were calculated using the Global Lung Initiative (GLI) and European Community for Coal and Steel (ECCS) reference values for spirometry and ECCS and Miller reference ranges for transfer factor (TL_{CO}).

Results: Paired t-tests for continuous variables showed statistically different outputs for all parameters comparing ECCS with GLI for FEV_1 ($p<0.0001$) and FVC ($p<0.0001$), CPI ($p<0.0001$), Miller for TL_{CO} ($p<0.0001$) and Wilcoxon Matched Pairs showed significant different outputs for GAP Score ($p=0.0193$).

Calculation of the C-Statistic, represents the area under the receiver operating characteristic (ROC) curve, found TL_{CO} to have the best discriminatory power to determine death (C=0.7518), followed by FVC (C=0.6765), FEV_1 (C=0.6522) and age (C=0.5795).

Cox proportional hazards model determined TL_{CO} to be the only statistically significant variable to predict mortality in each model tested. The most powerful model for determining risk of mortality was Age-FVC-TL_{CO} Model (C = 0.7629).

Cox proportional hazard regression analysis for calculation of hazard ratios (HR) showed TL_{CO} to be the biggest predictor of mortality (TL_{CO} <35% compared to TL_{CO} >55%) HR = 13.1 (95% CI, 5.11-33.58), followed by FVC (FVC <55% compared to FVC >75%) HR = 4.41 (95% CI, 2.39 – 8.10). HR for CPI (>60 compared to CPI <40) = 3.90 (95% CI, 1.93 – 7.87) and GAP (Stage 3 compared to Stage 1) HR 5.94 (95% CI, 3.03 – 11.64).

Conclusions: Univariate analysis demonstrated that age and gender variables, the only distinguishable features of GAP, offer the least value as a prognostic tool. Thus FVC, TL_{CO} and CPI we have determined are the most important tools for discerning risk in the patient and should be used to determine eligibility for access to treatments on the NHS.

Future research in to staging models and mortality using

Difference in Calculation of Lung Function Parameters			
Parameter	**Mean Difference**	**95% Confidence Interval**	**P value**
FEV_1	-3.46 %	-3.95 to -2.98 %	P < 0.0001
FVC	-4.74 %	-5.32 to -4.15 %	P < 0.0001
TL_{CO}	0.76 %	0.43 to 1.08 %	P < 0.0001
CPI	0.77	0.47 to 1.07	P < 0.0001
GAP Score	----------	----------	P = 0.0193

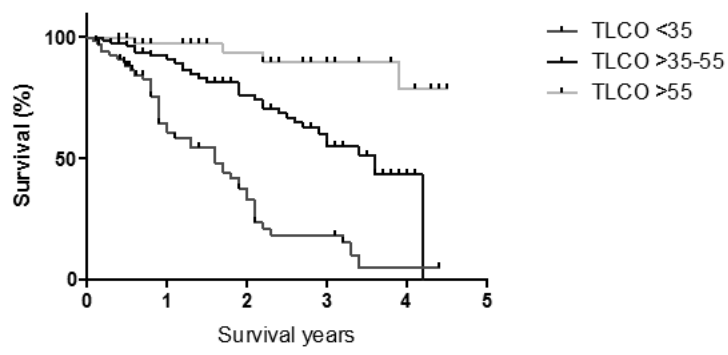

Figure 1- Kaplan Meier survival of cohort from baseline TL_{CO}

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IS IT FEASIBLE FOR RESPIRATORY PHYSIOLOGISTS TO CARRY OUT INHALER DEVICE TECHNIQUE CHECKS IN ASTHMA AND COPD PATIENTS?

R. Anglin, P. Byrne, G. Nolan.

Pulmonary Laboratory, St Vincent's University Hospital, Dublin 4

Studies have shown that many patients are using their inhalers incorrectly[1]. It is recommended that patients should have inhaler device technique checks at every contact with a healthcare professional[2].

A six week pilot study was carried out on COPD and asthma patients attending for Pulmonary Function Tests (PFTs). Inhaler device technique was assessed using standardised checklists and patients viewed relevant educational videos if poor technique was demonstrated.

Sixty nine patients were surveyed with a mean age of 62 years. 85% were taking inhalers for more than a year and 59/69 (86%) had two or more inhaler device types. 90% had been shown how to use their inhalers initially by a health care professional but only 38% had inhaler device technique checks since.

36 patients had their inhaler device technique checked, 12 demonstrating poor technique. These patients were shown an educational video and 67% demonstrated good inhaler device technique when rechecked. The remaining four patients required further inhaler education and were referred to the Respiratory Nurse Specialist.

The mean time taken to perform inhaler device technique checks with video was 8 minutes (range 4-10 minutes).

Respiratory Physiologists can provide a relevant "moment" of inhaler technique checks during PFTs. A national standardised protocol is currently under development.

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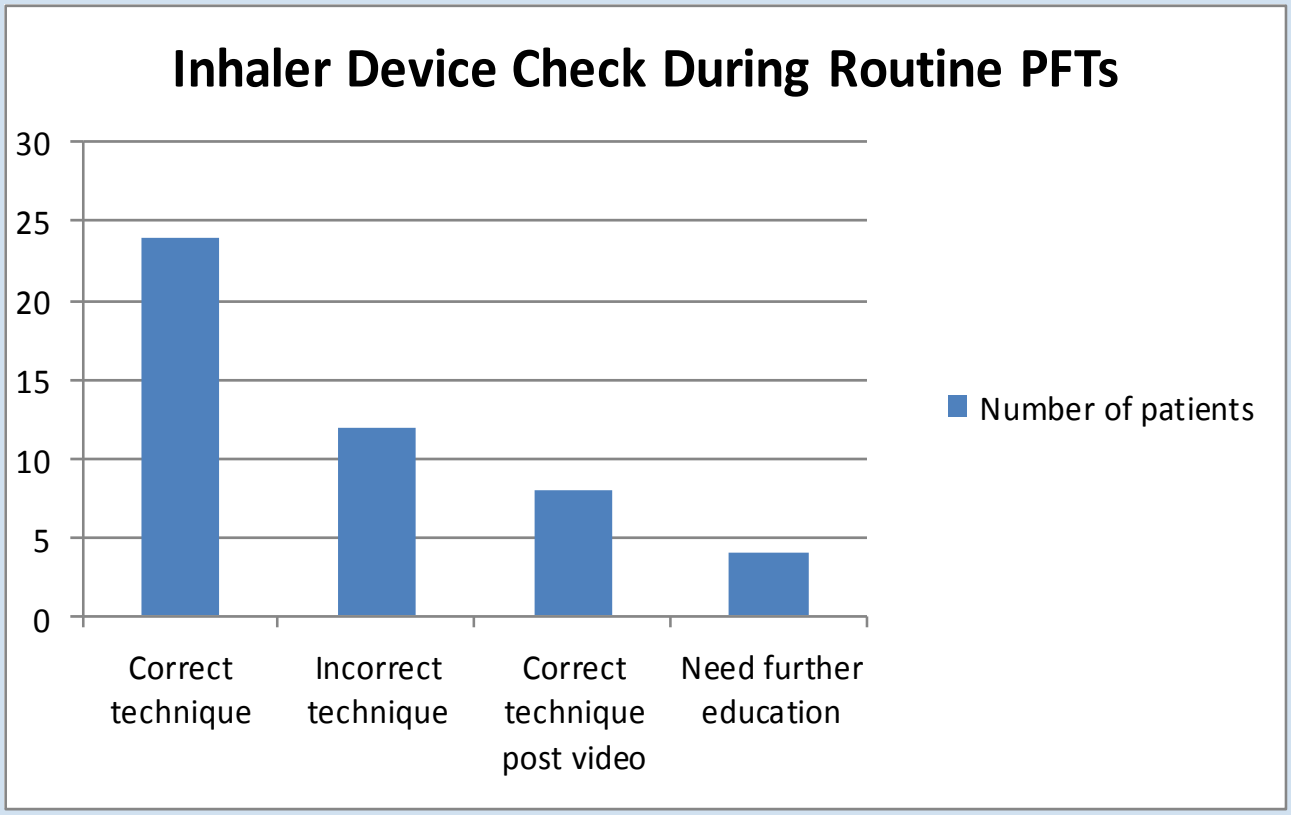

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ISSUE No. 2: October 1976

NEWSLETTER

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Association of Respiratory Technicians & Physiologists

THE GOOD OLD DAYS

By Len Smith

The older generation are always going on about "The Good Old Days", but you often wonder just what this expression really means. There is an element of truth in many legends, however, and the things which made those times seem special must have been more than just sentiment and loss of grey matter.

This attack of nostalgia has been induced by the reappearance of the Report of the Committee on Hospital Scientific and Technical Services, better known as the Zuckerman Report. This was published at the end of 1968 and is now issued as a Consultative Paper for discussion. It deals with the reorganisation of the whole of the technical and scientific side of the Health Service, and the D.H.S.S. are now seeking the opinion of various associations and professional bodies. I personally feel that is fome of the proposals are carried out, the technicians of today will indeed look back nostalgically to the pre-Zuckerman days.

The Report is long and vague, and to summarise it briefly is a near impossibility. Basically it proposes the merging of Physics, Bioengineering and Clinical Physiology Departments into a single Physical Science Service: there would be a common training, education and management programme for technicians who would be seconded to the various clinical departments on a long- or short-term basis.

In the first place, it is not at all obvious to me why on earth Clinical Physiology should be linked with Physics and Bioengineering. There are much closer links in terms of education, training and job

description with Pathology, especially now that a significant number of graduates in human biology are entering the service. A separate Clinical Physiology service, organised as an autonomous body but operating in conjunction with the other three scientific services as proposed by Zuckerman would make for much more efficient utilisation of staff and resources, and lead to greater job satisfaction, a matter of paramount importance.

I agree that the training and education of junior technicians could be much improved. Although their programmes will need to be standardised, many more options should be made available, and it is worth noting that the new T.E.C. schemes scheduled for 1979-80 give a student the opportunity of choosing modules of specialised training in any given field. Secondment to various clinical science departments at this stage therefore, would hardly be in their interests, as they would already have started to specialise in their chosen fields.

Secondments, whether short- or long-term, I regard as being in effect a pooling system, a retrograde step serving to create a "Jack of all trades, master of none". There is also the question of divided loyalties: would the individual technicians be responsible to their directors in the new Physical Science Service, or to the clinical units to which they are seconded? In my opinion, the clinical units themselves would be in a far better position to administer overall control of their technical staff, as they do under the present system.

A second important point is the suggestion that each department will be headed by a Director who would be (and I quote) "preferably non-medical". I can, of course, only assess this in the light of the experience that I myself have found over the years in a clinical unit. Generaly speaking I have enjoyed working with clinicians and a great deal of interest and job satisfaction has been created. On discussion of this with many other experienced staff I have found this to be generally accepted, though there are a few who would have it otherwise. Furthermore, in a clinical department many of the day to day problems encountered with the patients including diagnosis, treatment and interpretation of results can really be carried out only by the clinicians, whose training, after all, is designed for this task.

One important problem has ben the lack of communication between the branches of the scientific service, and there is obviously a need for much closer inter-departmental liaison. With regard to equipment, far more information could be gathered and exchanged between the various units, though it is only fair to mention that before purchase one usually consults colleagues known to have similar instruments. As for maintenance, with equipment becoming more specialised and complex, manufacturers offer comprehensive service contracts. Although these

could be managed separately, and small items maintained and modified centrally, interference with equipment renders most guarantees void.

To summarise I should like to stress the following points:

1) The close integration of clinician and technician is vital to the function of a clinical unit, and should not be discouraged. Clinical units, therefore, should be under the direct control of a physician.

2) A system of secondment would tend to destroy the common interest and job satisfaction existing in clinical departments.

3) It is preferable to have four parallel services, namely Pathology, Clinical Physiology, Clinical Physics and Bioengineering, and Radiography. Each would be separate and autonomous but cooperation would be encouraged.

4) It is worth noting that although the sub-divisions of the Pathology service have a common salary and career structure in the larger hospitals, the various disciplines within that service are autonomous.

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#BritainBreathing

1:4 people have an allergy and the frequency of allergies is increasing. Given the strong association between allergy and asthma, it is important to investigate why allergies are occurring and document the frequency of allergies occurring. The British Society for Immunology, Royal Society of Biology and Manchester University have therefore launched the **#BritainBreathing** project which aims to engage the UK public to act as 'citizen sensors' by tracking their seasonal allergies via an android App.

Subjects are encouraged to download the App and recorded their daily symptoms which will feed into an anonymous database. Each individual subject will be able to track their own symptoms which may help their clinical management. The researchers will then collate all the symptom data and map out when and where allergies are occurring across the UK. These data will be correlated with other datasets on pollens and pollutants and other factors such as the weather, in order to study when and why allergic symptoms are occurring.

The overall outcome will be to create a national map of allergies which will inform on environmental policies and treatments plans specific to certain locations.

ARTP members should encourage their patients to participate in this important study. More information can be found at: http://britainbreathing.org/

Dr. Jane Kirkby

ARTP MEETINGS

Year	Date AGM	Venue	Town/City
1975		Inaugural Meeting King College Hospital	London
1976	12/06/1976	“General Meeting" Brompton Hospital	London
1977		NO MEETING?	
1978		Spring Meeting, Derbyshire Royal Infirmary	Derby
1978		AGM. Charing Cross Hospital	London
1979		Spring:	
1979		AGM;	
1980		Spring: Harefield Hospital	London
1980	04/10/1980	AGM, Walsgrave Hospital	Coventry
1981	04/04/1981	Spring: Hope Hospital	Manchester
1981	10/10/1981	AGM. Derbyshire Royal Infirmary	Derby
1982		Spring:	
1982	16/10/1982	AGM: Harefield Hospital	London
1983	16/04/1983	Spring: Royal Liverpool Hospital	Liverpool
1983	08/10/I 983	AGM: Kings College Hospital	London
1984	06/04/1984	Spring: Stoke Mandeville Hospital	Aylesbury
1984	06/10/1984	AGM: Lodge Moor Hospital	Sheffield
1985	20/04/1985	Spring Leeds General Infirmary	Leeds
1985	05/10/1985	AGM 10th Anniversary Papworth Hospital	Cambridge
1986		Spring	
1986	31/10/1986	AGM:York District Hospital	York
1987	04/04/1 987	Spring: City Hospital	Edinburgh
1987	31/10/1987’	AGM: Manor Hospital	Walsall
1988		Spring ??? With BTS?	Newcastle
1988	14/10/1988	AGM:City Hospital	Edinburgh
1989		Spring Meeting, St Thomas’ Hospital	London
1990	08/12/1990	AGM. Kensington Town Hall	London
1991	30/11/1991	AGM: Queen Mary Westerfield Hall	London
1992		Spring	Stirling
1992	21/11/1992	AGM: B’ham General Hospital	Birmingham
1993		NO MEETING	
1994	18/02/1994	Spring:North Staffs Hospital	Stoke on Trent
1994	26/11/1994	AGM: Stirling University	Stirling
1995		Summer:QMC	Nottingham
1995	24/11/1995	AGM: Pontefract General Infirmary	Pontefract
1996	04/07/1996	Summer:University of Warwick	Warwick
1996	22/11/1996	AGM: Park Hotel Fazakerley	Liverpool
1997	03/07/1997	Univ of Loughborough	Loughborough
1998	22/01/1998	AGM:ICC "25th Anniversary"	Birmingham
1999		AGM:Racecourse/Moat House	Doncaster
2000	10/02/2000	AGM:Hanover International	Daventry
2001	22/02/2001	AGM:Hilton	Blackpool
2002	17/01/2002	AGM:Hilton	Blackpool
2003	16/01/2003	AGM:Moat House	Stratford upon Avon
2004	28/01/2004.	AGM:ICC	Telford
2005	24/02/2005	AGM-Moat House 30th Anniversary	Glasgow
2006	26/01/2006	AGM Hilton Metropole	Brighton
2007		AGM-Moat House	Glasgow
2008		AGM Hinckley Island Roundabout	Hinckley
2009		AGM Hinckley Island Roundabout	Hinckley
2010	28/01/2010	AGM Park Inn Hotel	Heathrow
2011	03/03/2011	AGM Marriott Hotel	Glasgow
2012	26/01/2012	AGM Hinckley Island Roundabout	Hinckley
2013	07/02/2013	AGM Hinckley Island Roundabout	Hinckley
2014	30/01/2014	AGM:Hilton	Blackpool
2015	22/01/2015	AGM:Hilton	Blackpool
2016	14/01/2016	AGM Russell Hotel 40th Anniversary	London