Inspire

The Official Journal of The Association of Respiratory Technology and Physiology

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FIRST WORD

Welcome to the latest edition of ***Inspire***. As many members will have heard at the ARTP Winter Meeting in Daventry, Sue Revill is stepping down after seven years as Editor. On behalf of ARTP members and her colleagues on the Executive Committee, I would like to thank Sue for carrying out this monumental task, keeping us in touch with the latest ARTP news and providing the means for communication on many issues related to the field of respiratory function. Hopefully Sue can now find a bit more time to develop her other career ventures.
Good Luck Sue.

There is a move towards an Editorial Board for ***Inspire*** which will also probably develop strong links to the ARTP's emerging website (see inside for further news of this) but we hope that the journal will continue to cover a wide range of issues, provide you with what you want to know and continue developing into the future.

Much of this issue covers the successful Winter Meeting at Daventry in February and includes summaries of all the abstracts presented, responding to the request made by many members attending. The process of State Registration is also moving forward rapidly and the latest information and Statement from Clinical Physiology is within these covers!

I will be coordinating ***Inspire*** for the time being and would welcome comments on issues that you would like to see covered in the future or any ideas you have which would enhance communication within the ARTP. Articles, letters and other contributions can be sent to me:

Gill Butcher
Cardiorespiratory Unit
Queen's Hospital Burton
Belvedere Road Burton-on-Trent DE13 0RB

DATES FOR YOUR DIARY

Short courses in Advanced Respiratory Physiology
Coventry University

25th to 29th September 2000
Topics – Anatomy, histology and physiology of the respiratory system; cell biology and biochemistry of the respiratory system in relation to disease; physiology of ventilation and gas exchange; methods of measuring lung volumes, airways resistance and gas transfer; simple spirometry; blood gas measurement; flow-volume loops; methods for determining respiratory muscle function; allergy; bronchial challenge and skin testing.

March 2001 (dates to be confirmed)
Topics – Control of respiration; respiratory responses to exercise; measurement of exercise response; physiology and methods of assessing ventilatory control; measurement of ventilatory response; field walking tests; inhalation therapy; ventilatory and physiological changes during sleep; changes in exercise response with disease.

The cost of each week will be £300 excluding accommodation and subsistence. ARTP members receive a 10% discount.

For further information or registration please contact:
Anna Kovaluchuk, Biosciences (DG23), Coventry University, Coventry, CV1 5FB Tel : 01203 631313

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NATIONAL ASTHMA CAMPAIGN TAKE THE PLUNGE FOR ASTHMA

Olympic swimmer Karen Pickering M.B.E., is the captain of the National Asthma Campaign's Great British Swim and is looking for individuals and groups to join in this year's event commencing Monday 9th October.

So if you are looking for a way to shape up and get fit, why not dive in and make a splash as part of the National Great British Swim team. It doesn't matter if you swim a couple of lengths or a couple of miles – everyone will be able to contribute to the overall target of 6629 miles – the equivalent distance around the coastline of the UK. Prizes are up for grabs for the longest distance swimmers and top individual and group fundraisers for the greatest sponsorship raised.

For more information, write to the events team at National Asthma Campaign, Providence House, Providence Place, London N1 0NT or call 020 7704 5861.

NEWS FROM THE SCOTTISH FORUM

The ARTP Scottish Forum held a very successful meeting in Inverness on the 14th April with a good response of 27 registered delegates. The morning session covered FIELD EXERCISE TESTING with the afternoon session focusing on SLEEP AND CPAP. Melanie Marshall from the ARTP's Education Committee also spoke about the ARTP National Assessment and plans to run the ARTP short course at Edinburgh in May, and the afternoon finished with a business meeting. A good proportion of those attending then continued discussions at a convivial local hostelry until late on in the evening which was both enjoyable and an excellent way of improving communication!

Dr Patricia Tweeddale receiving her ARTP Award at the Scottish Forum Meeting at Inverness in April

The meeting was generously sponsored by **Resmed UK, DeVilbiss and Deva Medical**, who were also present throughout the day to demonstrate equipment and give product information.

Plans are underway for the next Scottish Forum meeting in October 2000. The final programme is yet to be finalised but details will be available from :
Jill Fallen or Andy Robson both at the Respiratory Function Lab. Western General Hospital, Edinburgh
Tel : 0131 5371984

ASSOCIATION NEWS

BURSARY INFORMATION

Bursaries are available to ARTP members which can be used to support attendance at national ARTP, BTS/STS meetings. Other relevant respiratory meetings or approved training courses will also be considered.

Bursaries are available to student, associate and full ARTP members of any grade. They can be used for partial or total funding of registration, travel and accommodation costs for the whole or part of the meeting/course.

A questionnaire to members in 1998 highlighted several issues of concern, which the ARTP has tried to address. Members preferred to attend meetings with a colleague and joint applications are now considered. Also members were unsure of what was expected in the article for Inspire. To address this issue, the article does not necessarily have to be a piece of scientific research – it could be the results of a course project, patient case study, department procedure/protocol or some work on audit, quality etc.

ARTP BURSARY

Is provided from ARTP funds and is dependant on the inability to secure funding from another source. Approval is via the ARTP Executive Committee.

BTS BURSARY

The BTS generously provide financial support for ARTP members to attend BTS meetings. Application is via the ARTP Bursary Secretary but approval is via the ARTP/BTS Liaison Committee.

COMMERCIAL BURSARY

In the last few years **Resmed UK** have also kindly provided financial support for both ARTP and BTS meetings. There is the possibility of developing this to funding of international meetings in the future.

All bursaries are considered on the reason for the request and on the commitment to an article for Inspire.

For further details or an application form please contact :
Gill Butcher (Bursary Secretary), Cardiorespiratory Unit, Queen's Hospital, Belvedere Road, Burton-on-Trent DE13 0RB Tel : 01283 566333 Ext 5334

DECLARATIONS OF INTEREST

In accordance with the ARTP Constitution (April 1999) point 14.0, the ARTP Executive Committee members must declare Interests.

The following Executive members hereby state that they have obtained Interests, which are declarable during the financial year April 1st 1999 to April 1st 2000 :
Dr Brendan Cooper
Dr Sue Hill
Dr Adrian Kendrick
Dr Sue Revill
Mr Nigel Clayton
Ms Melanie Marshall
Mr Steve Scholey
Miss Julie Lloyd
Mrs Pat Mitchell
Mrs Evelyn Smith (past Executive member)
Interests that are declarable are for payments of over £100 in any financial year from:
- Commercial companies for professional services i.e. teaching
- Sponsorship, gifts, ex gratia payments
- Consultancy agreements with outside organizations

Specific details of Declaration of Interests for specific Executive members can, if necessary, be obtained by writing to Jane Caldwell, Honorary Secretary ARTP, Cardiorespiratory Dept, Rotherham Hospitals NHS Trust, Moorgate Road, Rotherham S60 2UD stating what is required and the purpose of the request.

NATIONAL ISSUES
CLINICAL PHYSIOLOGY
STATUTORY REGULATION OF PRACTICE

In June 1999 the Privy Council approved petitions from the Ambulance Paramedics, Speech and Language Therapists and Clinical Scientists under the 1960 Act for Professions Supplementary to Medicine to fill the remaining 3 of the 12 possible "Boards" to undertake the process of state registration for their professional groupings. All of these petitions were from coherent staff groupings who could be represented by a single professional umbrella organisation. The 1960 Act is due to be repealed soon and in its place secondary legislation will be crafted with the aim to modernise and update the current system including a requirement for assessment of continued competence (ACC). Integral to this secondary legislation will be the replacement of the Council for Professions Supplementary to Medicine (CPSM) and the establishment of the Health Professions Council (HPC). It is envisaged that this new legislation will provide the opportunity for other groups of staff to be included if they fulfil the requirements for statutory regulation of practice and that the HPC may be operational by September 2001.

Against this backdrop, as a Clinical Physiology group with representation from Audiology and Hearing Therapy, Cardiology, Gastroenterology, Neurophysiology and Respiratory Physiology was established. This forum has been working on a common agenda of establishing a case for statutory regulation of practice under the "new" secondary legislation and of developing an infrastructure for voluntary registration in the first instance. The Clinical Physiology group was formed to fulfil the requirement for an umbrella professional organisation, since it became evident that single disciplines would stand little chance of becoming state registered due to the small numbers involved – the combined group represents approximately 7,500 individuals in the U.K. A voluntary registration system, to demonstrate the ability of the profession to self regulate practice and to work as a single unified body, is a necessary pre-requisite to the formal consideration for the establishment of State Registration.

We have shown the Registrar of CPSM that the group has a *bone fide* case. We are optimistic that we will be in a position to present a petition that will be approved following establishment of a voluntary system for registration with all the necessary requirements for eventual approval of statutory regulation of practice (in much the same way as the Clinical Scientists have done). The existence of a voluntary register not only demonstrates the ability of a unified group to professionally regulate practice but enables registered practitioners to be recognised (and transferred) for state registration purposes, when a formal system is put into place. The Clinical Physiology group, with the support of the representative discipline professional bodies, is establishing the infrastructure for the formation of a "Registration Council for Clinical Physiologists (RCCP)" with limited company status. It is envisaged that this will be in place by June/July 2000.

Part of the process involves the setting of the educational entry to the independent practitioner level (i.e. the level which requires statutory regulation of practice). This is to be set eventually at degree level or equivalent and the Clinical Physiology group (which will become the new Registration Council for Clinical Physiologists) will be establishing the criteria for registration. In addition "grandfather" clauses for individuals who have been in post for many years and who may not hold the recognised qualifications but who can provide evidence of competent practice in all of the specified areas will be established.

It is important that all practitioners start to collate the evidence they have collected to support their practice and to work on producing an up to date curriculum vitae. In an attempt to disseminate information and requirements relating to the voluntary registration system a number of workshops are planned around the U.K. These will be multidisciplinary in nature and will be advertised through constituent professional body routes. It should be noted that for both the voluntary register and eventually for formal state registration purposes a fee is payable. The Registration Council for Clinical Physiologists is setting this at £12 in the first instance. Whilst membership of professional bodies is not mandatory for registration purposes it should be recognised that these bodies will provide the main source of information and will be the standard setting body for the constituent discipline.

In addition to the formation of a Registration Council, the Clinical Physiology group has established a liaison group with colleges and higher education institutes to more clearly define educational requirements particularly for the degree programme. Such programmes in the future will need to be formally approved and accredited since a first degree will be the expected attained level of education for the independent practitioner for statutory regulation of practice purposes. It is expected that professional body examinations will also be required to demonstrate evidence of competence.

These initiatives from the Clinical Physiology group have the full support of the Chief Scientific Officer of the Department of Health.

Please do not hesitate to contact your professional representative on these important issues. When more news is available this will be communicated to you in an attempt to keep you fully informed of the process.

This is an exciting time for science and technology within health care and we hope that statutory regulation of practice will be one that you welcome.

The representative of Respiratory Physiology on the Clinical Physiology Group is Dr Sue Hill. If you have any questions or would like any further information about this statement, please contact her:

Dr S L Hill, Consultant Clinical Scientist, Department of Respiratory Medicine, Lung Investigation Unit, 1st Floor Nuffield House, Queen Elizabeth Hospital, Birmingham Tel: 0121 697 8339

"ON THE BLOWER" - Manufacturers News

1. Manufacturers Liaison

Mr Steve Thomas - the Final Blow?

Perhaps the most disgusting exhibition of fraud seen in the respiratory field for many years has finally been brought to justice with the conviction of Mr Steve Thomas of the **Friday Medical** company for his NIPPY machine fiddles exploiting Papworth Hospital as reported in the Daily Mail and other national newspapers.

What makes this crime so particularly unpleasant is the risk at which patients were put with potentially unreliable machines all for the sake of greedy profiteering. With his loud attire and forceful pedalling he presumably felt quite comfortable cheating some of the more infirm and vulnerable patients in our care. Brave man!

We are all affected by such a crime so close to home. All of us will now re-check our tendering bids, question our purchasing patterns and consider carefully "freebies" offered by manufacturers etc. Manufacturers will doubly check they are not being seen to be fraudulent and undoubtedly the checks and balances of fair trading will be revisited no doubt adding to the beaucracy of ordering. I am only glad that we know Mr Thomas is a convicted criminal and none of us ever have to do business with him again.

It is unfortunate that **B&D Biomedical** are still suffering from the fallout of this case, and it is important to note that they have been exonerated of any involvement with the fraudulent practice of Thomas. The NIPPY ventilator is a good work horse of nasal assisted ventilation, and we can only hope its continued use is the only positive (pressure!) outcome of this tacky and sad story. Friday Medical is now presumably closed for the weekend. Let's hope it's a Bank Holiday weekend!

2. Trade Stand

Lung function equipment

I see **Mallinkdrodt** have entered the spirometer market place with their *Simplicity* (presumably without wings!) spirometer which was launched in the UK at COPD2 Conference in Birmingham. I have doubts about the rumour that it only works for one week per month! What with the **Ferraris** *Jurex* sleep system, globalisation of products has more problems than we think!!

I was sent a sales presentation CD from **Ferraris** which I believe to be widely circulated throughout the world. I was pleased to see that **Morgan Medical** are advertising the CPL system using the ARTP Winter 1999 Meeting slogan "Setting the Standard". However, they amusingly have added "Again" to the slogan. I was left perplexed wondering when they had set the standard the first time - was it the MDAS software, the earthing fault on the Benchmark or Hogben Shuffle at the ARTP Winter meeting?!!! I was less pleased to see the use of an Inspire article on SNIP by Laura Watson without acknowledgement or copyright permission from ARTP. We advise all manufacturer's to observe copyright law (both hard copy and digital) with regards to any ARTP publication in future.

I picked up a handout from the **MicroMedical** stand which very directly attacks an advert from **Vitalograph** regarding their 2120 hand held spirometer base station. It is interesting that claims are made by both sides without substantial scientific evidence - in this case regarding infection control. Whilst most ARTP members would see through the commercial posturing, there are many spirometer users who would easily be misled by arguments put forward in this way. We would like to see more positive advertising techniques by all manufacturers, and would further prefer commissioning of trials in lung function departments throughout the UK.

I am regularly asked now which full testing systems are available in the UK. To save me a few return phone calls I shall list most of the companies who sell lung function systems:

Beaver Medical Products	Tel: 01604 499427	MedGraphics agents
Erich Jaeger Ltd	Tel: 024 7643 8300	Jaeger manufacturers
Ferraris	Tel: 01634 373860	Collins, Zan, Morgan agents
EME SensorMedics	Tel: 01273 645100	SensorMedics agents
Pulmolink	Tel: 01233 713070	Medisoft agents

There was a recent scare regarding Bleomycin and nitrogen washout testing which suggested that the drug in the presence of high oxygen concentrations can cause lung damage. This emerged from the Australian Therapeutic Goods Administration Bulletin (Issue 41-1/00, May 2000). SensorMedics Corporation have issued a statement stating that *"there is little if any substantiated risk as purported"* to this potential problem. I can't help feeling that a little bit of commercial skulduggery is behind this story. I will keep you posted if I hear any more on it. Meanwhile it should be business as usual.

Nasal assisted ventilation (CPAP, NIPPV, BiLevel, etc),

There have been some new innovations seen on the nasal mask front recently. **Respironics** have introduced the *Simplicity* (again, without wings!!!) nasal mask which fits on the tip of the nose. It would be ideal for someone with a nose like Zoe Wanamaker and claims to be light and comes in two sizes. Its list price is £95.00 although reductions are available as an introductory offer.

I note **Sunrise Medical** have had some changes in personnel in the UK. I'm not sure what the fallout from this will be, but I hope we will still see the good range of DeVilbiss CPAPs and nebulisers in the market place.

A new company **Nuwyn** has set up in the UK as agents for Weinmann the German healthcare company. The company sells the complete range of emergency medicine devices (CPAP machines, capnograph, oximeters, oxygen concentrators, oxygen conservation devices, etc.) but of more interest to ARTP members is the Somnomask which has a nice ball socket connection and comes in L/M/S sizes and a unique noise suppressor the Somnowave. Prices of masks are from £54, and the Somnowave at £30. The masks work with most standard headsets, so are well worth a try. Tel: 0118 973 2564 Email: nuwynnltd@cs.com

I have recently bought some *Autoset T CPAP* machines from **Resmed**, but in the ordering process our hospital was told to my surprise that all servicing of machines would take place in Australia! Streuth Sheilah!!! Fortunately, the company will supply a loan machine and only charge £15 for the carriage. Presumably with the excellent sterling exchange rate the parts should be much cheaper than in their list prices. Will the customers see this saving? Keep the prices down under guys.

Finally, I have been reviewing some early data from a recent survey of lung function systems in the Trent region. It appears that when calculating predicted spirometry, volumes and gas

transfer values overall only 60% of equipment gets it right - with the best centres only achieving 88% correct values. I believe the West Midlands audit has similar results and we hope to publish and discuss these later into next year. Meanwhile, we need to work with manufacturers to improve the standards.

Pharmaceuticals

My awareness was raised at a recent respiratory meeting of the long-acting beta2 agonist *Foradil* (formetrol fumarate) from **Novartis**. It has a fast onset action like salbutamol (1-3 minutes) but is long acting with a duration of about 12 hours. Its safety profile is claimed to be similar to salbutamol. It comes as 12 microgram MDI or dry powder formulation. Its performance and efficacy is similar in most respects to 50 mcg as *Serevent* (salmeterol) from **Allen & Handburys** in patients with reversible airways obstruction. It presumably competes in the market place with *Oxis 12* (eformetrol) from **Astra-Zeneca**.

Relatively new to the market place is *Seretide* (salmeterol/fluticasone propionate) from **Allen & Hanburys** which has been formulated to treat previously poorly controlled asthmatics who are on low dose inhaled steroids. This combination long acting beta agonist with corticosteroid is allegedly the cheapest treatment at the lowest dose (£19.50 Seretide 50) than the competition (beclomethasone with salbutamol) which costs £33.54 for equivalent efficacy. Seretide comes as Seretide 50, 125, and 250 which is the fluticasone dose in mcg and all containing 25mcg salmeterol. It is known that **Astra-Zeneca** and other companies are also producing combination bronchodilator/steroid inhalers for release in the near future.

Miscellaneous

Anthony Phillips (seen dancing with Miss Elaine Eous at the winter meeting - hence in this section!) informs me that **Air Safety** have moved manufacturing to the town with the short fat hairy legs - Morecambe, Lancs. Apparently there is a filter lane on the M6 to Morecambe! Order enquiries should be sent to; Air Safety Ltd. Vickers Industrial Estate, Mellishaw Lane, Morecombe, Lancashire, LA3 3EN. Tel: 01524 388696, Fax: 01524 33386 or email: info@airsafetymedical.com

I have heard rumours of a new blood gas machine about to be launched onto the UK market but I promised I wouldn't divulge details until the official release took place worldwide. Suffice to say it should be a wonderful, wonderful machine!

The Icelandic company **Flaga**, have just launched their mini-portable sleep study system the nine-channel *Embletta PDS*. (it sounds more like it should be an Italian scooter!) for details and a trial I suspect it would be best to contact Lyn Davies at **SSI** on 01865 358860. If its anything like their Embla sleep system, it is well worth a look.

Protech Medical Ltd. continues to supply printer supplies, quality control samples and other accessories for blood gas machines at generally cheaper rates than the manufacturers of the gas machines themselves. They are worth contacting, although many of the blood gas machine manufacturers argue that their QCs aren't as good/reliable as their own. (Well, they would wouldn't they!) Try them on Fax: 01457 856198 or Email: Protech.medical@btinternet.com

3. Moans of the month:

I have a variety of whinges which all centre around poor customer service. The first is with **EME SensorMedics** who have taken an inordinate amount of time to sort out predicted limits, report formats, modifications to the cart, a cable to link the Marquette heartrate to the VMax and sending all the software for our *VMax29*. Sensormedics in the USA and Europe used to be a much more dynamic company with experts on hand to sort out problems within hours. This cannot be said to be the case for the UK outfit. Come on guys, get your act together - you'll be losing market share rapidly unless you do!

Bayer, who have taken over **Chiron** blood gas machine business have offered our department a very shoddy service recently. Has anybody else noticed that they do not uphold the "before 11:00 a.m. same day engineer call-out" service as part of the top of the range 4 Crown service agreement? We have had 3 oxygen electrodes fail (Ooh, sounds like a faulty batch., sir!) within the last 4 months and an annual preventative maintenance check done several months later even though it should have been part of the service agreement. Should they re-name themselves Montego Bayer - not after the exotic location, but the crap car?

4. Complaints Database and WatchDog.

With the proposed launch of the ARTP Web-site in August, we will be re-thinking how the ARTP Watchdog will work. We will have the perfect opportunity for members to build an independent database of faults and problems with equipment and poor service from manufacturers. We will still run Watchdog in On the Blower, and we would still like conventional mail to be sent regarding problems to those not yet on the internet. We will arrange that only members can put articles on the website in case rogue messages are created to damage the name of particular companies.

Our WebSite Coordinator, Keith Butterfield (Stourbridge) has sent a bug fix for the **Morgan MDAS V.4** software. I don't think this will be the last software change because the recent audit in Midlands has shown that Morgan predicted values are inaccurate in MDAS V4. (incidentally - none of the "big four" lung function systems calculated predicted values 100% correctly.) Back to the Bugfix:

Use Notepad to edit MDAS.BAT in the (C:\MDAS sub directory)
Insert the following line after @echo off ... (which is the first line)
Echo bugfix\debug.txt

(WARNING - remember altering batch files can cause catastrophic problems if you don't know what you're doing!!!)

MicroMedical have sent me an information sheet regarding BTPS correction to the rotating vane spirometers in their *MicroLab* machines. They state that the MicroLab will read 2% higher on ambient air from a calibration syringe because of a correction factor built into the software. They claim that air passing through a turbine does not cool and contract and only needs a small correction factor to be accurate. They quote the acceptable range for a 3.00 litre syringe to be between 2.97 and 3.15 litres. They haven't quoted a published reference paper for this but I believe they have data on file for those who are interested.

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 correspondance at this stage.

Dr Brendan Cooper, (ARTP Manufacturer's Liaison Officer) Lung Function Department, Nottingham City Hospital, Nottingham NG5 1PB. DDI/FAX (24 hours): 0115 840 2615

ARTP WEB SITE ..... LATEST NEWS

REPORT BY KEITH BUTTERFIELD

By now most of the membership should have access to the Internet either via the NHS Net or at home. If you are not I urge you to get connected – there is a wealth of useful information out there waiting to be found !

With Continuous Professional Development you ought to be setting aside some time each week for study and, so long as you are not accessing the Steps fan club site or hunky-men.com, serious surfing counts as research. Now it is possible to access Medline (Pubmed), the Department of Health **(http://www.doh.gov.uk)**, NICE **(http://www.nice.org.uk)**, and other information archives from the comfort of your own department without having to trudge all the way over to the Medical Library. If you are a BTS member you can now read Thorax **(http://www.thoraxjnl.com)**, current and back issues, on line. A reference site I have found particularly interesting is the National Guidelines Clearing House **(http://www.guideline.gov)** which has the American recommendations (downloadable) on, not only respiratory, but many other topics.

Now we are pleased to announce, the ARTP has a presence on the web.

The ARTP website **(http://www.artp.org.uk)** features :-

- **Contact details**
- **Forum**
- **Education**
- **Membership**
- **Inspire**
- **Vacancies**
- **Web Links**
- **File Archive**

Contact Details

Addresses (postal and e-mail) for the main committee members and other functions of the ARTP can be found on this page.

The ARTP Forum

This is an exciting expansion for the ARTP enabling rapid access to the combined knowledge and experience of the entire membership. It can be used for problems, protocols, equipment, peculiar case histories, just about anything. Please be aware that, as with all e-mail communication, confidentiality can never be assured and care should be exercised when posting material of a sensitive, or potentially libellous nature.

Those of you who have supplied e-mail addresses on your membership renewal form will already have been subscribed to the ARTP Forum. If you want to change your e-mail address, add another e-mail address (a maximum of 2 addresses per member are permitted – work and home) or to be removed from the Forum, visit the Forum page where you will find instructions. You should read the rules and FAQ (frequently asked questions) accessible via the Forum web page before you start contributing to the Forum.

Education

Regularly updated with details of educational opportunities including courses and meetings, national and international and, of course, details of the ARTP assessments.

Membership

Membership benefits are listed and New and Renewal Membership forms can be downloaded.

Inspire

About the magazine – it is hoped that eventually we will be able to publish an online version of the magazine and searchable archives of past issues.
You can also now submit articles for 'Inspire' via e-mail to **inspire@artp.org.uk** (in Microsoft WORD format).

Vacancies

Regularly updated with vacancies from the ARTP circulation.

Web Links

A compilation of useful links on the internet.

File Archive

A downloadable file archive containing files that may be of use to members.

Future Expansions

The new Website is only the beginning of what we hope will become an invaluable service to the membership. At the moment the site is fully open to public access but as it develops we will be introducing privileged access to parts of the site for members only. Some of the above functions will be moved, and new ones introduced to the restricted access area which will be synchronised with the membership database.

Any Comments

The ARTP website editorial board is :-

Keith Butterfield	Head of Technical Services	Lung Function Unit Wordsley Hospital
Steve Scholey	Senior Chief Technician	Chest Unit Pontefract General Infirmary
Adrian Kendrick	Clinical Scientist	Respiratory Dept and Sleep Unit, Bristol Royal Infirmary
Sue Revill	Research Clinical Scientist	Dept of Respiratory Medicine, Glenfield Hospital
Nigel Clayton	Chief Technician	Lung Function Laboratory Wythenshaw Hospital
Gill Butcher	Senior Chief Technician	Cardiorespiratory Unit Queen's Hospital, Burton

If you have any comments about the website that you would like to pass on, or suggestions for features that you would like to see introduced, e-mail **webmaster@artp.org.uk** or contact a member of the editorial board.

THE ANNUAL GENERAL MEETING OF THE ASSOCIATION FOR RESPIRATORY TECHNOLOGY & PHYSIOLOGY, HELD AT HANOVER INTERNATIONAL HOTEL, DAVENTRY, ON 12TH FEBRUARY 2000.

EXECUTIVE MEMBERS PRESENT

Dr Brendan Cooper (BC) Chairperson
Miss Julie Lloyd, (JL) Honorary Treasurer
Mrs Jane Caldwell, (JC) Honorary Secretary
Mr Steve Scholey (SS)
Ms Gill Butcher (GB)
Mrs Melanie Marshall (MM)
Mr Nigel Clayton (NC)
Mrs Pat Mitchell (PM)
Mrs Angela Evans (AE)
Dr Sue Revill (SR)
Dr Adrian Kendrick (AK)

Approximately 125 ARTP members were present at the AGM, which opened at 11.00am.

EXECUTIVE MEMBERS APOLOGIES FOR ABSENCE

Dr Sue Hill (SH)

(No other apologies for absence were received from the membership)

Dr Brendan Cooper, Chairperson of the ARTP, welcomed all present to the Daventry "Millennium" ARTP annual general meeting. He thanked the membership for their evaluation of the previous ARTP meeting in Doncaster, and confirmed that their appraisal had duly been incorporated into this meeting's format.

In his introduction he discussed some of the major events of the last 1000 years including the birth of the ARTP, less than 30 years ago. He confirmed that the role of the ARTP has evolved over the years into a supportive, quality team player, along with other team healthcare workers, within the medical field. With quality as a pointer, he then introduced the Executive Committee: Julie Lloyd, Honorary Treasurer, Jane Caldwell, Honorary Secretary, Steve Scholey, Membership Secretary, Sue Revill, Editor of Inspire, Pat Mitchell, Meetings Organiser, Melanie Marshall, Education Secretary, Gill Butcher, Public Relations Officer and Adrian Kendrick and Nigel Clayton, Executive Officers. Sue Hill, Past Chairperson, was unable to attend this meeting. The Executive Committee had had one or two changes during the last year, which included the loss to the Committee of Evelyn Smith, Executive Officer and Claire Thomas, Education Chairperson. Specific thanks were expressed to Claire for her involvement with and organisation of the National ARTP/BTS Examinations. Angela Evans was welcomed onto the Committee to take on the role of Educational Chairperson. Brendan stated that the Executive Committee had tried, over the latter year, to be more democratic, improving and opening communication with the membership, as well as networking with other leading professionals. A review of the key achievements obtained in 1999 was then briefly discussed. These included: ARTP handbook published, with special thanks expressed to Sue Hill and Claire Newall (Birmingham) for her help with the final draft version; Proceedings of 25th Anniversary Meeting published; working groups on state registration and occupational standards established; improved partnership with BTS; stronger links with Manufacturers in developing training; implementation of the ARTP/BTS National Assessment in Spirometry (20 centres having already registered); maintenance of a strong financial basis; as well as moves towards an establishment of an ARTP Website and a voluntary register of ARTP/BTS lung function practitioners have also been partially achieved. Brendan stated that these achievements had taken considerable efforts from all involved and many lessons had been learnt for future objectives. The Executive Committee would endeavour to continue with its objectives for 2000 and would appreciate practical support and help from the membership and urged those present to complete the relevant form in the delegate bag and return to Jane Caldwell, Secretary, specifying their support, regardless of how small.

One unexpected but valuable development in 1999 had been the establishment of the Scottish Forum. Specific thanks went to Andrew Robson and Jill Fallen (Scottish Forum representatives) and Gill Butcher (Executive Committee representative) for their tremendous support in establishing this regional group, which will ultimately improve the ARTP link with the Scottish membership; as well as promoting education and training.

In Sue Hill's absence Brendan briefly reported on state registration, stating that the Clinical Physiology Group had petitioned the CPSM in December 1999 and that this subject would continue to be pertinent to the ARTP with a voluntary register for lung function practitioners being introduced in the near future. The Heads of Department meetings in Edinburgh, London and Birmingham had been particularly useful to the ARTP, providing information and feedback about specific doubts, concerns, aspirations, expectations and perceptions of the state registration process. This information would be duly fedback to the Clinical Physiology Group.

ARTP constitutional issues were discussed at this stage on the AGM. Brendan reported that a Constitution Committee had been formed to revise the constitution into the shape required. He thanked those Executive Committee members concerned with this revision and expressed specific thanks to Trefor Watts (Walsall) for his thorough contribution on this work. Once this revised draft had been formulated the membership had been asked for comments, with the subsequent final draft being circulated and voted on by postal vote. The Charities Commission had specifically asked that in addition to the postal votes received, a formal vote should occur at this meeting on the revised changes. Voting thus took place on:

Vote 1. To accept the ARTP name change from Association of Respiratory Technicians and Physiologists to Association for Respiratory Technology and Physiology. (VOTE ACCEPTED BY MAJORITY VOTE).

Vote 2. To accept the revised ARTP Constitutional changes. **(VOTE ACCEPTED BY MAJORITY VOTE).**

Vote 3. To accept the revised Discipline and Code of Conduct. **(VOTE ACCEPTED BY MAJORITY VOTE).**

Vote 4. To accept that the Declaration of Interest by Executive members could be biannually instead of quarterly. **(VOTE ACCEPTED BY MAJORITY VOTE).**

Brendan thanked the membership for their support on these constitutional issues. He then discussed the Department of Trade and Industry Coalminers claims which had been a huge

issue for the ARTP during 1999. He stated that the ARTP had worked hard to meet with companies to voice our professional opinion on who should make the measurements, advising on standards for a quality service and to voice our opinion and report on poor practice thus defending our profession. Major developments had been achieved in this area and would continue in 2000.

The Certificate in Spirometry would help in maintaining standards of service delivery and Brendan happily reported that the first 20 nurses had enrolled on the course. This opening would be available for specialist nurses and drug company personnel in the near future; thus confirming the role of the ARTP in setting the standards and leading the field.

Brendan then formally asked the Executive members concerned to give their reports to the membership.

a. Financial Report, Miss Julie Lloyd.

Julie Lloyd presented the financial status over the last 5 years to the membership present. Julie explained that apart from the 25th ARTP meeting at Birmingham the income versus expenditure had been favourable over the five years. Julie then gave a breakdown of both income and expenditure, the usefulness of both the VAT registered account and the Training and Educational account; and the over all current healthy financial status. The membership were then duly asked to vote on acceptance of the Tyrell's financial report for 1998-1999 which the membership had received via post. **(VOTE ACCEPTED BY MAJORITY VOTE).**

b. Membership Report, Mr Steve Scholey.

Steve Scholey reported that the membership total had continued to improve over the latter years, and currently stood at over 400. He stated that there was a particular increase recently in new members joining the ARTP. He welcomed these new members on behalf of the Executive Committee and reminded the non-renewal members to renew their membership as soon as possible. A reminder would be sent to these members in due course. Steve Scholey took this opportunity to thank his colleague Gillian Boar, at Pontefract, for her help in maintaining the membership database. Gillian had recently resigned from this role.

c. *Inspire* Report, Dr Sue Revill.

Brendan took this opportunity to thank Sue for her contributions as Inspire Editor as Sue was stepping down from this role in the near future. An *Inspire* Sub group would probably replace her role and anyone interested in joining this group should contact either Sue Revill or Jane Caldwell.

Sue Revill reported that the next edition of *Inspire* would be forwarded to the membership in the near future with another edition scheduled for the summer. She reminded the membership that any articles of interest for the summer edition, should still be forwarded to her prior to the deadline, which would be specified on the next edition. Sue also reported that a sub group of members had met at this meeting to discuss the initiation of an ARTP Website and she confirmed that it was hoped that this would be up and running later in the year. All current members would be able to access the site and obtain the latest information on training and education, state registration, forth coming events and meetings as well as job adverts. Members were urged to review their *Inspire* Journal for further details on this issue.

d. ARTP/BTS Liaison Report, Dr Brendan Cooper (on behalf of Sue Hill).

Brendan reported that the ARTP had continued to develop strong links with the BTS and through the forth coming year this liaison would strive to work together on guidelines for practise, state registration and the role of the Clinical Physiologist as well as updating and improving educational links. An important break through with this liaison group is that it will feed directly into the BTS Executive Committee, which will reinforce that the ARTP are the experts in measurement of lung function. Both the ARTP and the BTS liaison representation had been reviewed and an agreement to meet at least twice a year had been formulated. A joint BTS/ARTP Symposium would occur at the Summer BTS at Harrogate.

e. State Registration Report, Dr Brendan Cooper (on behalf of Sue Hill).

In Sue Hill's absence, Brendan reiterated that major progress had been achieved on this important issue. Sue had formed strong links with our fellow professionals and as Chairperson for this Clinical Physiology group she would continue to represent the ARTP memberships interest. An update on progress would appear in due course in *Inspire*.

f. Education Report, Ms Melanie Marshall.

As acting Chair for the Education Committee, Melanie reported that 15 candidates had been successful in the 1999 ARTP/BTS National Assessments. She confirmed that it was anticipated that a greater number of applicants were anticipated to undertake the assessment in 2000 as she had forwarded approximately 200 applications to the membership. She also stated that at this meeting, the ARTP Executive had an Educational Stand within the Manufacturers Hall, which members could visit and ask Executive Committee members any specific queries or questions about the National Assessments. She thanked Claire Thomas on behalf of the membership for this Stand suggestion. Melanie stated that in the coming year the ARTP would continue to run the Short Course and the Advanced Respiratory Course, details of which would be in the forthcoming *Inspire* Journals.
The presentation of the ARTP/BTS National Assessments then followed. The Certificates were presented by Dr Martin Miller, BTS representative and Dr Brendan Cooper ARTP representative. The following candidates were successful:

Emma Barnett, Wythenshaw Hospital	**Merit and Sally Gough Award**
Melinda Bennett, Glenfield Hospital	**Merit**
Beverley Brittain, Papworth Hospital	**Merit**
Faye Colbert, Queens Medical Centre	**Merit**
Mathew Cobbold, Addenbrookes Hospital	**Merit**
Catherine Corbie, Pontefract General Infirmary	**Merit**
Alana Edwards, Northern General Hospital	**Merit**
Lindsey Parkinson, Rotherham Hospital	**Merit**
Zoe Prangnall, Sheffield Royal Hallamshire Hospital	**Merit**
Claire Thoel, Doncaster Royal Infirmary	**Merit**
Bridget West, Derbyshire Royal Infirmary	**Merit**
Suzanne Whiteford, Monklands Hospital	**Merit**
Debbie Woodcock, Royal Devon & Exeter Hospital	**Merit**
Cathie Gillooy, Gloucester Royal Hospital	**Pass**
Lesley Mattock, Sheffield Royal Hallamshire Hospital	**Pass**

Following the presentations of certificates, Brendan thanked all the Executive Committee members for their reports. He then continued by presenting his summaries and future objectives for the ARTP.

Brendan confirmed that the year ahead would be a busy one with a lot of work scheduled. The main objectives of the ARTP would be to increase the membership; continue to maintain a solid financial basis; improve links with other professionals including the BTS and the Manufacturers; appoint a paid part-time Administrator to help with the ARTP paper work; establish a Website for membership access; move state registration forward; continue to link directly with the Heads of Department via regular meetings; meet the demands of the National

Assessment requirements and change the educational and training structure to meet state registration requirements; as well as continue to provide the opportunity for members to attend courses and meetings such as this one, which had proved to be an excellent meeting.

In summary, Brendan reflected on the past year's objectives again and the achievements of the ARTP Executive Committee. He stated that with respect to the DTI Miners compensation, some battles had been lost along the way, but standards and striving for quality had been maintained. He reported that the ARTP now had a good working relationship with Healthcall and that the ARTP would continue to work together with Healthcall to maintain standards and quality. Although it had been a difficult year he stated he was proud to represent the ARTP and looked forward to the coming years challenges when the ARTP would again lead the field. He thanked all those present for their attendance at this meeting and welcomed their continued support in the future.

The ARTP Annual General meeting closed at 12.05pm.

Minutes taken by Jane Caldwell, Honorary Secretary of the ARTP.

ARTP MILLENNIUM MEETING AT DAVENTRY

A REPORT BY MRS. P. MITCHELL, ARTP MEETINGS ORGANISER UNIVERSITY HOSPITAL AINTREE, LIVERPOOL

This Millennium meeting was held at the Hanover International Hotel at Daventry, from Thursday 10th February to Saturday 12th February 2000. The Hanover Hotel was chosen as this year's venue after several other venues had been visited and rejected. One of the main points of the feedback from delegates after the Doncaster meeting, was that members wanted a venue that could house both the exhibition and the conference and also provide accommodation and a Conference dinner and disco. Exhibitors' various requirements also had to be considered as funding and sponsorship from the companies enabled the meeting to be a viable event. The Hanover was chosen as it best fulfilled our needs, it is centrally located, had easy access for exhibitors' equipment and with a good standard of accommodation and food plus a health spa and night club, it fitted the bill.

A great deal of pre conference planning and organisation is necessary to hold a meeting of this calibre, over 230 delegates and 21 exhibitors attended during the three days. Planning for this meeting started soon after Doncaster. Many people, speakers, chair persons, ARTP executive committee members, exhibitors, sponsors, AV Technicians and especially Moira Wilson and her staff at Universal Conference Consultants worked tirelessly throughout the year to enable this meeting to happen, but without ARTP members' enthusiasm and attendance this would all have been in vain.

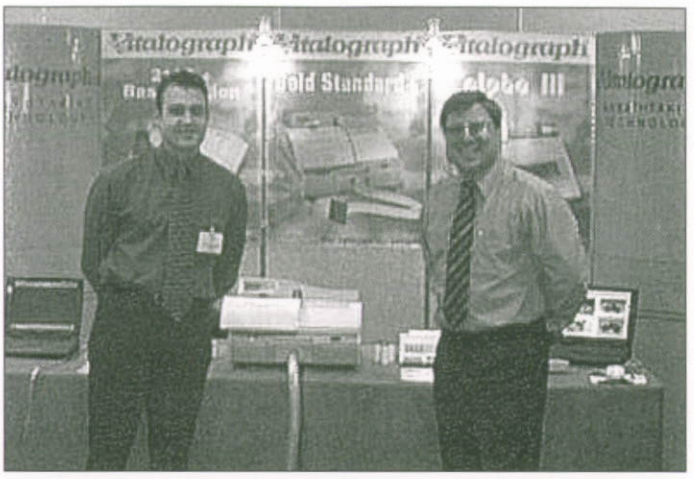
As with the last two years' meetings, a three day format was followed. The conference was opened on the Thursday evening by the Chairman of the ARTP, Dr. Brendan Cooper. Two excellent keynote speakers, Professor John Britton and Mr Rob Allcock started the evenings programme. Professor Britton's lively presentation on Smoking Cessation outlined the health problems associated with smoking, especially with regard to the Respiratory System. Smoking cessation strategies and Department of Health plans for the future of this important and controversial topic were discussed. Professor Britton stressed the vital role that health professionals could play in counselling and promoting smoking cessation to smokers. The second keynote speaker Mr Rob Allcock discussed Pulmonary Vascular Disorders. Methods of assessment of the patient, major abnormalities and the background Physiology and Pathology of this relatively rare disease were presented. A stimulating start to this year' s meeting. The exhibition was then opened for the duration of the conference and some exhibitors let their imagination 'fly' and wore fancy dress to draw attention to their product!

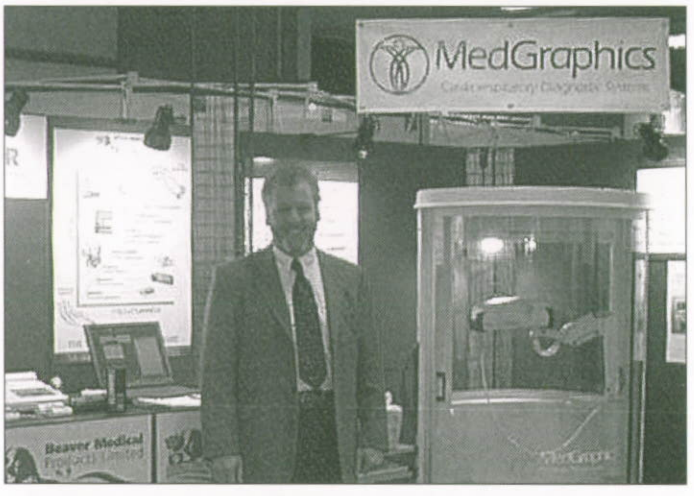
Time to relax . . . . the happy faces of some of the Executive Committee.

Anaerobic thresholds achieved in 'Cats' Nightclub.

Friday's programme was a very intense and diverse one. The morning session was opened by Dr. Brendan Cooper who welcomed delegates and manufacturers. The first session was Respiratory Medicine and Allergy. Dr. Sherwood Burge presented Allergy and Atopy. Mrs Samantha Walker discussed the role of Skin Testing and Mrs Angela Evans presented the use of Bronchial Challenge as a clinical tool. The session gave a full and informative insight to allergy, its significance and methodology of assessment.

ARTP Education Stand





The next session of the morning was a symposium on Thoracic Surgery, which provided an update of assessment for Lung Transplantation presented by Dr Adrian Hill. Dr. K.G. Lee gave the Anaesthetists view of Lung Function and an update of Keyhole Thoracic Surgery was discussed by Mr. David Waller. This was an extremely informative and entertaining symposium and question time at the end produced a lively debate between speakers.

An Exercise Symposium, sponsored by Morgan Medical Ltd. began the afternoon programme. Dr, Charles Gallagher spoke on the role of Cardiopulmonary Exercise Testing. Dr. Susan Shirreff presented Substrate Metabolism during exercise and Dr. Alison McConnell's Assessment of Respiratory and Skeletal Muscle gave a full and comprehensive picture of the current practices in exercise Physiology.

For the first time in several years a poster session was incorporated into this years schedule. Eighteen abstracts were received and these were displayed in the exhibition hall for the duration of the meeting. Three abstracts were chosen by the executive committee and the authors were invited to give a ten minute presentation. These were:

1. Roger Carter on a comparative study between single breath lung volume measurement and multibreath/body plethysmography
2. David Fishwick on respiratory symptoms and lung function changes in Welders
3. Claire Newall on the use of the incremental shuttle walking tests in assessing patients for cardiac transplantation

EME sponsored a days visit to the Formula 1/Bennetton Human Performance Laboratory at Silverstone for the most relevant poster. This trip was awarded to Katrina Oates (Liverpool). The posters were of a very high standard and this session enabled members of the Association to have an opportunity to present their work and current research projects and enabled delegates to appreciate the high calibre of work achieved by members.

Nasal Assisted Ventilation was the topic for the final session of the day. As an increasing number of delegates are now involved with these procedures it was an extremely pertinent session. Dr. Paul Plant outlined the use of acute NIPPV in the hospital situation. Dr. Rob Angus spoke of the need for guidelines for the use of NIPPVs and of members involvement with this relatively new technology. Dr. Brendan Cooper gave his views on the role of Assisted Ventilation in the home. The days sessions closed at approximately 5.30pm.

In the evening a Millennium dinner was held and over 200 people attended this function. Brendan Cooper aided and abetted by Steve Scholey, took the opportunity to use his after dinner speech to gently rag most of the manufacturers. All good fun! Various presentations followed, a gift of a cut glass bowl was made to Dr. Patricia Tweeddale in recognition of all her work for the Association. Unfortunately Dr. Tweeddale was not able to be present so it was received on her behalf by one of her colleagues. Flowers in token of appreciation were presented to Dr. Sue Revill to thank her for her mammoth efforts in the job of editing Inspire. Moira Wilson from UCC and I also received floral displays (thank you my flowers lasted nearly four weeks). A disco in the Cats nightclub then followed the dinner and the revelry continuing into the early hours of the morning.

Sleep Breathing Disorders was the first session on Saturday morning. Dr. Rob Davies explained the problems of assessing Sleepiness and Wakefulness, Dr. Adrian Kendrick presented CPAP Titration and Dr. Martin King discussed Screening Studies for Sleep Disorders. Methods of scoring patients perceptions of sleepiness and wakefulness are valuable tools to assess relevant treatment and compliance with equipment is a major factor in the treatments' potential success.

The Annual General Meeting was then held (please see Minutes of the meeting in Inspire). The final session of the morning and of the meeting, was a Symposium on Airways Management. Flow measurements were explained by Dr. Martin Miller, the use of Impulse Oscillometry in diagnosis and assessment in Bronchiolitis Obliterans was presented by Mrs Sandy Jack and Dr. Ian Pavard posed the question of Dr. No and Co, will they solve the inflammation mystery? This session highlighted the importance of making accurate measurements, the use of new technology and developments in assessing and treatment of airway inflammation. It was a very exciting session with which to finish the meeting.

Planning is already taking place for next years meeting so if you haven't already filled in your evaluation sheets, please do so, in order that your views and ideas can be incorporated into next year's meeting.

ABSTRACTS FROM THE ARTP WINTER MEETING DAVENTRY 10th - 12th FEBRUARY 2000

CAN A SINGLE BREATH DILUTION LUNG VOLUME MEASURMENT (NITROGEN RECOVERY) GIVE AS GOOD AN ESTIMATE OF LUNG VOLUME AS MULTIBREATH HELIUM OR BODY PLETHYSMOGRAPHY

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The Transflow (Morgan Medical, Kent, England) is designed as an open circuit system to provide a method of lung volume determination utilizing single breath nitrogen recovery (NR). We have validated this technique against body plethysmography (BB) and multi-breath helium dilution (MHD) in patients according to the degree of airflow obstruction based on the level of the FEV_1 (n=50 in each group). In the patients with no airflow obstruction, there was good agreement between all methods of measurement. Bland and Altman analysis [NR v BB mean difference – 0.03 litres (SD 0.13), NR v MHD mean difference – 0.02 (0.09)] with the differences between the various methods evenly arrayed around zero difference; this relationship was similar at all values of TLC. There was a tendency for the difference between methods to increase with increasing airflow obstruction although this did not reach statistical significance in patients with mild or moderate airflow obstruction. In the patients with severe airflow obstruction the NR volume (Mean 6.29 (1.16) was significantly lower than both HMD TLC [6.73 (1.22); Mean difference - 0.44 (0.40); $p < 0.05$] and BB TLC [7.23 (1.40) Mean difference – 0.94 (0.69); $p < 0.01$] but did give a better estimate of the true lung volume than a single breath helium dilution alveolar volume (V_AHE 5.49 (1.22); $p < 0.01$). Regression analysis showed there was a significant curvilinear relationship between the degree of airflow obstruction and the difference between the NR alveolar volume and MHD TLC [Difference = 0.62 $Log_n(FEV_1/VC\ \%)$ – 2.63litres; correlation coefficient 0.64] and BB TLC [Difference = 1.03 $Log_n(FEV_1/VC\ \%)$ – 4.36 litres; correlation coefficient 0.69].
In conclusion, there is good agreement between the NR method and TLC by MHD and BB in patients with moderate, mild and no airflow obstruction. There is, however, a tendency for the difference between NR and the other methods to increase with increasing airflow obstruction that becomes significant at more severe levels of airflow obstruction. The NR lung volume gives a better estimate of the total lung capacity than the single breath helium dilution alveolar lung volume in patients with more severe airflow obstruction although this is still a significant underestimate compared to body plethysmography and multi-breath helium dilution.

ASSESSMENT FOR PROVISION OF NEBULISERS IN THE ROYAL HALLAMSHIRE HOSPITAL, SHEFFIELD

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Our policy in supplying a nebuliser for bronchodilating agents is that clear benefit must be shown compared to using a large volume spacer with a rebreathing technique. We also nebulise 2ml Normal Saline, to assess benefit from "humidification". The process takes a half-day.
26 patients (11m), mean age 63.4 years had nebuliser assessments as a clinical service during a thirty-month period. Using criteria of 15% improvement (minimum of 200ml) in Forced Expiratory Volume in 1 second (FEV_1) we find that 14 (53%) showed classical reversibility. Of the remaining 12, 7 showed a worthwhile (350 to 600 ml) and two a large (910 and 1180 ml) improvement in Vital Capacity (VC).
Only one of the eight people who did not improve FEV_1 by 100ml when given the drug via the large volume spacer subsequently showed improvement, that being to nebulised normal saline.
We have shown improvement in VC by spacer in 21 people (220 – 1450 ml), to subsequent humidification in five people (210 – 900 ml) and to nebulised bronchodilators in 5 (200 – 390 ml).
In conclusion "humidification" should not be overlooked when assessing the benefits of nebulised therapy. VC is also a necessary measurement.

CONSIDERATION OF STUDY-DESIGN WHEN ASSESSING PUBLISHED EFFECTS ON RESPIRATORY HEALTH

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RESPIRATORY FUNCTION UNIT, ROYAL HALLAMSHIRE HOSPITAL, SHEFFIELD

Papers examining non-malignant respiratory disease in steelworkers have been reviewed to determine factors contributing to the power of a study to demonstrate the effect of occupational exposure on the development of disease.
A MEDLINE search identified studies on steelworking and pulmonary disease. Further studies were traced from these papers. The design and analysis of each study was examined. Seven mortality studies (grouped according to length of follow-up) and twelve morbidity studies (grouped according to selection of controls) were assessed.
Studies with a long follow-up period or a cohort of older workers found a positive association between steelworking and mortality from non-malignant respiratory disease. Those with a short follow-up were negative.
Morbidity studies using controls working in separate enterprises found either a higher prevalence of respiratory symptoms, lower respiratory function or both. Longitudinal studies were able to show an effect over time from exposure that was not apparent from a cross-sectional analysis. Studies using controls from another section of the same working environment sometimes showed increased symptoms but none showed decreased respiratory function.
The ability of a study to demonstrate an effect on respiratory health is particularly dependent upon appropriate choice of subjects, controls and length of follow-up.

LABORATORY ASSESSMENT OF FITNESS TO FLY IN PATIENTS WITH LUNG DISEASE: A PRACTICAL APPROACH

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To identify patients with respiratory disease who may be at risk of developing respiratory distress during commercial air travel, a hypoxia inhalation test (HIT) can be performed. We report our experience of using such a test combined with an interpretation algorithm in a routine respiratory function laboratory. Nineteen patients were studied. Baseline oxygen saturation (SaO_2) was measured using a pulse oximeter. If SAO_2 was < 90% no HIT was performed and the patient was assessed as unfit for air travel. If baseline SaO_2 was > 90%, an HIT was performed by the patient breathing through a 35% Venturi mask supplied with 100% nitrogen which reduced FiO_2 to 15.1 ± 0.2%. Results were interpreted using a locally derived algorithm and validation was attempted using a questionnaire to investigate subsequent symptoms during travel. All patients tolerated the assessment well. Fourteen patients were assessed as "fit to fly" with a further two patients 'fit to fly with supplemental O_2'.
Three patients were considered unfit to fly. Hypoxic response could not be predicted from either FEV_1 or pre-test saturation. Validation of such protocols is difficult, but the HIT may be a useful tool for predicting hypoxia during air travel in patients with chronic respiratory disease.

"PULMONARY REHABILITATION – TECHNICIANS CAN DO IT TOO!!"

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CARDIO-RESPIRATORY DEPT, NORTH MANCHESTER GENERAL HOSPITAL, CRUMPSALL, MANCHESTER M8 6RL
* PHYSIOTHERAPY DEPT

Pulmonary Rehabilitation has traditionally been the domain of the Respiratory Physiotherapist. We have developed a Pulmonary Rehabilitation Programme, around an experienced Respiratory Technician, which was run from the Physiotherapy Dept.

Over a period of 23 months, 35 patients successfully completed an 8 week Pulmonary Rehabilitation Programme. 30 patients performed shuttle walk tests pre and post rehabilitation, which showed an improvement from a (mean(SD)) shuttle walk distance of 151 (80) meters pre, to 197 (99) meters post rehabilitation. These results compare favourably with those published by an established programme at the Glenfield Hospital (Revill,SM et al. Thorax 1999; 54:213-222). Quality of Life, as measured by the Chronic Respiratory Disease Questionnaire, also showed an improvement post-rehabilitation.

I have found running a Pulmonary Rehabilitation Programme to be a very positive and rewarding experience, and have, hopefully, demonstrated that Healthcare Professionals, other than Physiotherapists can successfully run this type of programme (perhaps of significance due to the current national shortage of Respiratory Physiotherapists). I have found that Physiotherapy backup/input is, however, very important, particularly regarding patients with locomotor dysfunction.

IS INTERRUPTER AIRWAYS RESISTANCE (R_{int}) RELATED TO FLOW RATE ?

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UNIVERSITY HOSPITAL LEWISHAM, LONDON SE13 6LH

With a portable device, we measured airways resistance using the interrupter technique (R_{int}), during tidal breathing through the mouth (R_{intmp}) and the nose (R_{intnm}). We report on the relationship between the flow rate at which interruption occurs and (R_{intmp}), (R_{intnm}) and also $R_{intnose}$ (R_{intnm} - R_{intmp}). Mean and intrasubject coefficient of variation (c.v.) values were obtained at 0.05 l/s intervals between 0.1 and 0.9 l/s during inspiration (ins) and expiration (exp). Using multiple regression analyses for mean R_{int}, for flow rates of up to 0.2 l/s all regression lines were parallel with no significant slope for all types of R_{int} measurement and their c.v.s. Mean $R_{intmpins + exp}$ was 0.23 + 0.19 and $R_{intnmins + exp}$ was 0.30 + 0.31 $kPal^{-1}s$, respectively with a c.v. range of 14 – 21 %. For flow rates of 0.1 – 0.4 l/s the patterns were also similar for individuals mean R_{int}, with no significant slope for $R_{intmpins}$ nor $R_{intnoseexp}$. However, significant though trivial, negative slopes were detected for c.v. Above 0.4 l/s the relationship of flow to mean R_{int} values varied between subjects and was also significantly flow dependant, though reproducibility slightly improved. If all flow rates are considered together, c.v. range is 12 – 16 %. In conclusion R_{int} should be measured at a specified flow rate, preferably at 0.4 l/s to obtain the best signal-to-noise ratio.

USE OF THE INCREMENTAL SHUTTLE WALKING TESTS (ISWT) IN THE ASSESSMENT OF PATIENTS FOR CARDIAC TRANSPLANTATION

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LUNG INVESTIGATION UNIT AND *DEPT CARDIAC TRANSPLANTATION,
QUEEN ELIZABETH HOSPITAL, BIRMINGHAM

The ISWT has been shown to relate to maximal oxygen consumption (peak VO_2) obtained from a formal exercise test in patients with COPD (Singh et al 1994; Eur Respir J 7:2016-2020). In patients with heart failure, peak VO_2 is used as a marker of disease prognosis and is also utilized in the selection of potential cardiac transplant recipients. Treadmill derived measures of peak VO_2 are, however, difficult to obtain and unpopular with these patients. We therefore investigated whether the ISWT could be used in the assessment of potential cardiac transplant recipients. 22 patients were recruited from the cardiac assessment population over a period of 8 months. Each patient was required to perform two incremental treadmill tests (modified Naughton protocol) and three ISWT, the first of which was a practice test. The results revealed a strong correlation ($r=0.69$: $p=0.0001$) between distance covered in the ISWT and peak VO_2 obtained during the treadmill test. Peak heart rates for both tests (ISWT 134.6 ± 6.1: VO_2 peak 136.4 ± 5.9 bpm) were similar ($r=0.86$: $p<0.0001$), indicating a similar exercise workload. 96% of patients expressed a preference for the ISWT. Linear regression enabled us to form the following equation : $VO_2 = 0.0022 \times dist. + 6.6$, where VO_2 is the peak VO_2 (ml/min/kg) and dist. Is the distance walked (meters) during the ISWT. In conclusion the ISWT appears to be a valid exercise test of functional capacity in patients with chronic heart failure. It is simpler and quicker to perform than a formal Treadmill test and could potentially be used as a screening technique for patients undergoing assessment for transplantation.

RESPIRATORY SYMPTOMS AND LUNG FUNCTION CHANGE IN WELDERS. HOW DO THEY COMPARE TO WORKPLACE EXPOSURES?

D. FISHWICK [1], L.M. BRADSHAW [1], T. SLATER [2], A.D. CURRAN[1], N PEARCE [2]
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The possibility was investigated that work related respiratory symptoms and acute falls in FEV_1 seen in current welders relate to measured work place exposures to total fume and metals. Changes in pulmonary function and reported respiratory symptoms were recorded in 75 welders (and non-welders) in four work sites in New Zealand. Personal breathing zone levels of total fume and various metals were also determined. Work related respiratory symptoms were reported by 21.3% of all workers and related significantly only to personal breathing zone nickel exposure; (odds ratio (OR) and 95% confidence interval (CI) of the high exposure group in relation to a low exposure group)
OR 7.0, CI 1.3-36.6. There were non-significant associations (odds ratio > 2.5) seen with total fume exposure, exposure index of greater than 10 years and age between 25 and 40 years. A fall in FEV_1 of at least 5% after 15 minutes of work was significantly associated with aluminium exposure alone; OR 5.8 CI 1.7-20.6. Current MIG and TIG welding, and particularly respectively nickel and aluminium exposure are associated with work related respiratory symptoms and a fall in FEV_1 of at least 5% after 15 minutes of work.

APPLICATION OF WITHIN-BREATH FORCED OSCILLOMETRY IN BRONCHODILATOR REVERSIBILITY TESTING

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DEPARTMENT OF RESPIRATORY MEDICINE, GLASGOW ROYAL INFIRMARY

There are concerns regarding the sensitivity of FEV_1 as a measurement of bronchodilator reversibility in chronic obstructive pulmonary disease. Forced oscillometry can be used to estimate resistive work of breathing (rWOB) by integrating over time the product $(V')^2$. Rrs, where V' is flow and Rrs is continuous, within-breath respiratory resistance. Here we examine the use of this measurement in assessing bronchodilator reversibility.

We measured FEV_1, specific airways conductance (sGaw), Rrs and $(V')^2$. Rrs pre and post nebulised Salbutamol on 24 patients with airways obstruction (8 males; aged 23-79 years; FEV_1 0.55-2.64 litres; FEV_1/FVC ratio 0.37-0.8l). Eight showed a significant increase in FEV_1 (> 200ml), whereas 15 had a significant increase in sGaw (> 0.1 $kPa^{-1}s^{-1}$ and > 35% change) and 12 had a significant decrease in Rrs (> 11% change) *. The mean rWOB for the group was significantly reduced by 15.7% post bronchodilator (Wilcoxon signed rank test p=0.003; 95% CI 8.2% to 23.2%). Considered individually, 8 of the 24 patients had a significant decrease in rWOB post bronchodilator (>17% change)*.

rWOB derived from forced oscillometry appears to be as sensitive at detecting bronchodilator reversibility as FEV_1 but less so than other measures of resistance such as sGaw and Rrs.

• = 2 x coefficient of variation

ESTIMATING AN INDIVIDUAL'S ABILITY TO WORK AND PLAY

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Few studies have described the work requirement of modern jobs, or related the tasks to other activities of daily living. We have studied 18 healthy female hospital cleaners (mean(SD) age 40(10), FEV_1 100(15)% predicted) with 24hr ambulatory heart monitors matched to 15min diaries indicating activities performed during the day. In 10 subjects, heart rate was also related to VO_2 using steady state exercise tests.

Time	Sleep	AM	Going to work	Work	Going home	PM
Median HR	62(6)	81(11)	91(14)	89(12)	90(13)	77(10)
Peak HR	81(9)	102(16)	107(19)	113(16)	106(19)	106(19)

HR data show that peak requirements of the job are only marginally greater than the effort needed to get to work. When converted to VO_2 for the 10 individuals the peak work requirements equate to 750 mls/min (range 572-984) or 46% of individuals VO_2max (range 33-66%). The mean requirements of specific tasks could also be evaluated: hoovering 28%(sd 13%), mopping 30%(sd 8%), buffing 27%(sd 7%). For 4 who walked home, HR data showed a higher work output than the job. The maximum VO_2 at work, or when walking home (50% (range 33-66%)), is well within the capabilities of healthy workers. Considerable function loss would have to occur before these individuals would become disabled from these manual jobs and the tasks of walking to work may itself become a limiting factor. This technique has promise as a means to reevaluate the requirements of specific jobs and to estimate individuals ability to perform them.

THE ROLE OF INSPIRATORY CAPACITY (IC) MEASUREMENTS TO ASSESS CHANGES IN HYPERINFLATION POST BRONCHODILATION

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Hyperinflation may represent the major cause of symptoms in flow-limited patients, as breathing at an increased lung volume burdens the respiratory system. IC can be used as an indirect measure of hyperinflation, thus if hyperinflation is reduced post bronchodilator therapy a change in IC should be evident. Aim of study is to determine whether changes in IC correlate with changes in hyperinflation as measured by thoracic gas volume (VTG). Positive bronchodilator response, as measured by simple spirometric measurements, should also be apparent using IC measurements. Patient group consisted of 17 patients with evidence of hyperinflation (9 male, mean age 53, range 25-76). Forced expiratory volume in one second (FEV_1) was obtained using a Wedge Bellows spirometer (Vitalograph, Bucks) and IC and VTG using a Body Plethysmograph (Morgan Medical, Kent). Salbutamol/Terbutaline was delivered via a metered dose inhaler with a volume spacing device.

Parameter measured pre and post bronchodilator	Statistical significance	Mean percent change (%)
FEV_1	P = 0.000	18
IC	P = 0.012	13
VTG	P = 0.001	-7

Analysis revealed a correlation between IC and VTG (r= -0.436) consistent with IC being an indirect measure of hyperinflation. Change in both IC and FEV_1 post bronchodilator were both significant indicating IC could be a useful addition to routine reversibility assessments. A response in terms of hyperinflation may result in a reduction in symptoms in flow-limited patients.

POSTURAL CHANGES AND ITS INFLUENCE UPON THE CARBON MONOXIDE TRANSFER FACTOR OF THE LUNGS

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The ventilation perfusion relationships within the lung determine the ability to transfer gas. Changes to this relationship due to the influence of posture could therefore alter the measured transfer factor. Previous studies have shown that changing from seated to supine increases the transfer factor (TL) of the lungs. Aim of study was to further investigate whether the documented increase in TL (Shi-Chuan Chang M.D. *et al*. Chest 1992:102.1:139-142) is true within a group of normal individuals with the view to extending the findings into disease states. The transfer factor for carbon monoxide (TL_{CO}) was measured in 9 normal subjects (7 female, mean age 27, range 20-33) whilst seated and supine. Two results within 5% were obtained for each position. Other parameters obtained were transfer coefficient (K_{CO}), effective alveolar volume (Eff VA) and volume inspired (VI). All parameters were measured using a Benchmark (Morgan Medical,Kent).

Change in parameter (seated and supine)	Significance
TL_{CO}	P = 0.139
K_{CO}	P = 0.015
VI	P = 0.008
VA	P = 0.008

Analysis of the results showed that TL_{CO} did not significantly change when supine, however there was a significant increase in K_{CO}. Further analysis showed a correlation between K_{CO} and VI (r= -0.765), suggesting that the change in K_{CO} can be explained by a decrease in VI and therefore EffVA (r= 0.947) when supine. These results contradict previous findings, however these studies included the measurement of D_m and V_c. It is intended to extend this study to include these parameters.

THE COMPARISON OF A PATIENT QUESTIONNAIRE TO OUTCOME IN THE DETECTION OF OBSTRUCTIVE SLEEP APNOEA SYNDROME

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This unit provides a limited sleep studies service for respiratory and ENT referrals. Patients undergo an overnight home oximetry and complete a questionnaire (1) about their sleep pattern and symptoms. The questionnaire creates a predictor score and records body mass index (BMI), neck circumference and symptoms. The oximetry trace is the prime indicator for progress to a trial of Continuous Positive Airway Pressure (CPAP).

The aim of this study is to assess the value of the questionnaire in predicting outcome. Patients (n=700) were included if they had oximetry, questionnaire and an outcome. Patients with multiple episodes where saturation of oxygen (SaO_2) falls by at least 4% for many short periods during the night progress onto a home trial of CPAP. Other outcomes are "no further action" or "other".

	CPAP trial 205 (29%)	No action 297 (43%)
Males	87%	71%
Mean Age	52	48
Mean BMI	34 Kg/m^2	29 Kg/m^2
Mean Neck Size	46 cm	41 cm
Snorers	92%	85%
Nocturia	84%	63%
Witnessed Apnoea	62%	39%
Past/Current Smokers	30%	21%

Nocturia and witnessed apnoeas are more prevalent in severe OSA and should be taken into account in equivocal cases.

Ref Bolitschek J, Aigner K, Schindl R. Eur Respir J 1990 (Supp.11) : 532s

AN INVESTIGATION OF THE CORRELATION BETWEEN ALVEOLAR VOLUME (V_A) AND TOTAL LUNG CAPACITY (TLC).

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Background

The aim of this study was to investigate whether the relationship between V_A and TLC is a useful index in normal, obstructive and restrictive subjects.

Subjects

30 subjects were recruited from non-smoking or ex-smoking (pack years < 10) members of staff and patients.

Table 1

SUBJECT	SEX	MEAN AGE	FEV% (SR)	RV/TLC% (SR)	T_LCO (SR)
10 Normals	5 M, 5 F	48 (24-65)	-0.25	-0.38	0.12
10 Obstructive	9 M, 1 F	62 (49-74)	-4.88	3.45	-2.55
10 Restrictive	4 M, 6 F	48 (28-65)	0.13	-0.93	-3.66

Methods

Subjects performed multiple breath helium dilution technique to determine Function Residual Capacity (FRC) and subsequent calculation of TLC followed by single breath carbon monoxide gas transfer test (Benchmark, Morgan Medical). All tests were performed in accordance with national guidelines (Ref-Respiratory Medicine (1994) 88, 165-194). Statistical analysis was by ANOVA and paired students t-test.

Results

For all subjects: TLC mean = 5.55 ± 1.95 V_A mean = 4.54 ± 1.72

Table 2 shows the mean values for TLC and V_A in the 3 groups.

Table 2

SUBJECT	TLC			VA			TLC – VA		
	MEAN		SR	MEAN		SD	MEAN		SD
Normal	5.93	±	1.37	5.43	±	1.21	0.50	±	0.39
Obstructive	7.30	±	1.09	5.04	±	1.55	2.16*	±	0.81
Restrictive	3.43	±	1.02	3.15	±	1.38	0.28	±	0.84
All	5.55	±	1.95	4.54	±	1.72	1.02	±	1.13

*$p < 0.05$

Conclusion

The V_A was found to be approximately 80% of the TLC with the closest correlation found in normal subjects. The difference between TLC / V_A appears to be a useful marker of airways obstruction in small airways disease.

CHANGES IN HEALTH STATUS DURING A TWO WEEK TRIAL OF CPAP TREATMENT

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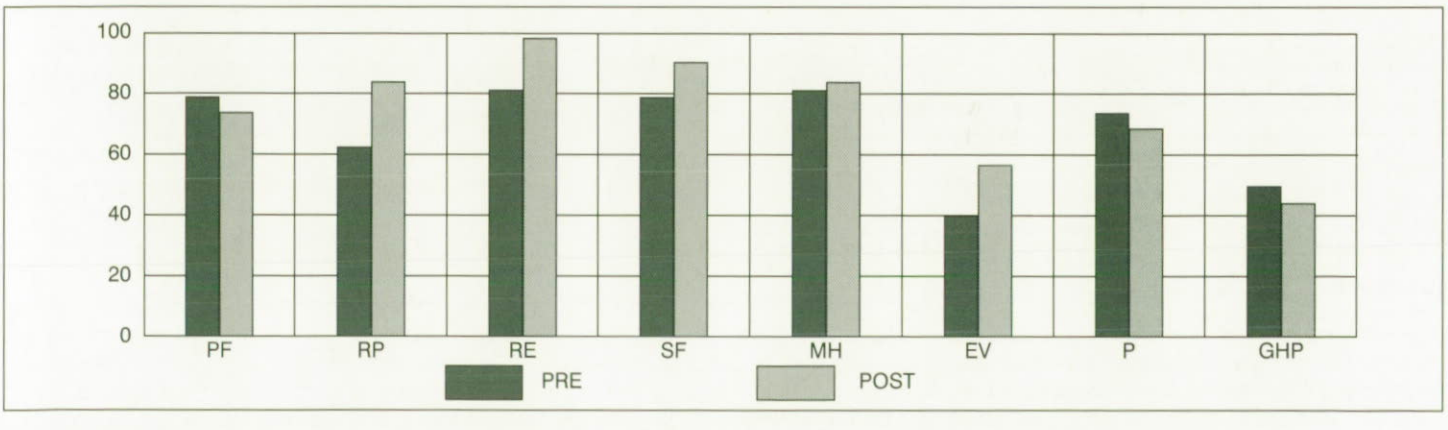
This unit performs home trials of equipment providing continuous positive airway pressure (CPAP) to treat Obstructive Sleep Apnoea. These trials are of two weeks duration, with pulse oximetry at start and finish, and a questionnaire to elicit patient comments in a systematic way. Compliance with therapy is assessed by measurement of hours the machine is switched on per night. In 15 consecutive patients we had added in the UK version of the Short Form (36 questions) Questionnaire on Health Status (SF36) at beginning and end of the trial particularly to assess change in energy / vitality as reported by Jenkinson. (1)

There were 13 males in the group. Mean age was 53 years. Only compliant subjects (those using the machine for more than 2 hours per night of the trial) were analysed.

The dimensions of the SF36 are Physical function (PF), Role limitation due to physical problems (RP), Role limitation due to emotional problems (RE), Social Functioning (SF), Mental Health (MH), Energy / Vitality (EV), Pain (P) and General Health Perception (GHP). A higher score indicates better health status.



It can be seen that role limitation and energy / vitality are positively affected by the 2 week trial of CPAP.

Ref Jenkinson Cet al J. Sleep Res (1996)6, 199-204

CONTROLLED ENVIRONMENT EXPOSURE TO AMMONIA IN NORMAL VOLUNTEERS – A PILOT STUDY

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Workplace exposure to ammonia (NH3) in the United Kingdom is currently controlled by an occupational exposure standard of 25ppm TWA over an 8-hour shift and a short term exposure limit, STEL, of 35ppm over 15 minutes. We investigated the pulmonary response to ammonia in varying concentrations above the STEL in a controlled environment suite. All individuals were normal non-asthmatic volunteers. Four were exposed on separate occasions to 50ppm and 75ppm for 5 minutes and a further 3 were exposed to 110ppm for 60 seconds. The table details the change in lung function parameters measured in all volunteers prior to and immediately following exposure to ammonia.

Dose	Mean % change in FEV_1	Mean % change in FVC	Mean % change in PEF	Mean % change in MEF
50ppm (5 mins)	+0.27	-1.76	-1.99	+3.76
75ppm (5 mins)	+1.63	+2.05	-12.62	+2.14
110ppm (1 min)	-1.35	-1.11	-9.0	-0.50

This pilot study suggests that exposure to ammonia above 75ppm causes significant fall in PEF, which is not accompanied by significant changes in other pulmonary function parameters or significant respiratory symptoms.

THE ROLE OF IMPULSE OSCILLOMETRY IN THE ASSESSMENT OF REVERSIBILITY IN PATIENTS WITH EMPHYSEMA DUE TO ALPHA-1-ANTITRYPSIN DEFICIENCY.

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Impulse oscillometry (IOS) is a simple, non-invasive method of measuring airways resistance providing information on central airways resistance (R5) and of peripheral airways resistance (X5) at 5Hz. Aim of study is to determine whether changes in IOS parameters (R5 and X5) measured pre and post bronchodilator, correlate with standard measurements of FEV_1. The patient group consisted of 27 patients with emphysema due to alpha-1-antitrypsin deficiency (13 male, mean age 51, range 28-75 years). FEV_1 was obtained using Wedge Bellows spirometer (Vitalograph, Bucks) and IOS parameters using a Masterscreen (Erich Jaegar). 5mg of Salbutamol / Terbutaline was delivered via nebulisation.

Statistical analysis was performed using Wilcoxon paired t-test and correlation coefficient.

	Mean % change pre and post	Significance
FEV_1	18	P<0.000
R5	-22	P<0.000
X5	33.7	P<0.000

Analysis of results showed a correlation (r = 0.577) between FEV_1 and X5, this finding is consistent with the pathology of emphysema as X5 represents the elastic properties of the lungs. Analysis did not show a correlation between FEV_1 and R5 (r = 0.278). No correlation was observed between percent change, pre and post bronchodilator, in FEV_1 and any IOS parameters. Therefore negative bronchodilator response on simple spirometric testing does not preclude a positive response measured via impulse oscillometry. Currently there are no guidelines to indicate a statistically significant response in IOS parameters to indicate positive reversibility to a bronchodilator.

ARTERIALISED EARLOBE BLOOD GASES: USED FOR LONG TERM OXYGEN THERAPY (LTOT) PRESCRIPTION

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Arterialised earlobe samples are being increasingly used for the measurement of blood gases. We set out to validate the technique in our own laboratory prior to clinical use. 19 pairs of arterial and arterialised capillary samples were taken from a random group of patients attending the pulmonary function laboratory. Mean differences and 95% confidence limits were calculated for pH, PO_2 and PCO_2 and compared with the published data.

Table

	n	95% confidence limits		
		pH	PO_2(kPa)	PCO_2(kPa)
Pitkin et al [1]	40	-0.01 → 0.02	-1.09 → 0.75	-0.24 → 0.67
Dar et al [2]	55	-0.02 → 0.06	-1.09 → 1.27	-0.59 → 0.61
Langlands [3]	16	-0.02 → 0.03	-1.00 → 1.16	-0.28 → 0.56
Spiro et al [4]	11	-0.03 → 0.06	-0.32 → 0.13	-0.11 → 0.39
Ashley et al	19	-0.03 → 0.02	-0.28 → 1.22	-0.33 → 0.87

We were concerned that the confidence intervals others and we had obtained were wide, particularly for PO_2. Although arterialised capillary blood gas measurements have many benefits, principally the relative ease of the technique, and may be appropriate for monitoring changes in parameters over time such as the PCO_2 and/ or pH to assess adequacy of ventilation in patients receiving assisted ventilation in the ward setting, their use in the assessment of patients for LTOT prescription may result in inappropriate prescription, or withholding of this treatment, due to the inaccuracy of the technique. We suggest that arterialised capillary blood gas measurements are an inadequate surrogate for arterial blood gases for assessment of patients for LTOT prescription.

LABORATORY ASSESSMENT OF FITNESS TO FLY IN PATIENTS WITH LUNG DISEASE: A PRACTICAL APPROACH

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INTRODUCTION

As commercial aviation increases, more patients with lung disease are considering air travel. At cruising altitudes (9150-12200 metres) most commercial aircraft maintain a cabin pressure equivalent to an altitude of 2438 metres (8000 feet) above sea level. At this pressure the PO_2 is approximately 14.4 kPa which is equivalent to an FiO_2 of 15.1% at sea level. Although most passengers can tolerate this reduction in PO_2, passengers with chronic respiratory disease may develop symptoms. To identify those at risk several studies have attempted hypoxic challenge of patients at ground level [1,2,3].

AIMS

We report our experience of a hypoxia inhalation test in patients with chronic respiratory conditions who were contemplating air travel and had asked their physicians opinion of their fitness to fly.

METHODS

Over an 18 month period, 28 patients were referred to the laboratory for assessment of their fitness to fly. Patient data (including the result of the assessment) are presented in Table 1.

1. Hypoxia inhalation test.

Flight fitness was assessed using a modification of the method described by Vohra & Klocke [4] using a full face 35% Venturi mask supplied with 100% nitrogen at 8 litres/minute. Preliminary studies in 10 healthy volunteers had shown that this method provided an FiO_2 at the mouth of 15.1 ± 0.2%, but it now appears that we had a batch of "rogue" 35% masks and that a 40% mask driven at a flow rate of 10 litres/minute (as suggested by Vohra & Klocke) should be used when following this protocol. Nasal canulae were fitted under the Venturi mask to deliver supplemental O_2 when required by the challenge protocol.

2. Protocol.

The challenge protocol and interpretative algorithm are summarised in Figure 2. Both the protocol and algorithm were derived using clinical experience with the aim of achieving a reliable prediction of in-flight hypoxia whilst minimising the need for arterial blood gas sampling.

3. Validation of the protocol.

In an attempt to validate the protocol, a questionnaire was sent to all patients who had undergone assessment for completion upon return from their travel. The questionnaire asked :-

- Was there any change in their clinical condition between the date of the assessment and the date of travel.
- The duration of the flight.
- Whether they had experienced any respiratory distress during their flight (either whilst seated or when moving around the plane).
- Did they require attention from cabin staff during the flight because of their breathing.
- Did they receive oxygen during the flight.

Where patients had been assessed as unfit to fly their intentions regarding future air travel were obtained.

RESULTS (see Table 1)

Patients tolerated the assessment well with no exacerbation of symptoms. Of the 28 patients assessed:-

- 22 (78%) were judged to be fit to fly (group A).
- 2 (7%) were assessed as fit to fly with supplemental O_2 (group B).
- 4 (14%) were considered to be unfit to fly (group C).

The response to hypoxic challenge could not be predicted from FEV_1. Patient 3, who had the lowest FEV_1 did not desaturate, whilst Patient 18 had an FEV_1 of 1.85L but did desaturate. We also found that pairs of patients with the same diagnosis and matching FEV_1 performed differently (see Patients 10 and 11 in Table 1).

Questionnaire response.

Twenty-four patients returned the questionnaire. There was a mean period of 33 ± 41 days between the date of the assessment and the date of the first flight (range 6 - 122 days). Mean flight time was 6 hours 10 minutes (range 3 - 16 hours).The results of the questionnaire are summarised in Table 2.

CONCLUSIONS

- The majority of patients tested in this study were judged fit to travel safely without supplemental oxygen.
- Others become significantly hypoxic during challenge but this could be relieved with supplemental oxygen.
- It is not possible to predict a hypoxic response from clinical diagnosis, measurements of spirometry or pre-test saturation at ground level.
- Questionnaire validation showed that a) not all patients followed our advice and b) not all in-flight symptoms are due to hypoxia.

Our algorithm for interpretation remains empirical. Rigorous validation is very difficult to achieve in practice.

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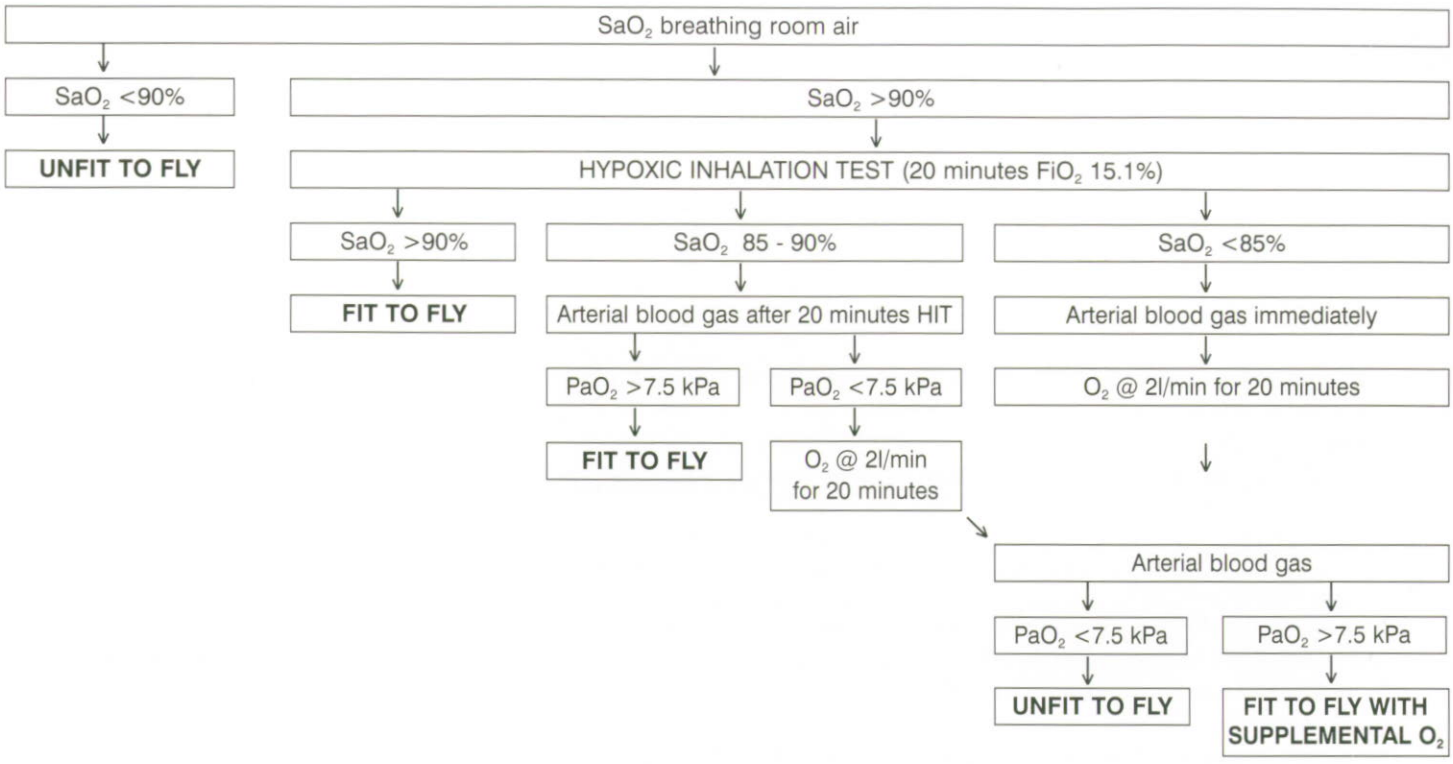

FIGURE 1. Protocol and interpretation algorithm

Patient number	Age	Sex	Diagnosis	Smoking status	FEV_1	VC	FEV_1/VC ratio	FEV_1 (% predicted)	VC (% predicted)	Assessment group
1	89	F	Bronchiectasis	Non-smoker	0.70	1.60	44	56	80	A
2	33	F	Bronchiolitis	Non-smoker	0.95	2.30	41	34	65	A
3	54	M	COPD	Ex-smoker	0.50	3.75	13	13	80	A
4	52	M	COPD	Ex-smoker	0.70	2.95	24	18	60	A
5	70	M	COPD	Ex-smoker	0.50	1.25	40	22	45	C
6	64	F	COPD	Ex-smoker	0.50	1.35	37	26	51	A
7	65	M	COPD	Ex-smoker	0.90	2.35	38	27	55	B
8	69	M	COPD	Smoker	0.90	2.40	38	28	59	A
9	69	M	COPD	Smoker	1.00	3.70	27	29	84	A
10	57	F	COPD	Smoker	0.65	1.70	38	31	61	C
11	64	F	COPD	Smoker	0.60	2.15	28	31	82	A
12	70	M	COPD	Smoker	0.95	2.65	36	31	67	A
13	70	M	COPD	Ex-smoker	1.10	2.00	55	36	51	A
14	72	M	COPD	Ex-smoker	1.25	3.40	37	40	84	A
15	68	F	COPD	Smoker	0.85	1.35	63	40	46	C
16	65	F	COPD	Smoker	0.90	2.20	41	42	75	A
17	75	F	COPD	Ex-smoker	0.70	1.85	38	45	82	C
18	73	M	COPD	Ex-smoker	1.85	4.10	45	58	98	B
19	77	F	COPD	Ex-smoker	1.00	1.85	54	60	76	A
20	71	F	COPD	Ex-smoker	1.20	2.45	49	63	91	A
21	56	F	COPD	Ex-smoker	1.45	2.70	54	65	92	A
22	82	M	COPD	Ex-smoker	1.70	3.45	49	67	104	A
23	68	M	Mesothelioma	Ex-smoker	1.50	1.80	83	45	42	A
24	53	F	Pulmonary fibrosis	Non-smoker	1.50	2.20	68	66	74	A
25	57	F	Pulmonary fibrosis	Ex-smoker	1.40	1.65	85	69	61	A
26	73	M	Pulmonary fibrosis	Non-smoker	2.05	2.55	80	73	71	A
27	76	F	Pulmonary fibrosis	Non-smoker	1.50	1.70	88	117	91	A
28	43	F	SLE	Ex-smoker	1.05	1.35	78	40	44	A

TABLE 1. Patient data, including the result of the assessment.
A = Fit to fly; B = Fit to fly with supplemental O_2; C = Unfit to fly

GROUP A (n = 22) Fit to fly	GROUP B (n = 2) Fit to fly with supplemental O_2	GROUP C (n = 4) Unfit to fly
14 patients flew with no problems reported. 1 patient had a panic attack, treated with supplemental O_2 for 5 minutes. 4 patients have not yet flown. 3 patients abandoned travel plans.	1 patient flew without supplemental O_2 with no problems reported. 1 patient abandoned travel plans.	All 4 patients abandoned travel plans.

TABLE 2. Questionnaire results.

Transfer Factor Assignment – ARTP National Assessment 2000

By the time the candidates read this issue of Inspire, they will probably have completed their practical assessments. The transfer factor assessment was chosen by 13 candidates. Part 1 asked for an outline of a quality assurance program and highlighted some interesting problems (see below). The mean score was 63.3% (range 45% to 90%) with the candidates doing reasonably well.

Part 2 asked the candidates to measure and present the results, including calculations and traces in 4 patients with asthma, COPD, a restrictive defect and a combined defect. The mean score was 46.3% (range 27% to 77%) with some candidates clearly doing very badly.

Marking these assignments demonstrated that some candidates –

- Do not read the question properly and hence do not provide the information requested. If asked for traces or to show the TLCO calculations, this is what the examiner is expecting to see.
- Provided different answers to those given by their computer print-outs. Whose calculations are correct and importantly do the candidates know what calculations their computerized systems are actually using? It is essential that the candidate has knowledge of the calculations used by the computer, and although not necessarily expected to remember them, should be able to locate them easily within the department.
- Do not understand basic statistics, and in particular plotting lines through data points. Remember, when you plot data it does not have to go through the origin, even if you used on zero point for your helium and CO analysers. Some candidates did not use the zero points, although they clearly had the data from setting up the analysers. Other candidates plotted the data using best fit - by eye. Plotting the data by simple regression techniques provides some very different answers to those given by the candidates.
- Were confused by normal ranges and by standardized residuals. These are covered in the ARTP handbook very clearly. Some departments appear to have a very unusual definition of normal ranges!
- Appeared to know little if anything about how the pathophysiological changes occurring in disease actually affected lung function, and in particular TLCO and KCO. Furthermore, providing additional relevant static and dynamic lung volume data helps to clarify the state of the patient and provides better interpretation. Some candidates will have hopefully brushed up on this before the examiners arrived.

Of concern, for quality assurance is that some equipment could not be manually calibrated. For instance, some devices had no apparent way of assessing the linearity of the gas analysers. Linearity could not be assessed by simply diluting the test gas mixture in a sample bag and looking at the decrease in both CO and He. If the analysers are linear, then both gases should decrease by the same degree and hence the relationship is linear. Some systems use flow sensors that require the gas mixture to pass through the flow sensor before the equipment will work, whilst others appear to make it so difficult to find the gas analyser connectors that the linearity check is abandoned. The lack of help from some manufacturers to resolve this problem does little to improve the image of those manufacturers concerned.

Not being able to perform the simple linearity check is one problem, not being able to perform any linearity check is unacceptable. It appears that some systems check everything themselves, do a two-point calibration only and assume the analysers are linear. This may not be correct. One might ask the manufacturer how they assess analyser linearity when the annual maintenance check occurs. If the manufacturer can carry out a linearity check, then so should the technicians who own the equipment.

Clearly knowing how well your equipment works and how reliable it is is important. Being able to get raw data from the device and being able to print out the traces from the computer screens is an essential part of the overall quality control process. It appears that the only way to get this information, with the minimal amount of hassle and to be able to do proper manual calibrations is to use equipment now deemed by the manufacturers as old technology. The black box syndrome breeds lax attitudes in some, dependence on technology in others and reduces the understanding of what is actually going on. This is unacceptable, but unfortunately, for some candidates in this year's assessment the evidence suggests that this is already reality.

Good luck to everyone.

Comments by Dr. Adrian Kendrick, Clinical Scientist Bristol Royal Infirmary.

REVIEW OF ARTICLES

SLEEP

Two months auto-adjusting versus conventional nCPAP for obstructive sleep apnoea syndrome. Teschler H et al. Eur Respir J 2000; 15: 990-995.

There is already evidence that autoadjusting CPAP is more effective at reducing the AHI and reduces the median pressure (P50) compared with manually titrated conventional nCPAP. The aim of this study was to determine if the benefits were maintained over the medium term. This was a double-blind, randomised, crossover study in ten patients. Patients received 2 months each of autoadjusting CPAP and set-pressure CPAP. There were no differences between the AHI or hours of compliance with either machine. There was a significant reduction in median pressure with the autoadjusting CPAP (23%) and leak did not affect the autoadjustment.

External nasal dilation reduces snoring in chronic rhinitis patients: a randomised controlled trial. Pavernagie D. et al. Eur Respir J 2000; 15: 996-1000.

This study examined those nasal strips that all the rugby players seem to wear, to see if they would improve Englands chances in the five nations championship and also if they were any good at stopping snoring in people with chronic stuffy nose (rhinitis). The research group used scientific methods (polysomnography) to examine this important phenomenon. 12 patients were studied and randomised to receive a placebo nasal strip (a piece of sticky tape) or the real thing. The active treatment significantly lowered snoring frequency (173 snores per hour) compared with the placebo (258 snores per hour) though it had no effect on sleep quality, AHI, or snoring loudness. Thus, at last you have evidence at your fingertips for the next time a patient asks whether the nasal strips are useful for improving the try rate at the next home international you will be able to give some sound advice.

COPD/Rehabilitation

Effects of two types of training on pulmonary and cardiac responses to moderate exercise in patients with COPD. Puente-Maestu L et al. Eur Respir J 2000; 15:1026-1032.

This study compared the physiological effects of supervised exercise training on a treadmill to non-supervised free walking in 35 patients with moderate/severe COPD. The outcome measures were endurance time, gas exchange, ventilatory and heart rate kinetics. Both types of training significantly improved the outcome measures compared to baseline levels, however the supervised training produced a bigger effect than the un-supervised training. The authors conclude that training speeds the kinetic response of oxygen consumption, CO2 production, ventilation and heart rate, and that supervised, intense training produces a greater effect.

Safety of sputum induction in chronic obstructive pulmonary disease. Rytila PH. et al. Eur Respir J 2000; 15: 1116-1119.

Sputum induction is increasingly used for clinical diagnostic, intervention and research purposes. The aim of this study was to evaluate the safety and success of sputum induction in patients with varying severity of COPD. 28 patients were recruited and sputum induced with increasing concentrations of hypertonic saline following premedication with 200 micrograms of salbutamol. The procedure was well tolerated with no reports of side effects. However falls in FEV_1 were recorded (-8.5% from baseline prebronchodilator FEV_1 and –10.7% fall from the post bronchodilator FEV_1). The ranges were wide and 3 patients had a fall of 20%. Thus the authors concluded that sputum induction, using hypertonic saline, can cause meaningful bronchoconstriction despite pretreatment with salbutamol. The authors stress the importance of monitoring spirometry during the procedure.

LUNG FUNCTION

Paradoxical vocal cord motion causing stridor after thyroidectomey. Harbison J et al. Thorax 2000; 55: 533-534.

This case report describes two women referred with stridor following thyroidectomy. The report gives excellent reproductions of the flow volume loops (good teaching material!). The authors suggest, that although paradoxical vocal cord motion is believed to have psychological origins, in these cases it was likely that subtle interference with the laryngeal innervation during surgery was likely to be the cause.

Oral and bronchial provocation tests with aspirin for diagnosis of aspirin – induced asthma. Nizankowska E et al. Eur Respir 2000; 15: 863-869.

These admirable workers, with nerves of steel, gave 35 aspirin sensitive asthmatics increasing doses of oral aspirin (cumulative dose 500 mg) and compared the change in FEV_1 with that recorded following increasing doses of bronchial aspirin (cumulative dose 182 mg). A positive response was considered if there was a fall in FEV_1 >20% and/or strong extrabronchial symptoms of intolerance occurred. The authors found that both provocation tests had similar specificity whilst the oral test showed a higher sensitivity for a diagnosis of intolerance.