Inspire

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FIRST WORD

Welcome to the summer edition of INSPIRE.

The ARTP Executive Committee are happy to announce the date and venue for the 25th Anniversary Conference of the ARTP. It will be held at the International Conference Centre, Birmingham, from Thursday evening the **22nd January** to Saturday afternoon **24th January 1998.** It is likely you have already received a mailshot concerning the event, and the final programme will follow shortly. The Executive Committee have been putting the final touches to the programme which we hope you will find stimulating and stir people in droves to the Conference. We have managed to arrange many renowned speakers who are experts in their particular field of respiratory measurement. Please support the ARTP in this special event to commemorate a milestone in the Association's history.

The **DeVilbiss travel bursary** to attend the ERS in Berlin in September is still up for grabs. Please send your competition entry ASAP to Dr Brendan Cooper, Lung Function Department, City Hospital, Nottingham NG5 1PB.

This edition of INSPIRE contains a number of very interesting articles and news items. However, during the preparation of each issue of INSPIRE I do struggle to fill at least 10 pages of copy. Please, please help me with your articles, news items, patient anecdotes, tips, letters, moans, groans – anything, within reason, will be published. I do desperately need your help to keep this journal afloat, otherwise this vital communication channel will close, and the ARTP Committee will once again face an uphill struggle to maintain a regular dialogue with members. The copy deadline dates are always **20th January** (winter edition) and **20th July** (summer edition). Please send your contribution to me (address below), and include a copy of your article on a computer disc if possible (save in 'text only').

In this issue Dr Roger Carter presents an evaluation of a new piece of transfer factor kit, Steve Wimpress relates his impression of the ATS Conference in San Francisco (courtesy of a **DeVilbiss Travel Bursary**), and Brendan Cooper presents an overview of the initial findings of the detailed survey covering Respiratory Function Services in the UK. Also featured are the regular items of 'On the Blower', Calendar of events, Charity News and the Review of Articles.

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CHARITY NEWS

National Asthma Campaign

London H/Q Tel No for enquiries or leaflets 0171 226 2260

British Lung Foundation

Sow a Little Hope – Embroidery of patient wishes is in Newcastle at the Discovery Museum from 9th September to the end of October.

Charity parachute jumps for the BLF over the weekend 9th and 10th August, in Glasgow. Contact 0141 204 4110

Classical Concert in Newport, Gwent, Saturday 6th September. Organised by Mr Brian Barr who can be contacted on 01633 892106 for further information.

Another event in Newcastle – this time **The Breathe North Ball** to be held on 11th October. Further information from 0191 263 0276.

26th February 1998 – **The Butterfly Ball,** at The Royal Albert Hall, London. Further information from the BLF H/Q on 0171 831 5831.

Dates for your Diary

15 - 19th September 1997
Short course for Advanced Respiratory Physiology Coventry University.

17 - 20th September 1997
5th World Congress on sleep apnoea.

20 - 24th September 1997
ERS, Berlin.

8 - 9th October 1997
Meeting of the British Sleep Society Edinburgh.

15 - 17th December 1997
BTS Winter Meeting Queen Elizabeth Conference Centre, London.

22 - 24th January 1998
The ARTP 25th Anniversary Conference International Conference Centre, Birmingham.

24-25 February 1998
Third National Conference on asthma education and management QE II Conference Centre, London.

See page 12 for more details.

The 1997 American Thoracic Society (ATS) Conference in San Francisco

A Technicians Report of the ATS Conference in San Francisco by Steve Wimpress (winner of the DeVilbiss Travel Bursary),
Senior Technician, Respiratory Physiology Laboratory, Glenfield Hospital, Leicester.

Having successfully been awarded a bursary to attend this years ATS conference in San Francisco I promptly booked my flight and hotel accommodation, looking forward to this prestigious meeting in such a beautiful and famous location.

Monday 19th May

This years ATS conference was based at the Moscone centre not far from the financial district of San Francisco. The conference centre was very impressive (complete with fountains and waterfalls) and extremely well attended with about 15,000 delegates and exhibitors in total. I first registered on the Monday morning in the reception area and was promptly issued with a black shoulder bag complete with the ATS 1997 conference logo in yellow blazened across it. A final program was issued with the bag and this was a guide to each days lectures and poster events complete with their room number locations at the centre and in adjacent hotels. An abstract book was also issued which was full of all the studies in abstract form that had been accepted this year.

My first port of call was to attend a session on lung diseases which aimed to promote a better understanding of a variety of lung diseases. Each lecture lasted approximately 20-40 minutes and included time for questions and discussion afterwards. The first talk was 'The Hereditary Emphysema Story' and was presented by Dr Ferro from New York. This discussed the alpha-1-anti-trypsin deficiency and smoking histories in families. The second talk was a subject dear to my heart – 'Sleep Apnoea Syndrome: An Epidemiologists View'. This was presented by Dr Redline from Cleveland, Ohio. Dr Redline first defined Obstructive Sleep Apnoea (OSA), and discussed its prevalence in the population, and diagnostic tools including overnight monitoring and health/sleepiness questionnaires. The risk factors and consequences of OSA were outlined, – which in general seemed to be that

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if you are a male of 40-49 years of age and obese (>28 BMI) you are 2-4 times more likely to suffer with this condition!

I soon entered into the lecture mode and set about planning my days sessions. Each lecture room varied in size some being so large that microphones were placed in the aisles for the delegates to question the speaker. Over the lunch periods the exhibition hall was the popular spot where many equipment and pharmaceutical manufacturers in the respiratory field had trade stands. All types of equipment from spirometers to sleep analysers were on show. A willing sportswoman was even exercising on a treadmill to demonstrate respiratory exercise systems. I met many acquaintances from the U.K. and I was particularly interested in a new CPAP/NIPPV nasal mask and equipment yet to be marketed in this country, (do they require a UK representative I wonder?).

In the afternoon I attended a session entitled Occupational and Environmental Asthma. This was held in the Marriott Hotel adjacent to the Moscone centre. The lectures included Use of PEF in the diagnosis of Asthma by Dr S Burge of Birmingham UK. This discussed the importance of serial peak flow diaries in measuring diurnal peak flow variability in patients with asthma. This was followed by a talk from Dr Cartier on bronchoprovocation tests and specific challenges in the diagnosis of occupational asthma. I found this talk of particular interest, since we carry out over 6 bronchial challenge tests each week in my department at Leicester. Dr Cartier first discussed the investigations into occupational asthma and the diagnosis using reversibility testing, the PC20 and even transfer factor. The assessment of occupational asthma, involved specific allergen challenge which is time consuming (lasting up to 6 hours), and presents a far greater risk to the patient in triggering an asthma attack than the non-specific Methacholine/Histamine challenges more commonly performed.

The rest of my afternoon was spent listening to lectures on impairment and disability by Dr Barnhart, from Seattle, and the diagnosis and management of RADS (reactive airways dysfunction syndrome) by Dr Kipen from New Jersey.

Tuesday 20th May

In the morning I attended a session entitled 'Clinical Outcome Measures In Sleep Apnoea'. The objectives of this session were to gain an understanding of general health status, quality of life and the functional status of patients with sleep apnoea, in addition to learning about the results of neurobehavioural testing and use of measures to document improvements in patients undergoing therapy. Dr Young of Wyoming discussed the use of the S-F 36 quality of life questionnaire for the identification and assessment of CPAP therapy in OSA. The efficacy of CPAP can be assessed by increases in the scoring using this health questionnaire. The following speaker Dr Ward of Calgary, Canada presented the use of the Calgary Sleep Apnoea Quality of Life Index, which was developed to assess patients with sleep apnoea. It consists of a scale from 1 to 7 for each question and the higher the score the higher the quality of life. It claims to be more sensitive and specific to the health status and effects of therapy in the sleep apnoea patient.

Neuropsychological testing by Dr Engleman of Edinburgh compared quality of life questionnaires. The lecture by Dr George, of Ontario Canada, explored the measurement of driving performance using simulators. The speaker presented an automobile simulator for use in assessing the driving abilities of patients with OSA before and after therapy using CPAP. Doctors have to report their patients to the authorities if they have a history of car accidents and a diagnosis of OSA.

My lunch and the afternoon was then spent visiting the exhibition hall and area H where poster presentations on sleep disordered breathing were on view and also posters on COPD .

Wednesday 21st May

My final mornings lectures were in the Marriott Hotel in the Yerba Buerna Salon. This hotel was adjacent to the Moscone centre and was very impressive. I listened to a series of lectures on stress and asthma. I was particularly interested in this topic since a young relative of mine had a stress related asthma attack recently! The first lecture was given by Dr Gold of Boston, Massachusetts, and described the effects of stress on wheezing and the incidence of asthma in children with atopic parents. The speaker discussed factors within the family which triggered wheeze and asthma e.g. emotional arousals, anxiety, sadness, excitement or anger. A disturbed family life can lead to emotional upset and trigger asthma in the child. The second lecture by Dr Lehrer, from New Jersey, covered stress management and biofeedback methods in treating asthma. This talk discussed pyschotherapy which aimed to reduce anxiety and tension. This was achieved by helping the patient recognize and deal with problems thus interrupting the vicious circle involving anxiety and tension. Biofeedback methods involve behaviour therapy to induce conditioned responses which help to prevent the patient wheezing when a particular triggering situation is encountered. The final lecture entitled 'stress and asthma – where do we go from here?' by Dr Underwood of Michigan covered the recognition of stressors which trigger asthma and appropriate treatment therapies.

I found the conference inspiring and a great experience. I also feel comforted to realise the methods and techniques performed in my department are compatible with many recommended, or observed, at the conference. I was particularly impressed by the many thousands of delegates from all over the world, all with a common interest and career, if not a common language. I managed to speak with an American counterpart, from Los Angeles, who encouragingly enough mentioned the importance and demand for respiratory technicians in the states, with earnings of $40,000 plus.

Finally, what about San Francisco ? I rode on the cable cars from the city centre to Fishermans Wharf. I cruised under the famous Golden Gate Bridge and around Alcatraz (The Rock), and I bought the T-shirts, read the book and sent the postcards!

I must thank Devilbiss, and in particular Jill Smith and Martyn Winters, for the splendid bursary, enabling me to attend the conference, and of course the ARTP for encouraging Devilbiss to sponsor bursaries for technical staff.

Pilot ARTP Respiratory Services Survey by Questionnaire

A report prepared by Dr Brendan G Cooper on behalf of the ARTP Executive Committee

Background

In Autumn 1995, a questionnaire was sent from ARTP Executive to 203 lung function departments in the United Kingdom with the aim of acquiring a "snapshot" of the profession. The questionnaire enquired about deparments, staffing, the tests performed by type and detailed information of staff experience, qualifications and training. This short summary highlights some of the key points.

106 of the departments were ARTP Members Departments of which 44 replied (37%) and 97 were Non-ARTP Members Departments of which 26 (25%) replied. Overall the response rate was 70/203 (34%). The BTS Directory of Training Posts & Services suggests that 231 (86%) centres have respiratory technicians. Our survey therefore probably represents 30% (70/231) of departments. Assuming that there are 4 technicians per department (national average from this survey), then there are likely to be about 924 respiratory technicians nationwide. The majority of departments which replied were purely lung function 69%, whilst 29% were cardio-respiratory and 2% physiological measurement departments. Most staff who responded work in NHS/DGH/Trust hospitals (n=161), many in Specialist/Teaching hospitals (n=95) and a few in other centres (n=9).

Tests

Unsurprisingly, spirometry, reversibility, lung volumes and gas transfer were reported as available at 100% of responding centres. There was a complete range in the number of these tests performed per month. Interestingly, respiratory muscle assessment is available in 60% of centres (i.e. very widespread) although most centres reported only a few measurements per month. Maximum mouth pressures were available in 50% and transdiaphragmatic measures in 20% of respondants. Sleep studies are performed in 70% of centres (i.e. well established as a lung function department role). This breaks down further to show full polysomnography, multichannel studies, video-oximetry and oximetry for sleep analysis are available in 11%, 30%, 23% and 41% of centres, respectively. Nebuliser assessments and bronchial challenge are performed in over 50% of centres i.e. relatively common. Also, CPAP, NIPPV and BiPAP are available as therapeutic services in 40%, 20% and 13% of centres, respectively.

Pooled estimates of the total number of lung function procedures performed in the previous three years show an increasing (and probably unfunded) demand (15-20% each year!) in service across the country. There is nationally no clear strategy for lung function services development, but it appears at local levels that demand is increasing rapidly.

The minimum grade of technician performing each test was reported and showed that the grades ATO, MTO1 & MTO2 are the minimum grade for the common tests (spirometry, reversibility, lung volumes and gas transfer). MTO2 appears to be the minimum grade for muscle studies, exercise tests and nebuliser trials. Generally, what happens on the ground matches closely with the draft Grading Guidelines, but there were several examples of ATO, and MTO1 grades running services single-handed!. This is clearly inappropriate practice. The minimum grade to run a department should be MTO3 (which assumes all necessary qualifications and training are in place).

Nationally, the most common grades are MTO2 and MTO3, with the expected distribution for a clinical service like lung function, of about 30% of staff at the higher more supervisory grades.

The male: female ratio is 20:80, which is a similar distribution to nursing staff, but the inverse of the medical profession at the moment. This has staffing implications on the service nationally in terms of funding maternity leave for what are generally small departments.

An attempt was made to estimate how many technicians are required for the number of tests or for the number of consultants or the number of beds. There was no clear relationship between the **number of tests, number of beds or the number of respiratory consultants** and the number of technicians. Practice varies largely around the country. The ARTP Executive are currently working on producing some clear guidelines.

Staff experience, i.e. number of years in post, was very variable as can be seen in the table below;

		Years in post		
	ARTP*	Mean	Mode	Median
MTO1	1	2.4	2	2
MTO2	2	4.9	3	2.5
MTO3	5	9.4	5	6
MTO4	8	12.3	7	10.5
MTO5	10	15.8	0	12.4

ARTP* proposed recommendations

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The ARTP Committee Guidelines* on grading structure recommend the rise from MTO1 to MTO5 in the steps shown above (ARTP*, cumulative year). Clearly, the career rise "on the ground" varies considerably from the proposed pattern (even using the median), but for individuals this rise may well be non-existent. The range of experience at a particular grade is enormous and reflects the poor regard for the profession in the past. It is hoped that the improvement in training, the increased expectations in quality and sophistication of measurement in recent years will establish a respectable career structure for an increasingly important part of the respiratory team.

Staff qualifications

Most qualifications were in grades MTO2 and MTO3. Less than 2% in each grade were graduates and 1-6% in each grade had ARTP/BTS National Assessment Qualification. The number of staff with qualifications can be summarised as follows: ATO =14%, MTO1= 85%, MTO2=85%, MTO3 = 85%, MTO4 = 93%, MTO5 = 86%, Clinical Scientists =100%.

The ATO grades have least formal qualifications whilst all other grades had at least 85% with relevant qualifications. Whilst a formal qualification does not always mean that a particular technician is proficient at their job, neither does it mean that those without formal qualifications perform poor quality tests. The profession is moving closer to a fully trained workforce. It appears that the efforts of the ARTP/BTS to train "middle grade" staff is beginning to produce significant numbers of good quality staff. The need for training at "grassroots" level remains a priority.

DISCUSSION

Until recently the guidelines to hospitals for the grading of respiratory technicians has been largely based on the Whitley Council Professional & Technical Staff B Council (PTB Handbook Amendment 1980) documents. They barely reflect the work of the modern laboratory with its adherence to health & safety, infection control, and COSHH legislation, etc.

As the ARTP approaches its 25th year of existence, the profession is moving to embrace therapy delivery (LTOT, nebulisers, CPAP, NIPPV) as well as its traditional role in accurate and reliable measurement and assessment of respiratory function in patients. The increasing role in training and research will be greater as the Calman registrar training scheme reduces the amount of time formerly spent by trainee respiratory doctors on clinical research.

This report together with the ARTP Grading Guidelines (in discussion) are a major contribution to help the ARTP and BTS establish the correct departmental structure for lung function laboratories in Britain. We plan to repeat this survey to the same departments after 5 years to demonstrate changing patterns in departments and staff. However, more work needs to be done by the ARTP and BTS to mould and develop our lung function services nationally for the new Millenium.

OVERALL CONCLUSIONS

This survey of a limited sample of lung function department nevertheless provides a useful glimpse of the national picture of lung function departments.

- It offers a unique "snapshot" of the type and number of tests performed nationally in lung function departments.
- It demonstrates a pattern of increased workload in most departments over the last 3 years.
- It offers a unique insight into the grading of staff and the type of tests performed in each department.
- It shows that 20% of laboratories nationally may be run by a single technician, of which 40% are less than MTO3 grade.
- It provides detailed information on the grade, experience, permanancy and age/sex profile of the profession – all of which have implications for training.
- It shows that at the number of tests performed per technician is completely variable.
- It provides details of the qualifications of technicians in departments according to grade and experience.

Acknowledgements

We are especially grateful to the 70 lung function departments and 270 technicians who very patiently replied to the far from easy questionnaire.

"ON THE BLOWER" – Manufacturers News

We've got New Labour, New British Airways, we always had New Zealand, and "On the Blower" brings you even more "News" . . . and views! I am pleased to announce that an edited version of this article will appear in BTS News on a regular basis. So if you think you have read this before - put it down and stop wasting NHS time!

1. The DeVilbiss/ARTP Travelling Bursaries

The Executive Committee have reconsidered **all** bursaries. I am pleased to announce that the **DeVilbiss/ARTP ERS Bursary 1997 for the Berlin Meeting** (£500) is now open to all grades of staff. Details of all bursaries will be circulated soon. Negotiations are now underway with several companies for more national & international bursaries. Reports should be primarily about oxygen delivery, CPAP treatment or inhaled drug therapy and related subjects.

2. Trade Stand

Pharmaceuticals

There are few dramatic breakthroughs to report on the drug front. **3M** have a new formulation of beclomethasone, and now have their Aerochamber with mouthpiece available on FP10. **Boehringer** are pushing hard to improve education and support to primary care. In fact there is now a consortium of drug companies and equipment manufacturers providing backing for the successful launch the long-awaited COPD Guidelines. (Incidentally, the BTS/ARTP Liaison Committee are developing a specific assessed course for practice and ward nurses in the correct use and maintenance of spirometers also to support the COPD Guidelines. Launch date: Before Jan 1998)

Allen & Hanburys now use **the Baker Norton EasiBreath** device with their beclamethasone MDI. The Becotide50 and Becotide100 in EasiBreath format are actually cheaper than the standard MDI. What makes this story slightly more surprising is that the basic drug in the Baker Norton EasiBreath devices are manufactured by GlaxoWellcome, who of course own Allen & Hanbury's!!! It's a funny old market place!

Lung function equipment

Air Safety, the filters people, now offer a complete range of filters for lung function testing equipment and ventilators and CPAP machines. Not only are they offering competitive prices but they can back up their product with independent testing from Porton Down. As the ARTP/BTS Guidelines on Infection Control are being prepared *(they are unlikely to be ready this side of 1998 I'm afraid!)* taking the decision on whether to switch to single use filters or not will become easier. Meanwhile if you already use filters, check out their price and quality.

Erich Jaeger continue to offer some of the best Windows based software with their lung function equipment. Their new exercise software looks very good and the reports can look very good indeed. I think they are the only one of the "Big Four" lung function companies to offer oscillometry (IOS) as an option?

Ferraris
PKM have started sending me and all users, Morgan Viewpoint, which is a "regular series of thought provoking articles". Thought provocation is useful – but nothing beats direct action to solve existing problems. PKM can be contacted via their Service Line number.

Most PKM users will have received a long article about BTPS correction factors for spirometers (see this issue of Inspire). My understanding of this letter is that choosing correction factors from tables in textbooks as opposed to calculating from basic formulae will always produce errors. However, to be fair to PKM, the ARTP/BTS need to issue guidelines which state which ATPS:BTPS factors should be used with rolling seal, pneumotachograph, wedge bellows, rotating vane, and mass flow meters calculations. These are currently being considered by the ARTP/BTS Liaison Committee. Thanks to PKM for responding in a timely manner to this issue. Watch this space!

CaSE . . . or is it Morgan? are keen to boost their ergospirometry systems based around their mass spectrometer the AVOCET *(I wonder what that's an acronym for?)* marketed as the Morgan MGX 2000 *(Isn't that a sports car?).* Anyone who has got an independent review of using such a system please drop me a line?

Pari Medical Ltd.
Pari, the nebuliser people now offer a range of Fleisch pneumotachograph linked to PC spirometers aimed at clinics, GPs and occupational health facilities. They also have a hand held machine with a 300 patient memory facility. Like many new spirometers hitting the market now, they meet ATS and ECCS criteria, but I've not seen any independent comparative or reproducibility data yet. For further details contact John Fonseca on (01932) 341122.

Sleep study and associated equipment

DeVilbiss
The new Devilbiss MiniPAP has hit the noses around the country as I write. It's the smallest CPAP they have produced and I reckon it is one of the quietest on the market. *(Just for the record . . . I do not take CPAPs home and demonstrate them in the bedroom! Well, not that I'd admit to here!!)* It looks remarkably similar to the Healthdyne machine but as far as I can tell is the most competitively priced in the British market (contact your local representative). It's operation is a lot simpler than that awful Horizon model that preceded it with the button that did nothing! To give them credit, they actually listened to their customers!

Respironics/Medic Aid
Oh dear, I think I upset their head office likening their products to the Reliant Robin! Sorry guys, but we're still buying your products. They now offer the most comprehensive range of "patient-machine interfaces" . . . sorry, **masks** for CPAP and NIPPV. I'm sure they've got a new CPAP named after some musical term or other. Will they ever produce "The Song". (Headline: "Medic Aid going for a Song")

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ResMed
The VPAP II & ST has been launched which fits in the market between bi-level PAP and assisted ventilation. Its pressure range is 4.0 to 25 cm H2O which is a higher pressure than most of the bi-level PAP machines available. It is also one of the quietest. VPAP II & ST list prices are as follows; £2950 and £1695 excl VAT. ResMed will launch their new range of Mirage masks in the late summer. Prices are similar to the old masks - but you don't get all those bits of ""Airfix Kit" thank goodness.

I couldn't help noticing at the ATS Manufacturers Exhibition that we now have BiPAP, CPAP, DPAP, EPAP, IPAP, & VPAP. It's only a matter of time before we get ZPAP – pressure whilst you sleep; and TPAP pressure whilst you drink. Fortunately P-PAP sounds rather silly!

Stowood Scientific Instruments
SSI continue to to make good, modular, sensibly priced, well thought through software and sleep systems. Their very successful Ohmeda and Minolta oximeter download packages have been re-vamped for Windows at only £350! I think that is a great value way to set up sleep apnoea screening on the cheap! They are currently working on the OSLER wakefulness test software which John Stradling's department reported at the winter BTS. This will be marketed probably with the download kit for under £500.

Deva Medical
Deva continue to do well increasing their sales staff, largely to meet the demand for the marketing of the Breas 401 ventilator. Prices are competitive and the "flexibility" of this model makes it suitable for acute use and long term assisted ventilation. The option of battery back-up (12 hours) or power via a car cigarette lighter socket (ironic huh?) are attractive features. Deva Medical (01928) 565836.

Oxford Instruments
I received a press release about the Questar (Quantification of EEG and Sleep Technologies Analysis & Review – *tortured acronym or what?*) neural network analysis system. It analyses sleep in one second "epochs" picking up microarousals, and microstructure of sleep. Whilst I'm envious of being unable to spend £30K on such a system – in the real world of the NHS finances – do you really need it for mass screening in OSA? Loaded Trusts can contact the company on (01325) 533433.

Miscellaneous

Pulmolink
This Kent based company, are agents for the U.S. company BCI who do a range of pulse oximeters and a capnograph. They are also agents for Collins the up-market U.S. lung function equipment people and are well worth contacting for importing specialist equipment particularly for research. Prices are realistic, but I have no idea about quality or reliability yet. *(What does this guy know?* I hear you ask.) Pulmolink, Ashford, Kent, Tel: 01233 713070.

3. Complaints Database and WatchDog.

ARTP / P K Morgan Users Group
A meeting was held in May between PKM users and representatives of the ARTP who have had problems and queries over PKM equipment and software. This was the first of a series of constructive meetings which aim to highlight common problems, offer suitable solutions and aid in standardisation of measurements nationwide. I will keep you posted of progress and outcomes in future editions of this feature.

Signs of Excellence
It was always our intention to praise as well as criticise manufacturer's, so I thought I would start the ball rolling with a few examples of my own. I must report the excellent service I received from **Stowood Scientific Instruments** when I had a recent software problem with a **VisiLab** sleep study. The fault occurred on Monday night, I 'phoned and sent a copy of the file on disk on the Tuesday and by the Friday morning I had the corrected file, a typed page of how to re-install the file and a follow-up phone call. Well done SSI! Similarly, I received equally good service from **DeVilbiss** whilst rushing through an end of year order. The basics of keeping the customer informed and anticipating problems smoothed over a stressful situation. Finally, we received excellent engineer call-out within hours of request from both **Chiron** and **Erich Jaeger.** Do members have any other examples?

When writing to the Complaints Database and WatchDog, please state (i) **exact dates,** (ii) **names of people you dealt with** and (iii) **state clearly your grievance.** Also, give a **summary account** of the history of your complaint (a maximum of one page of A4). There is no need to send photocopies of correspondence at this stage.

4. Other ARTP/Manufacturer User groups

Jaeger, SensorMedics, Vitalograph have all expressed an interest in forming similar user groups. ARTP Executive are keen to encourage such liaison, but executive members time used for commercial companies interests will need squaring up financially with NHS Trusts. I anticipate, that the patients and the NHS will be the long term gainers – but who pays the ferryman?

5. ARTP 25th Anniversary Meeting: Birmingham 22nd - 24th January 1997

Plans are well advanced for this exceptional celebration and we are grateful to the following companies who have already pledged generous support for what will be the largest lung function exhibition in the UK for many years:

AVL Medical Instruments
UK Ltd
Sensor Medics
DeVilbiss HealthCare
(UK) Ltd
P.K Morgan Ltd
Deva Medical
Medic Aid
Fisher & Paykel
Nikon Kohden
ResMed (UK) Ltd
Pari Medical
Erich Jaeger (UK) Ltd
Boehringer Ingelheim
Radiometer Copenhagen
Instrumentation Laboratory
Vitalograph
Air Safety

[For companies not listed above who want to take advantage of early registration and choice of the best sites at the exhibition hall, please contact me urgently (FAX: 0115 960 2140)]

Once again, lung function departments and Manufacturers – please continue to send me your news and views.

Dr Brendan Cooper, (ARTP Manufacturer's Liaison Officer) Lung Function Department, Nottingham City Hospital, Nottingham NG5 1PB.

FAX: 0115 960 2140 Tel: 0115 969 1169 ext 46194.

RECENT ARTICLES

The following summarise recently published articles appearing in medical journals which may be of interest to ARTP members

DIAGNOSTIC TESTING

I. D. PAVORD, M.M.M. PIZZICHINI, E. PIZZICHINI, F.E. HARGREAVE. Thorax 1997; 52: 498 - 501

THE USE OF INDUCED SPUTUM TO INVESTIGATE AIRWAY INFLAMMATION

This editorial details the development of methodologies to investigate sputum differential cell counts, and flow diagrams describing the protocols for inducing sputum and processing the samples. An interesting yet simple review.

A VAN MUYEM et al. Thorax 1997; 52: 643 - 647.

ROLE OF PULMONARY FUNCTION IN THE DETECTION OF ALLOGRAFT DYSFUNCTION AFTER HEART-LUNG TRANSPLANTATION.

The sensitivity, specificity and positive/negative predictive values of lung function for the detection of allograft dysfunction were assessed in 33 patients who underwent heart-lung transplant. The patients were followed for a mean period of 16.3 months. Specimens of transbronchial biopsy material and/or BAL fluid were used as the gold standard markers of allograft dysfunction and compared with functional measurements performed at the same time. Indices of ventilation distribution, FEF25-75, and TLC had the best optimal sensitivity for the diagnosis of infection and rejection after H-L transplantation. The authors suggest the high positive predictive value of pulmonary function in detecting allograft dysfunction should be used to determine the requirement for an invasive diagnostic procedure.

KHARITONOV S et al. Eur Respir J 1997; 10: 1683 -1693

EXHALED AND NASAL NITRIC OXIDE MEASUREMENTS: RECOMMENDATIONS.

This is a report by the ERS task force "Measurement of Nitric Oxide in Exhaled Air". The measurement of exhaled nitric oxide may provide a simple noninvasive means of measuring airway and pulmonary inflammation. As such technicians and nurses may be required to monitor the gas as a marker of treatment efficacy. This report sets out recommendations on NO measurement, factors which influence its concentration, the background and theory to the measurement and equipment. Since there are a number of small portable devices on sale it is important we understand how to make the measurement accurately and employ good quality control procedures.
Strongly Recommended Article

CHANG AB et al. Eur Respir J 1997; 10: 1637 -1639

A NEW USE FOR AN OLD HOLTER MONITOR: AN AMBULATORY COUGH METER.

This paper describes how you can re-cycle all those ECG Holter monitors from the 1980's into brand spanking new cough meters for the 1990's! Honorary membership of Greenpeace included. The authors conclude their newly described ambulatory cough meter provides a valid and inexpensive method of objectively monitoring cough for 24h.

RICHTER LARSEN K et al. Eur respir J 1997; 10: 1559 - 1565.

EXERCISE TESTING IN THE PREOPERATIVE EVALUATION OF PATIENTS WITH BRONCHOGENIC CARCINOMA.

The aim of this study was to investigate the best predictors of postoperative mobidity and mortality in patients with bronchogenic carcinoma from pre operative measures of spirometry and cardiopulmonary exercise test. The authors found a combination of results from both spirometry and the exercise test could be used as preoperative criterion for operability.

PASKER HG et al. Eur Respir J 1997; 10: 1523-1529.

SHORT-TERM VENTILATORY EFFECTS IN WORKERS EXPOSED TO FUMES CONTAINING ZINC OXIDE: COMPARISON OF FORCED OSCILLATION TECHNIQUE WITH SPIROMETRY.

The authors found the forced oscillation technique was at least as sensitive as spirometry to detect small across shift changes in ventilatory function.

PHYSIOLOGY

E.M. TSCHERNKO et al. Thorax 1997; 52: 545 - 550.

CHANGES IN VENTILATORY MECHANICS AND DIAPHRAGMATIC FUNCTION AFTER LUNG VOLUME REDUCTION SURGERY IN PATIENTS WITH COPD.

This study was undertaken to investigate the changes in ventilatory mechanics and diaphragmatic function following LVRS. Eight patients were studied before and up to 6 months following surgery. Measurements of

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oesophageal pressures and airflow were made on spontaneously breathing patients. Work of breathing, Pdi and dynamic compliance improved significantly one day after surgery. The improvements were still present at 6 months. Airways resistance and PEEPi (a measure of air trapping) fell, and PaCO2 decreased in the long term. Overall the authors found ventilatory mechanics improved immediately after LVRS and this was likely to be attributable to decompression of lung tissue and relief of thoracic distension. The persistent long-term improvement in diaphragm function also contributed to improved respiratory function.

PEACOCK AJ, JONES PL. Eur Respir J 1997; 10: 1439 - 1444.

GAS EXCHANGE AT EXTREME ALTITUDE: RESULTS FROM THE BRITISH 40TH ANNIVERSARY EVEREST EXPEDITION.

Arterial oxygen saturation and the alveolar partial pressure of oxygen was measured in 9 subjects as they climbed from 3,500 to 8,000 m on Mount Everest, without supplementary O2. Experiments with supplemental oxygen were carried out at 6,500 and 8,000 m. The authors were able to demonstrate a better than predicted performance from hypobaric chamber studies and explain, in part why people are able to reach the summit without supplemental O2.

SLEEP

C.F.P. GEORGE et al. Thorax 1997; 52: 648 - 653.

EFFECTS OF NASAL CPAP ON SIMULATED DRIVING PERFORMANCE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA.

The authors performed a divided attention driving test (DADT) on 17 men with OSA before and after 1 to 12 months of CPAP treatment. 18 normal control subjects were also studied. The DADT was performed for 20 minutes and then followed by a MSLT. The treated patients improved significantly on all measures of performance, and particularly in tracking error which returned to the levels of the controls. The authors concluded that impairment in laboratory driving performance skills in patients with OSA is reversed by successful treatment with CPAP. Changes in daytime sleepiness accounted for some but not all of the improvement.

ASTHMA

D.G. COOK et al. Thorax 1997; 52: 628 - 633.

EFFECT OF FRESH FRUIT CONSUMPTION ON LUNG FUNCTION AND WHEEZE IN CHILDREN.

In this large epidemiological study of 2650 children aged 8 -11 yr, FEV_1 and fresh fruit consumption were assessed. FEV_1 was postively associated with frequency of FF consumption. After adjustment for other confounding factors those who never ate FF had an estimated FEV_1 some 79 ml lower than those who ate fruit more than one a day. The association between FEV_1 and FF consumption was stronger in subjects with wheeze. The authors concluded that FF consumption appeared to have a beneficial effect on lung function. However they suggested further work might reveal whether the effect was restricted to those that wheeze, and what the specific nutrient might be.

N. C. BARNES et al. Thorax 1997; 52: 523 - 527.

PRANLUKAST, A NOVEL LEUKOTRIENE RECEPTOR ANATAGONIST: RESULTS OF THE FIRST EUROPEAN, PLACEBO CONTROLLED, MULTICENTRE CLINICAL STUDY IN ASTHMA.

Leukotriene receptor antagonists have been shown to protect against bronchoconstriction induced by antigens, exercise and cold air. The reported study is the first on patients with asthma outside of Japan. The design was a randomised, double-blind, placebo controlled, parallel group, mulitcentre, 4 week study of the safety and tolerability of oral pranlukast. Morning home peak flows were significantly higher in the active treatment group, and FEV1 increased significantly one hour after the first dose of pranlukast,the effect lasting 8 hours. Symptoms and night-time asthma scores also improved. The conclusions of this initial study appear to be very encouraging. The Pranlukast was well tolerated and an effective treatment for asthma.

COPD

OKUBADEJO AA et al. Eur Respir J 1997; 10: 1572 - 1575.

HOME ASSESSMENT OF ACTIVITIES OF DAILY LIVING IN PATIENTS WITH SEVERE CHRONIC OBSTRUCTIVE PULMONARY DISEASE ON LONG-TERM OXYGEN THERAPY.

This study examines the relationships between ADL,QOL, mood state and airways obstruction in patients using LTOT and a group of patients not using LTOT.

GUIDELINES

CURRENT BEST PRACTICE FOR NEBULISER TREATMENT.
Thorax April 1997, vol 52, supplement 2.
BTS Guidelines. A must for all departments.

REVIEW
European Respiratory Review, Volume 7, Review No. 44, June 1997.
Nebulized Therapy.
Comprehensive review articles on use and prescription.

A Validation of the Morgan Transflow System for the Measurement of the Single Breath Transfer Factor

ROGER CARTER – Department of Respiratory Medicine, Royal Infirmary, Glasgow G31 2ER,

INTRODUCTION

A new system developed by PK Morgan, the Transflow is a compact computerised system which contains gas analysers for helium (Thermal Conductivity), carbon monoxide (Micro Fuel Cell) and oxygen (Polarographic Cell), a monolithic crystal pressure transducer and a mouthpiece assembly with pneumotachograph and a system of solenoid operated gas switching valves. The system enables the measurement of the Single Breath Transfer Factor and its components using two different oxygen concentration gas mixtures by the method of Roughton and Forster. The purpose of the present study was to validate the measurement of the transfer factor using the Transflow System in normal subjects and patients with particular reference to patients awaiting or having undergone heart transplantation who were assessed as part of a wider study.

METHODS

TL_{CO} and K_{CO} were measured by the Single Breath technique using either the Transfer Test Model B (as an established device) or the Transflow Test Model 540 (PK Morgan, Kent, England) according to the recommendations of the European Respiratory Society (ERS). Quality control and procedures of testing were also performed according to formal guidelines established by the ERS[1] . Before each test was performed, each subject was carefully instructed in all the required manoeuvres . After preparing the system, the subject wearing a nose clip was connected to the breathing valve with a mouthpiece fitted with a filter (Spiroguard, Air Safety Ltd.). After a few tidal breaths, the subject was instructed to breathe out as fully as possible, and at full expiration, the subject was connected to the test gas mixture and asked to breathe in as fully as possible. The subject was then encouraged to hold this breath for about 10 seconds, without straining, after which he was asked to breathe out rapidly without interruption. The contents of the test gas were as recommended by the ERS[1] and consisted of 0.28% carbon monoxide, 14% helium, 18% oxygen and balance nitrogen. After a pre-set washout of between 500-900 ml, the expired air was directed to the expired bag with a collection volume of between 600-900 ml for the Model B and a sample collection time of 1-2.5 seconds for the Transflow system depending on the individual subject. On completing the expiration, the subject was disconnected from the breathing valve and gas analysis started followed by a display of the test results which were inspected for acceptability. The test was then repeated after a 5 minute interval. The criteria for acceptable measurements were:

1) Inspiration should be rapid and the inspired volume should be at least 90% of the previously measured vital capacity.
2) Breath holding should be maintained at full inspiration, and the final breath-hold time (starting at 66% of inspiratory volume and ending at 50% of the expired sample volume or time) should be between 9 and 12 seconds.
3) The values of TL_{CO} and K_{CO} in two technically acceptable measurements should be within 10% of each other.

42 consecutive patients referred from respiratory and general medical clinics were studied. The group consisted of patients with a range of cardiopulmonary disorders of varying degrees of severity and included heart transplant patients. TL_{CO} and K_{CO} values were obtained for each patient using the two systems in two separate sessions. The two sessions were randomly allocated, and were separated by at least 30 minutes. The results of two technically acceptable results were averaged for each device with a five minute waiting period between each repeat measurement.

STATISTICAL ANALYSIS

Comparisons between devices used for TL_{CO} and K_{CO} were performed using the paired samples Student's t-test. The degree of agreement between results obtained by either device was assessed using Bland and Altman statistical analysis[2] and linear regression.

RESULTS

Table 1 shows summary statistics of TL_{CO} and K_{CO} using the two transfer test systems. Using the Model B, mean TL_{CO} and K_{CO} were 7.54 and 1.43 $mmol.min.^{-1}kPa^{-1}$, respectively, with a wide range of values for each reflecting the wide spectrum of patients. The corresponding values using the Transflow Model were almost identical.

Figure 1 is a scatter plot of individual TL_{CO} values as measured by the two systems. TL_{CO} values obtained by the two systems were highly correlated ($r = 0.99$, $p<0.001$), and this was the same for K_{CO} values (Figure 2). Figure 3 is a plot of the difference between the TL_{CO} results obtained by the two systems against their mean. There was excellent agreement between the values obtained by the two systems. The mean difference was 0.05 $mol.min.^{-1}kPa^{-1}$ with very small limits of agreement (–0.03 to 0.13). For K_{CO} (Figure 4), the mean difference was 0.01 $mmol.min.^{-1}kPa^{-1}$, and limits of agreement were 0.00 to 0.02.

DISCUSSION

The Transflow System (PK Morgan, Rainham ,Kent, England) is a new piece of equipment for the measurement of the single breath transfer factor for carbon monoxide. The system contains integral gas analysers and a fixed pneumotachograph for flow and volume measurement . In addition, solenoid operated valves within the mouthpiece assembly are used for switching between the inspired bag and expired bag after a preset dead space wash out . The mouth piece assembly also contains a port for voiding exhaled gas to atmosphere or for 100% oxygen breathing, from wall mounted or cylinder oxygen through a valve box and

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anaesthetic bag reservoir. The system also allows easy switching between standard and high oxygen gas mixtures for the measurement of the transfer factor and its components based on the Roughton and Forster relationship.

The results of the present study show good agreement between TL_{CO} and K_{CO} results obtained by the Transflow system and the Model B Transfer Factor equipment across a wide range of values in both indices. In addition, the difference between values obtained by the two systems in individual patients is comparable to the expected intra individual variability of repeated measurements on any particular measuring system[1]. We conclude, therefore, that the Transflow system gives reliable and repeatable results of the transfer factor for carbon monoxide when compared with an established method of measurement (Model B Transfer Test).

REFERENCES

1) Cotes JE, Chinn DJ, Quanjer PH, Roca J, Yernault JC. Standardisation of the measurement of transfer factor (diffusing capacity). Report of the Working Party Standardisation of Lung Function Tests, European Community for Steel and Coal. Official statement of the European Respiratory Society. Eur Respir J, Suppl. 1993;16:41-52.

2) Bland JM, Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. Lancet 1986;1 :306-10.

Table 1:

Summary statistics of TL_{CO} and K_{CO} using the 2 transfer test systems

		Mean	SD	SEM	Range
TL_{CO}	Model B	7.54	3.21	0.49	1.9 - 14.7
	Transflow	7.49	3.17	0.49	1.7 - 14.0
TL_{CO}	Model B	1.43	0.41	0.06	0.44 - 2.21
	Transflow	1.42	0.40	0.06	0.41 - 2.11

Figure 1:

Scatterplot of TL_{CO} values obtained by the 2 transfer test systems

(Model B and Transflow Model)

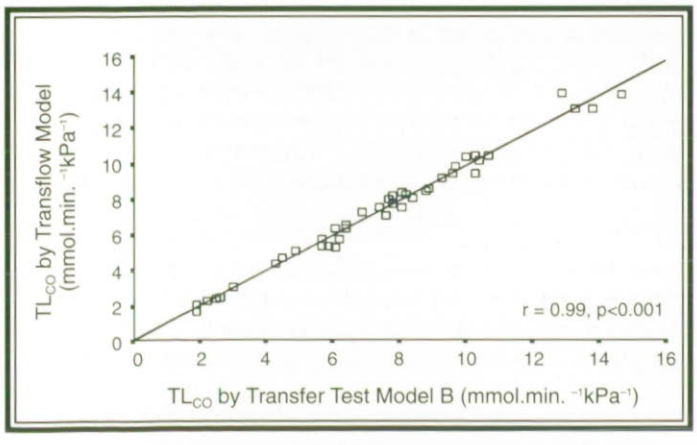


Figure 2:

Scatterplot of K_{CO} values obtained by the 2 transfer test systems

(Model B and Transflow Model)

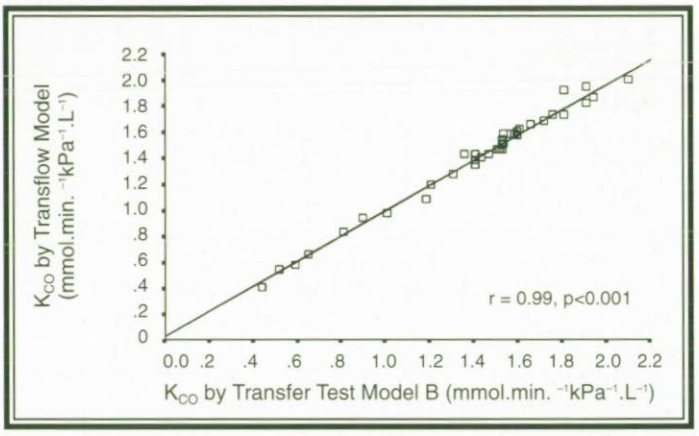


Figure 3:

Plot of the differences between TL_{CO} values obtained by the 2 transfer test systems against their mean

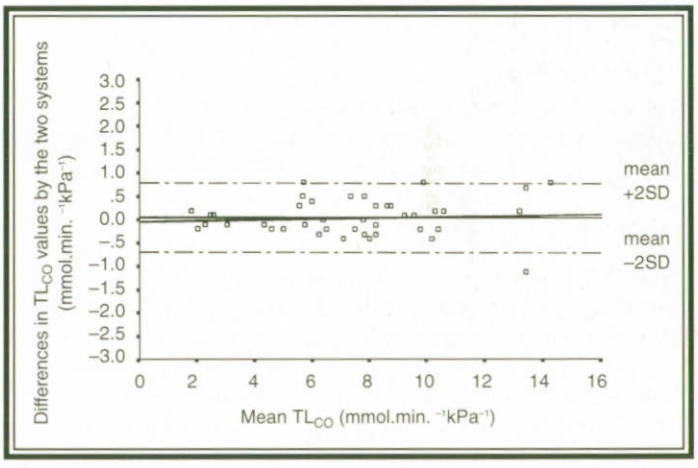
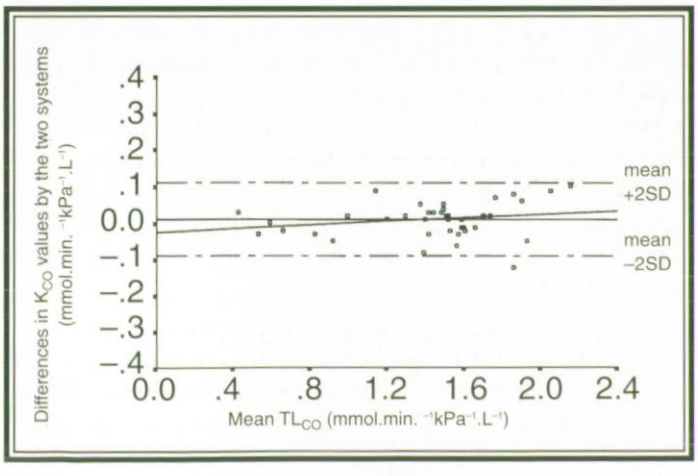


Figure 4:

Plot of the differences between K_{CO} values obtained by the 2 transfer test systems against their mean



Calendar of Forthcoming Events

15 - 19th September

Short Course in Advanced Respiratory Physiology
(incorporating the HTEC Specialist Option)
Coventry University
Topics:– Bronchial challenge and skin testing. Gas transfer and measurement and flow-volume loops.Invasive and non-invasive blood gas measurement. Respiratory and cell physiology.
FEE:– £125 for week (or £25/day)
Reduction for ARTP members £112.50/week, £22.50/day.
Quote ARTP membership number on application form.
Contact Sue Revill for form on 0116 256 3652

17 - 20th September

5th World Conference on Sleep Apnoea
Contact: Dipl.-Psych. Anne Rob-Ellwardt, Klinikum der Philipps-Universitat, Zentrum Innere Medizin, Schlafmedizinisches Labor, D-35033 Marburg.

20 - 24th September

ERS Annual Congress
Berlin, Germany
Information from ERS office
Tel: Switzerland 41 21 617 2868
Fax: Switzerland 41 21 617 28 65

15 - 17th December

BTS Winter Meeting
QE II Conference Centre London

22 - 24th January 1998

The ARTP 25th Anniversary Conference
International Conference Centre, Birmingham.
Contact Mrs E.P. Ford, Lung Investigation Unit
Nuffield House, Queen Elizabeth Hospital
Birmingham B15 2TH.
Tel: 0121 697 8339
Fax: 0121 627 2012

24 - 25th February 1998

Third National Conference on Asthma Education and Management
Queen Elizabeth Conference Centre London
Contact Marianne Turner, National Asthma Campaign
Tel: 0171 226 2260.

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Below is an edited version of a letter sent by PK Morgan to users of their Lung Function Equipment concerning the method of calibration.

Dear Customer

Dr Brendan Cooper of the Nottingham City Hospital reported recently in an article in INSPIRE, vol 1 No 8, that in applying a 3 litre syringe to a computerised dry rolling seal spirometer, he found substantial errors in the readout.

It is well known that when applying a temperature reading of 37^{o}C at a barometric pressure of 760 mmHg a BTPS factor of unity will be obtained, but this only holds true for water spirometers. Since there is 100% water vapour saturation in both the lung and a water spirometer the factor of unity will stand if the above temperature and BP are adopted.

Dry rolling seal spirometers, pneumotachographs, turbines and mass flow sensors by virtue of their method of construction may not have this correction factor applied directly to all calculations. In particular dry rolling seal spirometer contain some rained out condensate and it is therefore judged to be at approximately 60% saturation, and it is for this reason that the full ATPS to BTPS factor is not applicable to this instrument.

It is interesting to note that one leading laboratory has in the past suggested a BTPS factor of 1.1 to be used globally, to ensure that at least the 'error' will be consistent.

There are deeper issues such as the way in which gas signals are treated in the calculation of the volumes independent of a volume transducer, which should now be at the forefront of scientific consideration.

PK Morgan Ltd will customise users software on request, to Dr Coopers recommendation, but it should be realised we still recommend the use of the STPD to BTPS correction for use with dry rolling seal spirometers. Our long association with both water and dry rolling seal spirometers has always ensured our ethic is to provide reproducibility in transducer technology over ongoing developments. We will be pleased to enter into further discussion on appropriate BTPS factors for various transducers, and we consider that this should be a major area of standardisation to be included in the BTS guidelines. Correspondence with the BTS and ARTP should be encouraged with views aired in the appropriate journals.

Yours Sincerely

Roynan Kernaghan – for PK Morgan.

Jane Benson from Rotherham General has passed on a copy of a letter from the Forum of People with Disabilities concerning the use of the OXYLITE 240 – WITH CONSERVER MODEL 201.

Dear Sir

The filling instructions with this equipment are not comprehensive and more information is required. Care must be taken with tubes when fitting them into the conserver, if the patient is active the connection must be re-checked regularly to ensure it remains secure.

The cylinder is very light and easily transported. When filling to 2,000 lbs PSI to get a 9.5 hour supply it is a real bonus. However it is only possible to fill to 2,000 lbs PSI when filling from a full parent cylinder, the next fill is only to 1,700 lbs PSI and then the fill drops as the parent cylinder pressure gets lower. This will eventually equalise pressures, then the parent cylinder can be used as the supply in domestic use.

I feel the oxygen through the conserver gives a better therapy than other alternatives I have tried.

This type of equipment will enable more people to take a full role in society, and is a bonus for people who are limited in their daily activities because of oxygen therapy.

Yours Faithfully

Mr G.F. Fullwood – Forum for People with Disabilities.