Inspire

The Official Journal of The Association for Respiratory Technology and Physiology

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FIRST WORD

Well it appears that Blackpool went off with a bang with another successful ARTP Winter Meeting. This edition of *Inspire* contains the meeting reports, and the abstracts that were displayed and presented. Please don't forget to return your evaluation forms to the ARTP Administrator as preparations for ARTP 2002 are already well underway and your comments are invaluable to ensure that the content, venue, exhibition and festivities are up to your expectations. The evaluation forms are your way of improving meetings of the future – if you've lost your form then send comments by post or e-mail or voice your thoughts on the ARTP website: forum@artp.org.uk.

All ARTP members should now have received their documents for application to the Voluntary Registration Council. If you have any colleagues who are not ARTP members they should apply for a registration form from RCCP Administrator – details within.

Since the last edition of *Inspire*, the ARTP has been approached by EPTA (The Electrophysiological Technologists Association) to establish additional communication links between our professional groups with the sharing of journals and hopefully this will develop further with other groups. Many clinical and non-clinical issues, training courses and scientific papers published in journals from other Clinical Physiology disciplines may be of interest or significance to the other groups within CP. A review of *Inspire* has been written for the EPTA journal, *JET*, by its editor Judith Al-Seffar, comparing the two journals and highlighting topics not at present covered in their journal. It is planned to mirror this with a 'Journal Review' in *Inspire* and share with our members some of the common issues raised by colleagues in other areas of Clinical Physiology.

Since the last edition of *Inspire* the journal has now been registered with the British Library with an **ISSN** number **ISSN 1473-3781** and plans are also in process to change its appearance with a new front cover design. The regular features will remain but if anybody has any suggestions (or volunteers!!) for new features I would love to hear from them.

Please keep sending in contributions to *Inspire* to me:

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Belvedere Road
Burton on Trent DE13 0RB or via e-mail: inspire@artp.org.uk

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NEWS FROM THE SCOTTISH FORUM

The spring meeting of the ARTP Scottish Forum has unfortunately been cancelled due to lack of sponsorship.

As reported in the AGM minutes there has been increasing interest in the activities of the Scottish Forum with the numbers of members attending increasing with each meeting. The Scottish Forum has also recently been approached by technicians from Ireland wishing to join up with them for meetings. For more details of this and the Scottish Forum's "Bus trip to Blackpool" watch this space in the next edition of *Inspire*.

More details about the activities of the Scottish Forum can be obtained from Jill Fallen or Andy Robson Tel: 0131537 2575 or e-mail: scottish@artp.org.uk.

ASSOCIATION NEWS

ARTP HANDBOOKS

SPIROMETRY HANDBOOK: £25 MEMBERS £35 NON-MEMBERS
RESPIRATORY FUNCTION: £40 MEMBERS £55 NON-MEMBERS
TESTING HANDBOOK

Both are available from Jackie Hutchinson ARTP Administrator,
202 Maney Hill Road, Sutton Coldfield B72 1JX Tel: 0121 2411611

ARTP SWEATSHIRTS AND POLO SHIRTS

As seen at Blackpool the ARTP now have for sale sweatshirts carrying the ARTP logo.
Please contact Jackie Hutchinson ARTP Administrator.

SWEATSHIRTS (NAVY BLUE) £15.00 PLUS P & P.
POLO SHIRTS (WHITE OR NAVY BLUE) £12.00 PLUS P & P.
ALL SIZES AVAILABLE IN SIZES S/M/L/XL.

ADVERTISING RATES

QUARTERLY IN JOURNAL

INSPIRE 1/4 Page £200 1/2 Page £300 Full Page £400

FLYERS Supplied by advertiser £150
(< 200 g) Photocopied by ARTP £300

FLYERS Professional Groups / Charities - Rate negotiable

MAILSHOTS

MONTHLY £600 (last Friday in the month) URGENT £750 (within 5 days)
Flyers and mailshots will also be distributed via the ARTP e-mail forum

CLINICAL PHYSIOLOGY VOLUNTARY REGISTRATION FORMS

THE CLINICAL PHYSIOLOGY VOLUNTARY REGISTRATION FORMS ARE NOW AVAILABLE.
ALL ARTP MEMBERS SHOULD HAVE RECEIVED THESE.
IF YOU HAVE NOT RECEIVED YOURS OR IF YOU HAVE ANY COLLEAGUES WHO ARE NOT ARTP MEMBERS THAT REQUIRE A FORM PLEASE APPLY TO:

Jackie Hutchinson, RCCP Administrator, 202 Maney Hill Road, Sutton Coldfield, West Midlands, B72 1JX
Tel/Fax: 0121 241 9699

PLEASE ENCLOSE A S.A.E.

URGENT NOTICE TO ALL PROFESSIONAL ASSOCIATIONS

Due to a printing omission on the application form for voluntary registration there is no designated space for applicants to provide their maiden name or any other name changes.

We would be grateful if applicants could provide all previous/maiden names when completing their forms and copies of marriage certificates if appropriate. Previous names should be placed in brackets next to the current surname to help with authenticating certificates and other accompanying documentation.

If individuals have already submitted forms the RCCP Administrator will contact them directly if this information is required.

Thank you for your help in this matter.

Dr. Sue Hill - Chair RCCP.

DATES FOR YOUR DIARY

ARTP/BTS SHORT COURSE IN BASIC RESPIRATORY FUNCTION MEASUREMENT

This course covers basic anatomy and physiology, measurement techniques and principles, equipment and infection control etc. It compliments the ARTP/BTS National Assessment and is strongly recommended for those intending to undertake the assessment. The course is also suitable for technicians wishing to gain a more in-depth knowledge of basic respiratory function and measurement principles. The course runs over a period of 4 days and applicants may register for the whole course or on a daily basis.

This year the course will be held at two centres:

LUNG INVESTIGATION UNIT, QUEEN ELIZABETH HOSPITAL, BIRMINGHAM 8th to 11th May 2001

SCOTTISH HEALTH SERVICE CENTRE, EDINBURGH 29th May to 1st June 2001

Cost: ARTP MEMBERS £150 for the full course £45 / day
NON MEMBERS £175 for the full course £60 / day

Full details and application forms from Jackie Hutchinson, ARTP Administrator, 202 Maney Hill Road, Sutton Coldfield B72 1JX
Tel : 0121 241 1611

BRITISH SLEEP SOCIETY - ANNUAL SCIENTIFIC MEETING 19th – 21st September 2001 ROBINSON COLLEGE, CAMBRIDGE

Submissions of abstracts for poster or short oral communications are invited. Particularly the BSS would like to encourage presentations for a session dedicated to 'Treatment for Respiratory Sleep Disturbances'. Travel bursaries are available for Technologists and Scientists submitting abstracts.

For details contact: **BSSoffice@huntingdon52.freeserve.co.uk**

RESPIRATORY EDUCATION RESOURCE CENTRES (RERC)
Breathing Life into the 21st Century 14th – 15th June 2001 London

Programme includes: COPD - Screening to Palliative Care, Respiratory Paediatrics, Asthma, Lung Cancer, Special Interest Respiratory Disorders in Adults and Paediatrics and The Dynamics of Chronic Disease on the patient and carer

Cost £160 for one day or £280 for both days. Full details and registration forms are available from Dave Lynes, R.E.R.C., Tel: 0151 343 1313

VENTILATION THROUGH THE AGES
International Scientific Symposium
SEPTEMBER 10th – 12th 2001 HULL ROYAL INFIRMARY

Topics include: Conventional and non-conventional ventilation, non-invasive ventilation, alternative gases, hyperbaric ventilation, field ventilation, graphics, monitoring, cardiorespiratory interactions, weaning, HIV, enterovirus, bronchoscopy, the difficult airway, bronchopulmonary dysplasia, pulmonary hypertension, surfactant therapy and intensive care in developing countries and war zones.

For registration contact: Sue Hubbard, ERMEC, Hull Royal Infirmary, Anlaby Road, Hull HU3 2JZ
Tel: 01482 674007 Fax: 01482 586587 e-mail: suehermec@hotmail.com

NATIONAL ISSUES

NEW OPPORTUNITIES FOR NHS HEALTHCARE SCIENTISTS

A comprehensive strategy for modernising education and training and improving the career opportunities and status, of the 40,000 healthcare scientists working in the NHS in England was announced on Wednesday 28 February 2001 by Health Minister, Lord Philip Hunt.

One of the six key aspects of the Strategy is "a major project to develop a National Occupational Standards Framework to enhance public confidence". The Science, Technology and Mathematics Council (ST+MC) has been chosen as the National Training Organisation, (NTO) to work with the Health Service on this project, which will also include healthcare scientists employed in Northern Ireland, Scotland and Wales.

The National Occupational Standards (NOS) development phase of the project will be completed in three years by NHS healthcare scientists working with Fletcher Consultancy Limited. At the same time, other NHS working groups will determine the optimum means of implementing the NOS in the workplace, of assessing practitioner performance against them and of ensuring that education and training provision effectively underpins the knowledge and skills required by the standards. The overall time scale for the NOS project, including full implementation in the NHS, is four years.

All phases of the NOS project will be overseen by a Steering Committee chaired by Dr Sue Hill of the Queen Elizabeth Hospital, Birmingham. The Steering Group comprises representatives of the Professional Bodies, Trade Unions, Department of Health, other Government health departments for Scotland, Wales and Northern Ireland, Healthcare scientists, Accreditation Bodies and the ST+M Council.

The NOS Project is being funded by the NHS in England and Wales and by the Qualification Accreditation Bodies in all four countries of the UK. The project manager is Bill McNichol, former Chief Executive of ST+MC.

Further information about the Project is available on **www.noshcs.co.uk** and about the Healthcare Science Education and Training Strategy on **www.gov.uk/makingthechange**

BURSARY ARTICLE

A report on the ARTP/BTS short course Interpretation of Lung Function Tests

Catherine Gilliland MTO3 Altnagelvin Hospital Northern Ireland

I applied to the ARTP for a bursary to help me attend the ARTP/BTS short course held in the Postgraduate Centre, Queen Elizabeth Hospital, Birmingham, England. The course ran from Monday 24th to Tuesday 25th July 2000.

Registration was at 9.30am, which allowed me time to leave my luggage at the hotel before making a dash to the Postgraduate Centre. On applying for the course a list of hotels had been supplied. It was rather amusing as the first hotel on the list that I tried informed me that I was too young for accommodation. This was really nice, as it is not often at my stage in life that I am called too young! As it turned out the hotel was now a residential home for the elderly. But ... they did say that I should feel free to contact them if I needed a room in the future!

After the welcome by Dr Sue Hill, Dr Martin Miller covered dynamic lung volumes, flow measurements and reference values. We then broke for coffee, which gave me a chance to meet the others on the course. It was great to see so many attending, with quite a mixture of staff grades (from nurses, technicians and doctors) and from various parts of England, Scotland, Wales and both parts of Ireland.

Dr Brendan Cooper took us for the next session on static lung volume measurements, which lasted until lunchtime. The lunch was provided on-site and was very welcome as the going was fast and furious. After lunch Dr Adrian Kendrick covered gas exchange measurements with Dr Hill taking a session on bronchodilator response until tea. By this stage there was one major concern, which quite a few of the participants were voicing - there were no biscuits with the tea and coffee. It's amazing how the small things in life can cause so much concern!

The practical aspects came next and we were split into three groups to be taken to the Lung Investigation Unit in the Hospital. Because there was a lot of equipment to see and the space was rather cramped some people did have difficulty viewing everything. This was a pity and, although the purpose of the session was to go through practical issues in front of the equipment, it would have been nice to have had a demonstration of the test procedures for reassurance that we are performing in our own labs. to the same high standards that the ARTP expect. At this stage there was a discussion regarding the use of filters on equipment and it did sound as if the use of filters could be a matter of finance rather than safety, and practice did differ from hospital to hospital.

That evening a dinner was organised at a local Chinese Restaurant, the food was excellent and the company very enjoyable. We had great fun getting to the hotel that night.

The following day started at 9.00am and again we were divided into three groups for the interactive sessions covering dynamic/static lung volumes and gas exchange measurements. Then it was teatime. A few of the girls had brought their own digestive biscuits with them and shared them around – it's amazing how a digestive biscuit can be an icebreaker and the central topic of conversation.

Next we were divided into four discussion groups and much to our astonishment Dr Kendrick, who took our group, told us to analyse some patient data sheets and then take it in turns to go to the front of the class and give reports on their conditions to the rest of the group. It was the quickest way to find out if you have underlying angina! At 1.15pm we had lunch, much to the relief of everyone in our group. Once again the food was very good.

After lunch Dr Kendrick talked about long-term oxygen assessment, flight assessment and bronchial challenge testing, following which Clare Newall talked on testing for induced asthma and field based exercise tests. Dr Hill concluded the course.

There was one worrying aspect to the flight assessment component for me; I had to fly back to Northern Ireland. It didn't help matters when Concorde crashed an hour before our flight!

On the whole it was a very enjoyable course, although some of the handouts were rather hard to interpret and I would have preferred smaller numbers for the visit to the Lung Function Unit. But you cannot please everyone all of the time.

I would like to thank everyone who had an input into running the course, as it is very worthwhile.

The Editor would welcome any similar letters or reports on any ARTP or non-ARTP training courses or meetings attended by members. It would be useful to other members to review what is available and it would also allow course organisers to develop the future course content and format. Let us know what you gained from attending and what changes or improvements a course has made to you personally or to your department or to your patients.

"ON THE BLOWER" - Manufacturers' News

1. Manufacturers' Liaison

Firstly can I thank all the manufacturers who supported our very successful Winter Meeting in Blackpool. Both their financial support and their presence at the meeting contributed to its success. I do wish I had an opportunity at the meeting to say nice things about our manufacturers, but you know, when it comes down to it.....I can't bring myself to be nice about any of them !! Maybe next year.

Manufacturers' Report, by Nigel Clayton, from a meeting held on Tuesday 19th December 2002 between ARTP Manufacturer's Liaison, Beaver Medical, Thermo Respiratory Group, Morgan Medical and Pulmolink.

Members present:

Chris Baxter	Beaver Medical
Kevin Budd	Morgan Medical
Nigel Clayton	ARTP
Brendan Cooper	ARTP
Kevin Hogben	Morgan Medical
Alan Moore	ARTP
Derek Pike	Pulmolink
Selwyn Sher	Thermo Respiratory Group
Craig Vivas	Thermo Respiratory Group
Martyn White	Beaver Medical

The meeting was held to discuss issues relating to lung function reference values, quality control software, quality of service and use of the ARTP Forum.

i) LUNG FUNCTION REFERENCE VALUES

Standardised European reference equations have been available since 1983 and updated in 1993 (1,2). Recent audits conducted by the West Midlands and East Midlands groups (3,4) showed that systems using these reference equations do not always give the same values when tested with the same demographic data from four test subjects. The manufacturers were made aware of this problem.

Morgan Medical agreed to ship a disk with the correct reference equations to all their users before 28th February 2001.

The Thermo Respiratory Group agreed to make a reference set amendment disk available to customers shortly for SensorMedics V Max systems to correct the existing small errors. The Jaeger branch was investigating small errors in their female reference sets.

Pulmolink were informed that their practice of setting reference ranges as a percentage of predicted is not an approved method.

Beaver Medical agreed to run test values through their Med Graphics systems and feed the results back.

The reference equations supplied by the manufacturers only allow the users to display reference values and reference ranges in their lung function reports. The manufacturer's liaison committee asked the manufacturers to supply the software to enable the calculation of Standardised Residuals. This is the preferred method for making comparisons year by year on the same patient (5). The adopting of the BTS/ARTP default report form was also discussed and it was agreed to adopt this as soon as possible by all manufacturers.

ii) QUALITY CONTROL PROGRAMMES

Whilst the data relating to volume and gas analyser calibration history is accessible on most systems it is not usually easy to access quickly. The manufacturers were asked to produce and supply software that would enable quick and easy access to all calibration and quality control data in a tabular/graph report serially over time.

The manufacturers were concerned that their service engineers often experience systems, which have not been calibrated on a regular basis (a cause of great concern when we are continually trying to raise the standards of lung function testing throughout the UK). Possibly the software improvements could also incorporate a system lock if the recommended calibration procedure has not been followed.

It was also stated that volume calibration is only as good as the syringe being used to make the calibration. All users should have their syringes calibrated by their supplier on a regular basis (at least annually).

iii) SERVICE AGREEMENTS

The manufacturers were asked to log all service calls and to supply the customer with a job reference number. There should be a service engineer response to the call within two hours and, if necessary, a service engineer on site within 24 hours.

The manufacturers stated that their service engineers occasionally encounter customers who are uncooperative and have no time to answer their questions over the phone. Fault-finding is possible over the phone. This will save laboratory down time, service engineer time and ultimately keep our service costs down. The ARTP will highlight to members on the website to give service engineers time to help over the phone.

The manufacturers are developing fault-finding software which will enable them to link into faulty equipment via a modem and check the operation from their service centres. There is a data protection issue here, which may make this unacceptable to the Hospital Trusts in which we work.

The ARTP asked the manufacturers to review their engineer training protocols and made the recommendation that they attend an ARTP short course in respiratory physiology. This will not be mandatory, but strongly encouraged.

iv) SOFTWARE UPGRADES

The ARTP stated that all manufacturers should supply software upgrades, which correct bugs, reference equation faults etc. free of charge, even if the customer does not have a service contract. Upgrades which provide additional functions are provided free of charge by some manufacturers but not others.

Some of the manufacturers have websites that allow customers to check out their latest software/hardware developments. It was felt that rather than having 'bug fixes' posted on the ARTP site for downloading, it would be better if this information was available on the manufacturer websites with links to these from the ARTP website.

v) ARTP FORUM

The manufacturers were reminded that this Forum is for discussion purposes only and that any form of advertising would incur a charge. The manufacturers expressed some concern about the comments made in the Forum by members that had left them in some difficulty when trying to tender for new business. They requested that moderation of the Forum should be tightened up. It was pointed out to the manufacturers that members were free to express their own views and that these views were neither representative of the ARTP or Trust positions. The problems were no different to those experienced in the United States with the AARC Forum.

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3. Cooper B G et al, An audit of lung function equipment in the Trent region.
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4. An Audit of Pulmonary Function Labs in the West Midlands Mushtaq M et al. Respir Med. 1995 Apr;89(4):263-70

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5. Miller MR, Pincock AC. Predicted values: how should we use them? Thorax 1988; 43:265-267

2. Trade Stand

Lung function equipment

I have had the opportunity in the last few months to visit Morgan Medical, Beaver Medical, MicroMedical and Pulmolink factories in the UK. It is interesting to see the different approaches to production, distribution as well as support of customers, the diversity of facilities and the size of the units. One universal feature is the friendliness and relaxed nature of staff in all these companies. Despite appearing to be "on the other side of the fence" when we are purchasing, we have in common the belief in maintaining standards and raising the profile of lung function measurement in healthcare. It is probably these similarities that enable the good relationship between ARTP and manufacturers to happen.

One theme, which was raised by several companies, was that the lung function market (just like its clinical equivalent in the NHS!) is very much a Cinderella service, and often only represents a small part of the products sold by some of those companies. Compared to the drug company market, the amount of money available is small, profit margins are tight and staff numbers are small (i.e. everybody knows everybody else!). The implications of this for ARTP members, is that there may be little leeway on prices, but competition is tight. Short term, some hospitals will "milk" a good deal. In the long to medium term, all of us will suffer, as some companies cannot compete. This will lead to less diversity and more of a monopoly situation. Relations have gone from strength to strength with ARTP and manufacturers and we look to further cooperation, partnership and improved services for our patients in the future.That's everyone except Kevin Hogben of course!!!

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

The new Breas 403 (I'm sure that's yet another old Peugeot!) has been launched which has a volume cycling option as well as pressure cycling. I believe costs are the same as the 401, and if not why not? I haven't been sent details or had a demonstration, but I'll let you know in the near future. It was good to see most of the major ventilator and CPAP companies at the Winter meeting. I'm sure many of you took the chance to compare machines. Of course the best CPAP of the lot is the ..... (do you honestly think I'd type that?)

Pharmaceutical

Apparently, there are lots of new drugs available. They all cost different amounts, and some have benefits over the others and some don't. If you wish to find out more, I strongly recommend a session on the internet accessing their websites. Do you get the impression I have no new information on drugs? Is there anyone out there who would like to contribute by researching this topic for On The Blower on a regular basis? If yes, please get in touch.

Miscellaneous

Two "high flow" CPAP systems for patients in Type 1 respiratory failure have captured my attention. One is the WhisperFlow 2-60 available from Medic-Aid. This can deliver 28% to 100% oxygen and has a built in oxygen analyser and built in pressure relief valve. Contact 01243 846123.

The other is the Vygon Boussignac CPAP device. This is a superbly simplified circuit which does away with complicated tubing by using what is described as a "virtual valve". It provides a complete range of pressures (5-20 of PEEP) across a range of oxygen levels up to FiO2 of 87% I don't know about prices at this stage but it does look extremely good. To go with it is the Tomtec HME-Booster from Pall. An HME (Heat and Moisture Exchanger) is effectively an artificial nose and humidifies and warms the air for ventilated patients. I don't know the cost of these systems, but if it was cheap, they could be an answer for nasal CPAP and NIV patients who get dried out noses. I recommend contacting Pall medical directly for details (Tel: 02392 302366).

3. Complaints Database and WatchDog.

There has been nothing in my in tray on this for a while. Have we solved all the problems? Generally, a lot of issues get aired on the ARTP Forum, which is summarised in the Forum review in *Inspire*.Please write or email me if you have any problems that we need to discuss.

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

Dr Brendan Cooper, (ARTP Manufacturers' Liaison Officer) Lung Function Department, Nottingham City Hospital, Nottingham NG5 1PB. DDI/FAX (24 hours): 0115 840 2615 Email: chairman@artp.org.uk

GAS ANALYSER LINEARITY CHECKS

NIGEL CLAYTON – ARTP MANUFACTURERS' LIAISON

In the July 2000 issue of *Inspire*, Adrian Kendrick wrote an article on the transfer factor assignment, which formed part of the ARTP National Assessment. In it he states that some devices had no apparent way of assessing the linearity of the gas analysers. Further on he states that one might ask the manufacturer how they assess analyser linearity when the annual maintenance check occurs.

I agree with Adrian that the latest technology can reduce the understanding of what is actually going on when we are making lung function measurements. We must not forget the fundamentals of the measurements especially when teaching new members of staff.

Being a user of "black box" technology, I gave this linearity question some thought. Are the latest systems really different to the old machines where you could physically see the individual analysers and observe a direct gas percentage reading from the glowing LED display? I feel the answer is no.

I have recently spoken to the companies representing Jaeger, Morgan Medical, Medi-soft, Med Graphics and SensorMedics. All five companies stated that their software has the facility to observe the output of all analysers incorporated in their "black boxes". This is usually accessed through a diagnostic screen incorporated in the software. (Med Graphics users need to contact their engineer, as this is password protected. Not the ideal situation I might add.) Some manufacturers display the output of the analysers in millivolts rather than gas percentage. Using either millivolts or percentages, it is a simple process to check the linearity of all analysers incorporated in the system.

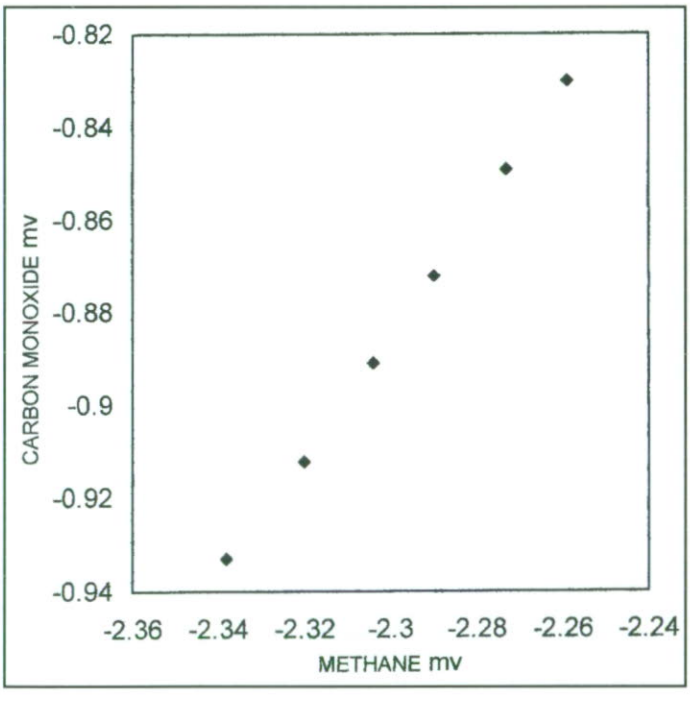
How is it done? Very easily and quickly is the answer. The following method describes the linearity assessment of the analysers used to measure gas transfer factor.

1. Ensure system has been calibrated before commencing the check.
2. Using a 2 litre calibration bladder fitted with a tap, flush and fill the bladder several times with DLCO test gas (CO/He, or CO/CH4, depending on gases used in your system). Do not pressurise by over-inflation.
3. Turn on the sample pump at a flow rate that will not empty the bladder too quickly. (No more than 0.5 litres per minute.)
4. Observe and record the analyser readings either as an output in millivolts (usually available in the service/diagnostic section of the software) or as percentage from the digital read out.
5. Connect the bladder to the gas analyser inlet. (The permapure line may be used on SensorMedics and some Morgan systems)
6. Open the tap on the bladder and observe the millivolt reading, or gas concentration reading from the analysers. Once stable make a note of the readings.
7. Close the tap to the bladder and remove from the sample line.
8. Fill a 100ml syringe with room air and inject in to the bladder thus diluting the remaining gases equally.
9. Reconnect the bladder to the sample line and make a note of the new analyser readings.
10. Repeat steps 7 and 8 at least five or six times.
11. A graph may then be plotted of CO versus HE or CO versus CH4. The graph should produce a straight line demonstrating analyser linearity.

If the graph is not linear, then a repeat check should be made. If this fails then the analysers will require a service from the company concerned.

The following is a worked example.

Methane mv	Carbon Monoxide mv
-2.338	-0.933
-2.32	-0.912
-2.304	-0.891
-2.29	-0.872
-2.273	-0.849
-2.259	-0.83



This procedure may also be used to check the linearity of the CO2 and O2 analysers An exact starting concentration is not necessary, but I suggest using a starting concentration of approximately 90% oxygen / 10% carbon dioxide so that the typical working ranges are assessed.

Once you get to know the inner secrets of your black boxes, you will soon come to realise their workings are not too dissimilar to the systems used more than twenty years ago. The only problems we seem to encounter these days are those related to the computers and software attached to them.

Have fun!

EXERCISE TESTING IN CLINICAL PRACTICE AND RESEARCH
PRESS RELEASE - *Winston Churchill Memorial Trust*

Dr Sue Revill, from Nottingham, is a Clinical Scientist at the Glenfield Hospital in Leicester. In November 2000 she completed a Winston Churchill Travelling Fellowship in Canada

During the 2 months away Dr Sue Revill has been working with one of the leading international researchers in the field of pulmonary disease, Dr Dennis O'Donnell. Based at the Kingston General Hospital and Queens University in Kingston, Ontario, Sue has been looking at ways to assess disability and exercise intolerance in patients with COPD. Sufferers with the disease often experience disabling levels of breathlessness that can impair normal functioning and severely reduce levels of activity. Assessing exercise intolerance is important since most of the therapies available for treating patients with COPD are aimed at relieving breathlessness and improving activity levels.

One such therapy that is well established in North America is pulmonary rehabilitation. This type of exercise-based programmed is becoming increasingly popular in the UK. Patients undergo a controlled programme of exercise training over a 6-8 week period, usually based in a hospital physiotherapy department. At the end of the programme patients are discharged with a lifelong exercise training schedule in order to maintain muscle fitness and control breathlessness.

During her stay in Canada Sue was able to study local pulmonary rehabilitation methods, techniques for examining the changes in lung function during exercise and also set up a research study to measure the responsiveness of different tests following an intervention of pulmonary rehabilitation in patients with COPD.

The Winston Churchill Memorial Trust operates a travelling fellowship scheme, which enables British Citizens from all walks of life to acquire knowledge overseas to the benefit of Community and Country. Approximately 100 awards are made annually with an average duration abroad of 4-8 weeks. Full information on how to apply can be found on the Trust's website: www.wcmt.org.uk or Tel: 020 7584 9315

I asked Sue a few questions about her trip and the work that she had been doing ... Ed

Q. How did you find out about the Trust and what prompted you to apply?

A. I saw an advertisement in the freebie magazine 'Laboratory News'. I applied because I was keen to observe practices outside the UK and also I wanted to understand more about the measurement of lung volume changes during exercise and Dr O'Donnell is a leading exponent of the measurement.

Q. What was involved in the application process?

A. There were three stages. Each year there are about eight different categories and these change from year to year. An initial application of interest with a brief outline of what I wanted to do, where I wanted to go, length of stay etc. After being short-listed from the initial applications I was invited to submit a more detailed application including costings and the names of two references. From the second application I was short-listed to go for an interview at the Trust HQ in London. There were four Trustees who asked questions about the proposed trip, what I wanted to achieve and how this would benefit my work at the Glenfield etc. The Fellowships were awarded about a month after all the interviews had been completed. For the year 2000, 102 fellowship awards were made out of a total of 1400 applications.

Q. What were the aims and objectives of the trip?

A. My main aim was to understand more about the measurement of lung volume change during exercise and to work with another research team for a brief period. Additionally I wanted to learn more about practices in other Healthcare systems.

Q. What were the highlights (and any lowlights) of the trip?

A. The highlight was being able to initiate a research study and recruit 8 patients in the short time I was there. The study was such that I can pick it up back here in the UK. Additionally I had the opportunity of visiting the Canadian Rockies in Autumn which was stunning. The low light was the puritan work ethic with the working day starting at 8.00 am (or earlier if you were really good!) and not finishing until 5.00pm.

Q. What were the main differences and the similarities in testing/rehab between Canada and the UK – staff / equipment etc?

A. There are probably more similarities than differences. The use of body plethysmography is more standard with much less use of helium dilution for the measurement of lung volumes. Testing and rehab is very thorough with everything being done rather than selecting a few tests. I think historically the NHS in Canada was modelled on the UK system, with healthcare free at the point of access. A downside was that it also seemed to have inherited the cumbersome bureaucracy. The training of technical staff was probably more advanced than our system with full time college course for three years (diploma level I think rather than BSc). The lung function labs were staffed by respiratory therapists who were also trained in some kind of technical intensive care, ward based respiratory therapy and sleep laboratory work (separate from lung function).

Q. How are you hoping your findings will change pulmonary rehab in the UK?

A. I am hoping to eventually publish the results from the study when completed, which compares the responses of a number of different kinds of exercise test (field walks and treadmill) to the intervention of pulmonary rehab.

Q. Would you recommend other ARTP members to use the Trust as a possible source of funding for study?

A. Yes, a Fellowship is well worth trying for. You can be away for a maximum of 2 months (or make a case for longer if you wish). It is a good way of focusing what you want to learn and achieve from observing practices in another environment. Also it allows you to pinpoint things that you want to bring back to the UK and incorporate into your own practice and share with the rest of the professional group. It is prestigious for your base hospital as well!

THE ARTP WINTER MEETING 2001

BLACKPOOL

Report by Sue Lowe University Hospital Aintree, Liverpool.

The annual ARTP meeting just keeps getting better. The 2001 meeting was held in the Hilton Hotel, Blackpool that proved to be an excellent conference venue. The theme of the meeting this year was 'Turning the Tide'. This was the theme chosen by our chairman, Dr Brendan Cooper. He spoke of the general feeling of apathy presently felt by us as 'small players in the vastness of the NHS'. He told of how the tide is hopefully beginning to turn, and with the establishment of state registration and all that goes with it, the members of our professional body can hopefully look forward to the national recognition we all deserve. Improved training for us, better career progression and a new understanding of our role by our fellow health professionals will help to lift the low esteem presently felt by a large number of us. But this theme of 'Turning the Tide' also meant something very personal to me. After 22 years as a technician I felt it was time for the 'Tide to Turn' in my own career. I decided to get into research, do a degree and also try my hand at submitting abstracts to the various professional meetings. Feeling that after 22 years and being the grand old age of 40 no one would take me seriously, you can imagine I was surprised to learn that the ARTP had accepted my abstract not only for poster presentation but also for a spoken presentation. What had I done? I didn't expect things to start happening this quickly, but after a lot of thought I realised that if the tide was to turn this was the way forward. I was happy and confident with the work I had carried out; I just hoped that I didn't let my colleagues or myself down at the meeting with my first ever presentation.

The meeting started on Thursday evening with two excellent keynote speakers. Dr Clive Kelly spoke of 'Lung function in Rheumatoid Arthritis and Related Connective Tissue Disorders'. He was followed by Dr Gabriel Laszlo who spoke about 'Respiratory measurement of cardiac output – useful test or an elegant idea?' Both talks were interesting and informative and were the perfect opening to what continued to be an outstanding meeting. Whilst mingling with the manufacturers, who as usual supported the meeting extremely well, we ate 'posh' fish and chips followed by doughnuts and cream cakes washed down with plenty of wine.

Friday morning opened with Brendan's welcome speech, this was then followed by the first plenary session about 'Blood Gas Analysis'. Nigel Clayton and Trefor Watts chaired this session. Mr Philip Gee outlined the physiology behind blood gas analysis. Angela Evans and Julie Lloyd addressed the use of capillary and arterial blood gas techniques, the role of the staff performing these tests and the usefulness of these tests. After refreshments Dr Adrian Kendrick and Melanie Marshall chaired the session entitled 'Lung Function in Extreme Environments'. Looking at physiological challenges of extreme environments on the respiratory system, the limitations of measurements and the usefulness of the results to clinical physiology, Dr Ian Sibley-Calder spoke enthusiastically about 'Diving', Dr Kumar touched the hearts of all the mothers in the audience with a presentation about 'Respiratory Control in the peri natal period' and Jill Lenney looked at 'Flight Assessments'.

Following lunch Steve Scholey and Roger Carter chaired an excellent educational session looking at Basic Respiratory Physiology. Claire Newall, Dr Adrian Kendrick and Sandy Jack talked of Respiratory Mechanics, Gas Exchange and Control of Breathing, respectively. The poster presentations followed and I hope everyone felt encouraged to have a try at putting a poster together themselves for future meetings. Paediatric lung function testing ended the day with Dr Rod Lane, Dr Janet Stocks and Dr Caroline Beardsmore discussing simple and advanced testing and new innovations.

The Gala Dinner was well attended and the ARTP was honoured in being joined by Dr Josep Roca, the President of the European Respiratory Society. Following Brendan's extremely entertaining after dinner speech Dr Roca and Dr Laszlo were both presented with gifts from the ARTP in recognition for their services to Respiratory medicine. The dancing then commenced. Some danced more than others did; some got more hot and sweaty than others and some spent more time in the Prom than others did sobering up. But on the whole a good time was had by all.

Someone with a sense of humour put Sleep Disorders, first on the Saturday morning agenda. Dr Rob Angus and Angela Evans chaired this session that addressed the problems of assessing sleep disorders, understanding the features and role of normal sleep and the way in which it is measured. This was expertly presented by Anwin Evans. An appreciation of the background physiology to jet lag was discussed by Dr Debra Skene. Both did well to address a sleep-deprived audience who stayed awake throughout due to these interesting and well delivered talks. Following coffee the AGM took place and Brendan was once again elected as our chairman. Certificates for the candidates who had been successful in the ARTP examination were also awarded. The President of the ERS, Dr Roca then presented the guest lecture, which looked at the Assessment of training effects in chronic respiratory patients. He discussed in detail the effects of muscle training and endurance in COPD.

I thoroughly enjoyed the meeting. I learned a lot from my fellow colleagues and felt proud to be a member of the ARTP. But the best thing for me was the feeling that I had 'Turned the Tide' in my own career. Even though the computer crashed and the fire alarm went off in the middle of my presentation, I got through that presentation which is something 12 months ago I would never have contemplated doing. I cannot begin to describe the feeling I had when I walked off the stage. I felt at the very least worth something and at best I felt I had conquered Everest. It was the best 'buzz' I had ever had. (And the Gin and Tonic I downed immediately after never tasted so good.) So if I can encourage all of the other members out there to join in the meetings at that level I urge you all to 'Turn the Tides' in your own careers and just do it. I can now look forward to doing the same at the American Thoracic Society meeting in San Francisco this May.

The ARTP is a very supportive and friendly society and as a professional body we show a lot of care and commitment to our patients. It is most touching that we can extend this quality to our own. During the meeting it became known to us that one of our colleagues, Sue Hazard, was unable to attend the meeting through illness. The society members and manufacturers contributed a significant amount, to enable Sue and her family to have a short break at EuroDisney, Paris. I am sure they will all have a wonderful time.

I would like to end by acknowledging all of the staff at the Hilton in Blackpool for looking after us so well, the conference organisers, UCC, for ensuring that everything went off smoothly and lastly (but by no means least) Pat Mitchell for her superb organisational skills, her time and endless effort in making these meetings possible.

ABSTRACTS FROM THE ARTP WINTER MEETING BLACKPOOL 22nd TO 24th FEBRUARY 2001

HEALTH STATUS IN PATIENTS WITH IDIOPATHIC HYPERVENTILATION (IH) IS COMPARABLE WITH PATIENTS WITH SEVERE COPD

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Patients with idiopathic hyperventilation (IH) complain of severe symptoms, which limit exercise performance and restrict their daily activity. We have assessed the impact of these symptoms on health status using the St. George's Respiratory Questionnaire (SGRQ) and compared the results with a group of patients with severe COPD. 50 patients with IH (27F, 23M)mean (SD) age 54.3(11) and 40 patients with severe stable COPD (9F, 31M) mean (SD) age 66(8.5) were studied. Lung function was normal in the IH patients whereas mean (SD) FEV1 in the COPD patients was 0.86 (0.32) litres (31% predicted). SGRQ results are tabulated below;

	SGRQ symptoms activity	SGRQ impact	SGRQ total	SGRQ
IH	73 (20)	80 (20)	56 (22)	66 (18)
COPD	74 (17)	86 (15)	65 (19)	73 (15)

On symptom-limited cycle ergometry cardiorespiratory exercise testing, patients with IH achieved a mean (SD) of 57 (14)% of pred. max. VE and 83(14)% pred. max. heart rate. Patients with IH demonstrate significant exercise limitation and SGRQ scores very similar to severe COPD despite their normal spirometry. These data show that patients with IH have similarly impaired health status to those with severe COPD despite having normal lung function. The distribution of health status impairment is similar in each SGRQ domain, suggesting that impaired exercise capacity, however produced, is a major determinant of poor health care status in both conditions.

IDIOPATHIC HYPERVENTILATION (IHV) DURING WAKEFULNESS AND SLEEP.

S LOWE, S JACK, C J WARBURTON, P M A CALVERLEY

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IHV is a poorly defined condition characterised by inappropriately high resting and/or exercise alveolar ventilation. These patients have a low PaCO2 and symptoms of hypocapnia and dyspnoea, but whether this is psychological or physical in origin is disputed. We studied 10 patients (6F) with typical IHV, mean FEV1 91.95% (±13.46) % predicted and no other cardiopulmonary disease. Their health status was poor (SGRQ 66.89 + 9.99) and their end tidal PCO2 was low at the beginning of exercise (PetCO2 initial 25.4 + 3.37, end 27.5 ± 6.35). All underwent polysomnography with EtCO2 monitoring, which agreed well with PaCO2 during EEG confirmed wakefulness (PaCO2 32.85 ± 3.69; PetCO2 32.60 ± 4.79). Sleep architecture was normal (SOL 17.65 ± 14.10 min; % st1 15.87 ± 7.51; % st2 52.59 ± 8.35; % stREM 14.83 ± 6.35) with a modest arousal index (18.5 ± 13.5) and no evidence of central or obstructive apnea. Mean nocturnal PetCO2 remained relatively low (34.74 ± 3.89) but rose during SWS. Two patients maintained PetCO2 below 30mmHg through all sleep stages and in one it increased significantly in SWS. These data demonstrate the PetCO2 varies with the circumstances and/or breathing route in these patients but persists during sleep. This suggests an underlying disorder of ventilatory control, while the absence of central apnea in the face of sustained hypocapnia points to re-setting of the CO2 recruitment threshold.

AN AUDIT OF REFERENCE (PREDICTED) VALUES USED IN ADULT RESPIRATORY FUNCTION LABORATORIES

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The BTS/ARTP 1994 guidelines for the measurement of respiratory function made recommendations on preferred algorithms to be used for calculating reference values and ranges in adults and children. We undertook a postal survey of all 23 adult respiratory function laboratories in the West Midlands during February 2000 to ascertain whether the recommended algorithms were being used for adults (>=18 years). In addition, laboratories were supplied with four sets of test data and asked to supply responses listing reference values and ranges from their reporting systems.

Five laboratories had their own departmental system for generating patient reports, predicted values and reference ranges; the remainder used manufacturer report generation software provided with pulmonary function systems. Twenty laboratories reported using the ERS 1993 Update Reference set, two laboratories reported using the ECCS 1983 Reference set and 1 using Knudson Cotton Dust Standard (Race Adjusted). Of the 20 laboratories using the ERS 1993 Update Reference set, **all** had errors in either predicted values and/or reference ranges returned. Included in this group were the 5 laboratories with their own departmental systems. Of the 15 laboratories using manufacturer report generation software, the errors were due to mistakes in the system software provided. Only 1 spirometer manufacturer was found to have provided software which yielded correct reference values.

In conclusion, as the equipment in use in laboratories in the West Midlands is typical of that in use throughout the United Kingdom and Europe as a whole, the errors highlighted by this audit are widespread. Manufacturers cannot and should not be trusted to provide correct reference value algorithms; these should be manually verified by all laboratories when commissioning new equipment. All laboratories using their own departmental systems should also carry out checks to ensure that reference values reported are actually correct. As a result of this audit, all the manufacturers who were found to have errors in their software have agreed to provide revised reference sets which are fully compliant with the ERS 1993 Update Reference set to United Kingdom customers.

DO RESPIRATORY FUNCTION LABORATORIES COMPLY WITH BTS/ARTP GUIDELINES ?

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The BTS/ARTP 1994 guidelines for the measurement of respiratory function made recommendations on terminology, units of measurement, pre-attendance advice and assessment of short acting bronchodilator response. We undertook a postal survey of all 23 adult respiratory function laboratories in the West Midlands during February 2000 to determine levels of compliance with these aspects of the guidelines.

Terminology – Only 3 laboratories use the recommended terminology of 'Maximal Expiratory Flow' (MEF_{75}, MEF_{50}, MEF_{25}); the remainder use the American FEF equivalent. Ten of the 23 laboratories use the recommended term of *T*LCO for Transfer Factor; the remainder use the ATS equivalent *D*LCO.

Units of Measurement – All laboratories use the recommended unit of litres for volume. Sixteen of the 23 laboratories use the recommended litres per second for flow and 18 of 23 use mmol min^{-1} kPa^{-1} for *T*LCO.

Pre-attendance advice – Only 4 of the 23 laboratories comply with all the recommendations on pre-attendance advice. Four laboratories give no pre-attendance advice.

Short Acting Bronchodilator Response – Many departments have more than one protocol for assessing short acting bronchodilator response. Only 4 laboratories have protocols which comply with all BTS recommendations and in 5 laboratories none of the protocols comply.

Conclusion – Our results show that there is poor compliance with the aspects of the BTS/ARTP guidelines covered by this survey. Global differences in terminology are unhelpful to laboratories and manufacturers. Pre-attendance advice is not widely implemented. Guidance on measuring short acting bronchodilator response is confusing. The BTS/ARTP guidelines for the measurement of respiratory function are in the process of revision. The working group should ensure that the revised guidelines are more practical. Further, the BTS should ensure that new guidelines do not confuse or conflict with advice in other BTS guidelines.

EXERCISE LIMITATION IN HEART FAILURE

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Exercise intolerance is a major cause of morbidity in patients with chronic heart failure, even when they are on optimal treatment and free of symptoms at rest. Breathlessness is also a common disabling feature in these patients. We therefore investigated the effects of ventilatory and gas exchange abnormalities on exercise capacity in chronic heart failure. Exercise testing was performed in 50 patients with exertional breathlessness due to chronic heart failure and in 30 controls, using continuous transcutaneous blood gas monitoring.

Maximal symptom-limited oxygen consumption (VO2) as a percentage of predicted was reduced in patients (45.3 +/- 2.2%; Mean +/- SE) compared to controls (92.9 +/- 2.5). The ventilatory response [minute ventilation/carbon dioxide production (VE/VCO2)] was significantly increased in the patients compared to controls (45.6 +/- 1.8 vs 24.3 +/- 1.6). The dead space to tidal volume ratio (VD/VT) was elevated in patients compared to controls at rest (0.40 +/- 0.01 vs 0.30 +/- 0.01) and at maximal exercise (0.35 +/- 0.02 vs 0.19 +/- 0.01). There was a significant negative correlation between the VE/VCO2 and the %predicted maximal VO2 in patients but not in controls ($r = -0.67$; $p<0.001$ and $r = -0.24$; $p = 0.06$, respectively). In the patients with cardiac failure the increased ventilatory response was associated with the raised level of VD/VT at maximum exercise ($r = 0.79$; $p<0.001$).

Patients with chronic heart failure have a significant degree of "wasted ventilation" on exertion which is associated with an excessive ventilatory response. The increased ventilatory response on exertion appears to contribute to exercise limitation in these patients. The elevated VD/VT in patients with heart failure is consistent with areas of the lung being underperfused compared to their ventilation. It is likely that the ventilation/perfusion abnormality reflects a limited capacity to increase cardiac output compared to ventilation in patients with cardiac failure.

NON-INVASIVE ASSESSMENT OF GAS EXCHANGE INDICES AND VENTILATORY RESPONSE TO EXERCISE FOLLOWING HEART TRANSPLANTATION

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Heart failure is characterised by an excessive ventilatory response to exercise and an increased degree of "wasted ventilation" as assessed by the dead space to tidal volume ration (V_D/V_T) suggesting a causal link through ventilation/perfusion inequality due to failure to increase cardiac output. We have assessed patients following transplantation to assess the effect of the increased cardiac output on indices of gas exchange and ventilatory response to progressive exercise testing. 50 patients with cardiac failure were assessed prior to and at one and two years post transplantation. All patients performed incremental symptom limited exercise tests during which minute ventilation (V'_E), oxygen consumption ($V'O_2$) and carbon dioxide production ($V'CO_2$) were measured. Ventilatory response ($V'_E/V'CO_2$), anaerobic threshold ($V'O_2$ AT %predicted) and ventilatory equivalent for carbon dioxide ($V'_{EQ}CO_2$) were calculated. Transcutaneous blood gases were monitored throughout exercise testing following an in vivo calibration. The dead space to tidal volume ratio (V_D/V_T) and alveolar-arterial oxygen gradient ($A\text{-}aO_2$) were computed. Despite substantial improvement of subjective functional capacity, heart transplant recipients continue to have limited exercise performance (Maximal $V'O_2$% predicted pre transplant 41.3 (2.2); 1 yr 48.6 (1.7), 2 yrs 54.8 (1.8); $p<0.001$: $V'O_2$ AT% 31.5 (1.1); 35.6 (1.0); 37.9 (1.1); respectively $p<0.05$). Prior to transplantation the ventilatory response to exercise was elevated [$V'_E/V'CO_2$ 45.6 (2.5); $V'_{EQ}CO_2$ (46.9 (2.7) $L.L^{-1}$] and decreased significantly following transplantation [1 yr 34.1 (1.3) and 35.6 (1.4); 2 yrs 32.9 (1.9) and 34.7 (2.0), respectively $p<0.001$]. In addition, despite significant improvement in V_D/V_T after transplantation, it remained higher than normal [Pre transplantation V_D/V_T at maximum exercise 0.35 (0.02); 1 yr 0.31 (0.02); 2 yrs 0.29 (0.02); $p<0.05$]. Although cardiac output is markedly improved after heart transplantation, its response to exercise remains subnormal and this may explain the residual abnormalities of ventilatory and gas exchange responses to exercise.

PRIMARY CARE ACCESS TO RESPIRATORY ASSESSMENT IN COPD: PILOT SCHEME AND FOLLOW UP

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A pilot study of Primary Care direct access to full lung function tests and specialist opinion was undertaken in collaboration with local GPs and Nurses coinciding with the introduction of BTS guidelines for COPD management (Dec'97). A separate area with ansaphone and a dedicated technician was set up within a major lung function laboratory. Assessment as a one-stop procedure [1-2.5 hrs] with return only following steroid or nebuliser trial. 132 patients attended Mar-Nov 1998 of whom 99 were smokers/ex-smokers with no other cause for respiratory symptoms beyond airways disease. 61 current smokers and 38 ex-smokers [mean 41.8 pack yrs]. 39 M [aged 42-83, mean 61.9 yrs] and 60 F [aged 38-81, mean 60.7 yrs]. FEV_1% (BTS categories) 21 normal, 18 mild, 30 moderate, 30 severe airways obstruction. Major recommendations: change of inhaler [35 pts], addition of nebuliser [34 pts], confirmed asthmatic component [19 pts] and anti-smoking advice [11 pts]. A postal follow up at 18-24 months was undertaken to appraise longer term recollection and outcome of the Home Care intervention- 65 responses received: 2 deceased, 5 Royal Mail returns, 1 refused and 2 spoiled. 55 replies analysed: 25 M [aged 43-83, mean 62.6 yrs] and 30 F [aged 38-79, mean 60.3 yrs]. FEV_1% 12 normal, 11 mild, 16 moderate, 16 severe airways obstruction. 18 patients [32.7%] received a nebuliser following Home Care intervention. 5 patients of 32 [15.6%] who were current smokers in 1998 reported smoking cessation. 38 patients [69.1%] reported a positive impact from assessment. The free text comments expressed similar themes: 60.8% mentioned improved confidence and understanding of their condition, 52.6% reported benefit from treatment changes and 21% commented on helpful staff. Feedback from participating GPs and Nurses indicated a high level of satisfaction with the service.

Conclusion: this model of partnership between primary and secondary care in an inner city setting appeared to have a positive and lasting impact in reinforcing appropriate messages to COPD patients. The comments concerning improved coping were reported 18 months after the intervention. Similar arrangements might assist the impact of future anti-smoking and rehabilitation strategies.

DOES POINT OF CARE CAPILLARY HAEMOGLOBIN ANALYSIS IMPROVE INTERPRETATION OF GAS TRANSFER TESTS?

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The aim of this study was primarily to investigate whether using a point of care, capillary haemoglobin (Hb) meter is better than the routine haemoglobin service when correcting gas transfer results. A second aim was to investigate whether an arterialised ear capillary sample was as reliable as a finger stab.

Methods: 24 consecutive patients who were undertaking arterialised capillary blood gas measurement agreed to have a finger capillary measured at the same time. Blood capillary samples were collected for analysis on a portable Haemoglobin analyzer (B-Hemoglobin Photometer. HemoCue Ltd., Sheffield, UK) either from the ear [E] or finger [F] samples and were compared with venous [V] samples collected recently on the hospital pathology service. Analysis used Analysis of Variance followed by 2-tailed, paired student's t-test.

Results: The mean Hb levels were [E] 15.0 ± 2.2; [F] 14.2 ± 2.4 and [V] 13.6 ± 1.6 respectively. The difference in Hb between the ear and finger samples was 0.66 ± 0.59 g/dl ($p< 0.001$) whereas there were no differences between the ear and venous and finger and venous methods respectively. Data expressed as Mean ± s.d.; **$p< 0.01$; *** = ; NS = Not significant.
Extrapolating these results to the effect on correcting the transfer factor shows that the 2% error in Hb estimation would produce a 7% error in TLCO correction.

Conclusion: In routine clinical practice we confirm that at point of testing haemoglobin analysis is as reliable as a remotely sampled venous haemoglobin sample from a routine pathology service. Sampling from arterialised capillary ear samples overestimates Hb by about 14% compared to the finger method. Extrapolation of these differences in Hb measurement to correct gas transfer shows that clinically the difference is of the order of less than 7% (8).

SPIROMETRY - VARIABILITY DUE TO TEMPERATURE CORRECTION ALGORITHMS

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Three spirometers manufactured by the same company were in use in a busy laboratory. After weekly disinfection and cleaning, the heads of the spirometers were interchanged randomly between the bases. A new biological control regimen suggested that the spirometers were giving significantly different readings. A given head was allocated to a set base and monitoring continued. The mean of two best blows from four attempts by one technician were recorded for each spirometer. The disparity was confirmed using a 3L syringe.

Discussion with the manufacturer revealed that each spirometer used a different temperature conversion equation to convert from ATPS to BTPS. Using the given equations to calculate volume at ATPS showed that the disparity lay with the conversion factor. The spirometers were serviced and the same algorithm installed in all. Biological and physical quality control (QC) was continued and shows that the devices now give comparable results.

Table 1. - Biological QC - one month pre and post installation of common temperature conversion algorithm

	PRE mean (sd)			PRE mean (sd)		
Spirometer	**1**	**2**	**3**	**1**	**2**	**3**
FEV1 (l)	2.69 (0.03)	2.97 (0.14)	2.77 (0.04)	2.77 (0.05)	2.81 (0.03)	2.77 (0.03)
FVC L	3.18 (0.10)	3.50 (0.16)	3.25 (0.11)	3.35 (0.04)	3.39 (0.01)	3.33 (0.04)
PEF L.min-1	427 (5)	507 (19)	457(22)	422 (8)	439 (7)	436 (6)

This clearly demonstrates the need for a single common ATPS/BTPS conversion algorithm for each type of volume measurement device before we can hope to have inter-laboratory comparability of results.

CAN A TWO WEEK TRIAL OF CPAP TREATMENT RETURN PATIENTS' PERCEPTION OF VITALITY TO THAT OF THE LOCAL POPULATION?

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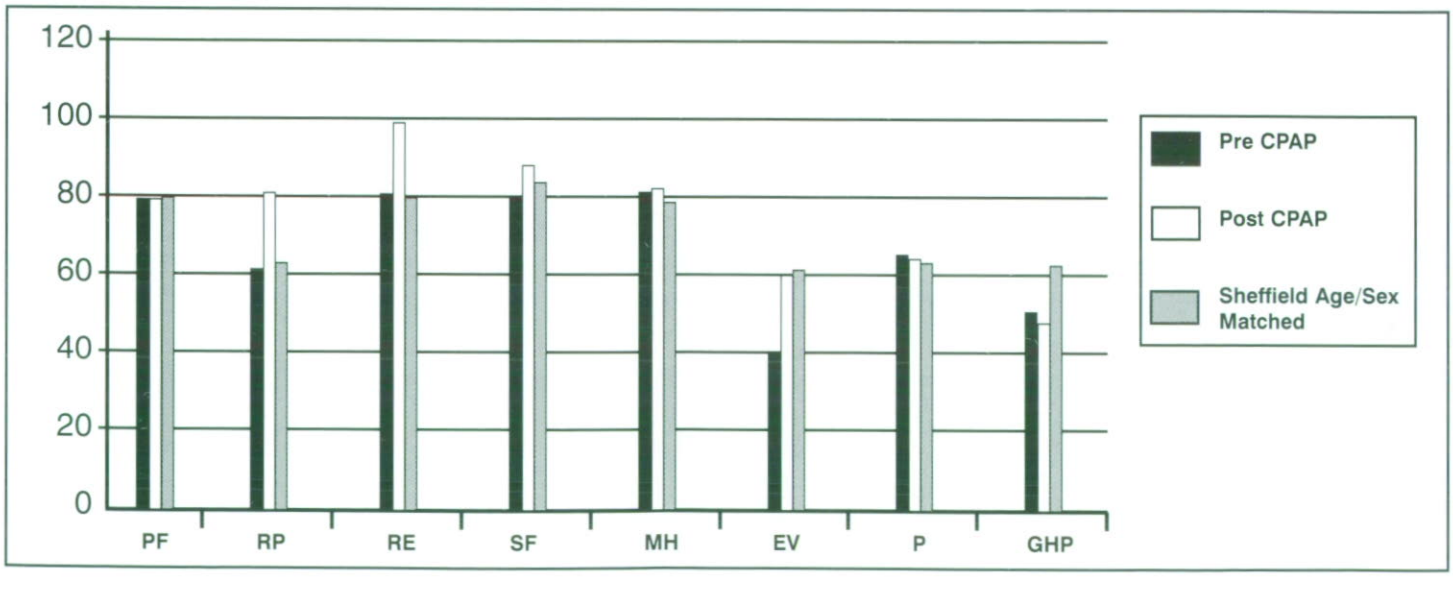
Jenkinson (1) demonstrated that the Short Form 36 health survey questionnaire (SF36) is able to reflect change during continuous positive airway pressure (CPAP) treatment of Obstructive Sleep Apnoea. This study investigated 75 consecutive patients with completion of the SF36 at start and end of a two week trial of CPAP. The response to treatment was remarkably similar to the Jenkinson study. We then age and sex matched each patient who successfully completed the trial with two controls randomly selected from data on the local population held by the Sheffield Centre for Health and Related Research.
The dimensions of the SF36 are Physical function (PF), Role limitation due to physical problems (RP), Role limitation due emotional problems (RE), Social Functioning (SF), Mental Health (MH), Energy/Vitality (EV), Pain (P) and General Health Perception (GHP) Higher scores indicate better health.
Brazier has developed a single index for the SF36 (in press), which enables quality adjusted life years (qaly) to be calculated. The results indicate a return to average social functioning, particularly noticeable in the perception of energy/vitality. The calculation of cost per qaly will provide valuable information.
Ref Jenkinson C et al J. Sleep Res (1997) 6, 199-204.



AN AUDIT OF LUNG FUNCTION EQUIPMENT IN THE TRENT REGION

B G Cooper, J H D Muirhead, H J Briggs, D D Vara, M Jackson, L Knowles, G Martin, F Bradish, J C Waterhouse, L Watson, R E Anthony, C Bradfield, R C Wells, C Roberts, I Caldwell.

On behalf of the East Midlands Respiratory Group c/o Lung Function Department, Nottingham City Hospital, Nottingham NG5 1PB.

The aim of this study was to determine whether the predicted values calculated on lung function equipment were consistent in laboratories in the Trent region. Method: 13 lung function laboratories responded (100%) to the written survey which asked far calculations of predicted adult values for (a) a caucasian male, (b) a black male, (c) a caucasian female, (d) an Asian female as well as paediatric values for (e) a girl and (f) a boy. Values for FEVI, FVC, %, FRC, RV, TLC, VA and KCO were used and compared with the ECCS predicted equations adopted in the BTS/ARTP Guidelines 1993 (Resp Med (1994) 88, 165-194) calculated on an Excel spreadsheet Agreement was considered as being within 200ml volume or 5% of the PC calculated value. Results: The equipment used was manufactured by four companies, Morgan Medical (n = 6), Jaeger (n = 4), SensorMedics (n = 2) and Medgraphics (n = 1) The results for the predicted values appears in Table I and show that overall agreement was on average 60% with a range from 19% to 88%. There was particularly poor agreement on calculation of alveolar volume, but the use of ethnic corrections also caused large differences between centres. Only two centres calculated any paediatric values at all.

	Overall	Morgan	Jaeger	SensorMedics	Medgraphics
	N = 13	N = 6	N = 4	N = 2	N = 1
Predicted a	82%	77%	88%	81%	88%
Predicted b	31%	19%	41%	25%	13%
Predicted c	84%	83%	84%	81%	88%
Predicted d	41%	21%	56%	38%	25%
Predicted e	15%	15%	3%	13%	25%
Predicted f	27%	10%	38%	19%	25%
Mean	**60%**	**50%**	**67%**	**56%**	**53%**

Conclusion: Despite the introduction of national BTS/ARTP guidelines there are still large differences in calculated lung function predicted values even within regime of the UK. More standardization and widespread audit is required to ensure better harmonization of predicted values within UK Laboratories.

E-MAIL FORUM DIGEST

For the benefit of those members who do not yet have access to the e-mail Forum here is a synopsis of some of the messages and discussions that have been 'posted' between November 2000 and March 2001...

Using the medium of the internet to improve communications Forum users are usually first to be notified of all the vacancies and also in this period of ARTP/BTS Short Course details & dates and the new ARTP Sweat Shirts & Polo Shirts (order form available on the website). The Education Committee were also able to notify ARTP assessment candidates that the exam results had been delayed.

Heated (well fairly warm!) discussion about the use of the Forum for **commercial messages** was generated by messages promoting goods and services. The Executive have since discussed this problem and all advertising/commercial information will now only be accepted for circulation via the postal list and charged at the published rates but flyers will also be circulated via the Forum. We will reserve the right to further publish selected items that may be of general interest on the website.

Confusion about **KCO predicted values** between two different manufacturers' machines prompted a report on an investigation into the relationship between Transfer Factor and Alveolar Volume from David Chinn (Teesside Univ.) which was published in the ERJ 1996; 9:1269-1277. He explains why the 1983 ECCS reference values for KCO are unreliable and why the amended 1993 values are better. He also discussed some of the reasons why controversy still exists about the validity of KCO.

An enquiry about the disinfection of noseclips revealed that there is a variety of opinions – Adrian Kendrick (Bristol Royal) is involved in preparing an article for publication on the **disinfection of respiratory equipment.** Definitive guidance on this subject is rather overdue.

The **Medical Devices Agency** set up a new initiative to establish a new advisory group covering a wide range of medical, nursing and scientific expertise. Having only been given short notice Brendan Cooper (ARTP Chair/Nottingham) was able to use the Forum to ask interested members to nominate themselves as experts in aspects of our field when advice is needed.

Catherine Billings (Royal Hallamshire, Sheffield) supplied the following references which offer guides to various **challenge protocols** including advice on equipment for challenge testing.

- Eiser NM, Kerrebijn KF, Quanjer PH. *Guidelines for standardization of bronchial challenges with (nonspecific) bronchoconstricting agents.* Bull Europ Physiopath Resp 1983; 19: 495-514

- Sterk PJ, Fabbri LM, Quanjer PH, Cockcroft DW, O'Byrne PM, Anderson SD, Juniper EF, Malo J-L. *Airways responsiveness: standardized challenge testing with pharmacological, physical and sensitizing stimuli in adults.* Eur Resp J 1993; 6 (Suppl 16): 53-83.

- American Thoracic Society. *Guidelines for methacholine and exercise challenge testing - 1999.* Am J Respir Crit Care Med 2000; 161: 309-329.

Simon Hilldrup. (Morriston, Swansea) asked for information / guidelines covering the issue of **working alone with patients.** Adrian stated that he was not aware of any specific national information and suggested that the issue is normally addressed by the risk assessment team within a given Trust. They are able to advise on the arrangements etc particularly for male staff with female patients and any precautions required within specific areas.

Pulmonary function laboratories are increasingly being asked to carry out assessment of **fitness to fly** in patients with lung disease. Derek Cramer (Royal Brompton) has been on the BTS National Working Party/Committee and was able to give those non-BTS members among us an idea of the probable content of the impending Thorax supplement entitled *'Managing Passengers with Lung Disease Planning Air Travel'.*

In response to a request for recommendations of **text books on exercise testing** the group compiled the following list...

- *Lung Function* JE Cotes
- *Principles of Exercise Testing and Interpretation* K Wasserman, JE Hansen, DY Sue, BJ Whipp, R Casaburi
- *Guidelines for Exercise Testing and Prescription Resource Manual* American College of Sports Medicine.
- *Principles of Exercise Testing and Interpretation* Wasserman K, Hansen JE, Sue DY et al (ISBN 0-683-30646-4)
- *Clinical Exercise Testing* Jones NL (ISBN 0-7216-6511-X)
- *Exercise Physiology* McArdle WD, Katch FI, Katch VL (ISBN 0-683-05731-6)
- *Essentials of Exercise Physiology* McArdle (Pub Feb 2000)
- *Textbook of Work Physiology* Astrand (McGraw-Hill)

We were informed of a little-known form of patient torture! The **saccharin test** involves placing very small pieces of saccharin inside the nose at the 2nd turbinate and waiting to see how long it takes for the patient to taste it. It is used for measuring mucociliary clearance (particularly in CF) and it should normally be tasted within 30 minutes.

Lesley Lowe (Wythenshawe, Manchester) got no replies from the Forum looking for a reference recommending/validating volume calibration by the **NETT protocol.** Anybody else got an answer?

Brendan put out a call for a few members in each NHS Region to act **as co-ordinators of regional audit.** This is following on from the West Midlands quality assurance scheme presented at Blackpool and hopefully extending it to a national level.

Judith Waterhouse (Royal Hallamshire, Sheffield) asked if there was an assessment for **sports scuba diving**. Her department had a patient who knew he was breathless yet tried to go diving. They couldn't put enough weights on him to allow him to dive, when tested his TLC was over 10 litres.

It would appear that there are several divers amongst the membership including our illustrious chairman. Steven Haire (Monklands, Airdrie), an ex diving instructor, tells us that due to nerves a new diver can hyperinflate their lungs and thus increase their buoyancy. A water-side test for this is to have the person hold their knees whilst face down on the surface of the water. As they gradually then exhale their buoyancy will decrease and as they approach FRC volume neutral buoyancy will be achieved. Further exhalation will result in a negative buoyancy and they will sink. If that fails then nerves may be keeping his lungs full (fear of water).

The diver members are intending to send a collective letter to PADI and BSAC suggesting that sports divers should have PFT's as part of the medical for their certification.

Brendan used the Forum to poll members on the question **'Do we have a staffing crisis in lung Function?'.** He is a putting together a report to send to the DoH, BTS, and NHSE. The answer seems to be a resounding 'yes'. Though there was a good response via the Forum I'm sure Brendan would appreciate written feedback from those members not on the Forum.

He would like information on job vacancies in your department over the last 5 years, if possible. How quickly were they filled? What salary was offered and what salary secured the post? Which grades are the hardest to fill? What trainees are in the pipeline and what numbers are expected in the coming year?

Other topics discussed - quality control for blood gas analysers / Devilbiss 40 nebulisers / grading guidelines / filters for nebulised antibiotics / dosimeter protocols for challenge testing.

Forum Tips...

The Forum discussion group service was originally provided by Egroups which has been taken over and is now known as YahooGroups. Though the basic service has not changed to be able to access the web-based features you have to get an ID number from Yahoo. Some members have had difficulty making this conversion. I suspect it may be because though you are able to enter the ID number immediately their database takes a while to update. If you have trouble leave it for a while and try again next time you are online.

A virus alert was notified to the group but turned out to be a hoax! It is worth noting these simple points of prudence...

If you get a virus warning which you are urged to circulate check it before you pass it on. Sites like http://www.symantec.com/avcenter/ (Norton Antivirus Research Centre) will tell you the status of any known virus or hoax. (This is how I knew this one was a hoax).

There are simple basic rules ...

- Don't open attachments if you don't trust where they come from, just delete them.
- Keep an up to date Virus checker on your machine (and use it!)

If you want to join in the discussions on the Forum and get the latest news and information from the ARTP just follow the instructions on the website to subscribe.

The website is regularly updated with the latest information, news, courses and meetings. If you aren't able to monitor the Forum don't forget to keep an eye on the website. The 'Latest Updates' panel on the home page tells you the last 5 updates at a glance.

Keith Butterfield (e-mail: webmaster@artp.org.uk)

ARTP Website – http://www.artp.org.uk

Forum Email Address – forum@artp.org.uk

THE ANNUAL GENERAL MEETING OF THE ASSOCIATION FOR RESPIRATORY TECHNOLOGY & PHYSIOLOGY HELD AT HILTON HOTEL, BLACKPOOL, ON 24th FEBRUARY 2001.

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 Melanie Marshall (MM)
Mr Nigel Clayton (NC)
Mrs Pat Mitchell (PM)
Mrs Angela Evans (AE)
Dr Sue Revill (SR)
Dr Adrian Kendrick (AK)
Mrs Jill Fallen (JF)
Mr Keith Butterfield

Approximately 160 ARTP members were present at the AGM, which opened at 11.15am, immediately following the raffle draw for the "Sue Hazard Appeal".

EXECUTIVE MEMBERS APOLOGIES FOR ABSENCE
Dr Sue Hill (SH)
Ms Gill Butcher (GB)

Membership apologies for absence were received from:
Dr Andrew Robson
Mrs Tess Compton-Price
Mrs Samantha Witticase

INTRODUCTIONS & WELCOMES
Dr Brendan Cooper, Chairperson of the ARTP, welcomed all present to the Blackpool ARTP Annual General Meeting. He thanked the membership for their evaluation of the previous ARTP meeting in Daventry, and confirmed that their appraisals had duly been incorporated into this meeting's format. He stressed the importance that members completed and return their evaluation forms for this meeting such that the ARTP can continually plan to meet the memberships demands.

In his introduction Brendan reported that the ARTP Executive had had a demanding year, having to address several important key changes and events. He confirmed that the role of the ARTP Executive has hopefully evolved into a democratic, openly communicating Committee consisting of several important key players. He then introduced the Executive Committee with the aid of scanned photography, via power point presentation: Julie Lloyd, Honorary Treasurer, Jane Caldwell, Honorary Secretary, Steve Scholey, Membership Secretary, Pat Mitchell, Meetings Organiser, Angela Evans, Education Chairperson, Melanie Marshall, Education Secretary, Keith Butterfield Webmaster for ARTP Website, Jill Fallen Scottish Forum Representative, Sue Revill, Adrian Kendrick and Nigel Clayton, Executive Officers and Jackie Hutchinson, ARTP Administrator. Brendan confirmed that Sue Hill, Past Chairperson, and Gill Butcher, Inspire Editor, were unable to attend this meeting. Brendan acknowledged the efforts of all the Executive Committee members and stressed that in the near future the Committee would be seeking additional help from the membership, especially with respect to education and training issues.

A review of the key achievements obtained in 2000 was then briefly discussed. These included: acknowledgement of the Education Committee and the "Chamberlain Group" collectively working on education and training issues to meet anticipated State Registration requirements. Future work on establishing a BSc syllabus, criteria of competence for an independent respiratory practitioner, Part I &II examinations, Certificate in Spirometry and Occupational Standards, would be at the forefront for these groups during the coming year ahead. Specific thanks were also given to Claire Newall, Queen Elizabeth Hospital Birmingham, for her help in producing the Spirometry Handbook, which could be purchased by post and would also be on sale at the ARTP Educational stand.

During 2000 the ARTP had maintained a strong financial basis and Julie Lloyd, ARTP Treasurer, was acknowledged for her important role in overseeing the finances of the Association. The success of employing an ARTP Administrator had had a dramatic positive effect on the ARTP's achievements for the year 2000 and Jackie Hutchinson was specifically thanked for her efforts, which included the recent collation of the Respiratory Survey Questionnaires. A major achievement had undoubtedly been the establishment and success of the ARTP Website, which was mainly attributed to Keith Butterfield, Wordsley Hospital, who was duly thanked for his achievements. The ARTP Website is now an established interactive medium for exchange of information amongst the membership as well as allowing the Executive Committee to relay important circulation of documents quickly and efficiently between one another.

The Scottish forum has continued to grow from strength to strength, improving links across the borders, between Scottish members and departments. Several meetings had already taken place covering common training and educational issues.

National issues had been at the forefront in 2000 and Sue Hill was specifically thanked for all her hard work in promoting and raising the profile of the ARTP nationally. A series of National Clinical Physiology workshops in 2000 had addressed state registration issues and this process would undoubtedly be repeated in the future. Brendan stated that these achievements had taken considerable efforts from all involved, specifically Sue Hill and this would continue in the year ahead as future objectives were met.

ARTP constitutional issues were discussed at this stage on the AGM. Brendan handed over to Jane Caldwell, Honorary Secretary.

Jane stated that there was one very important constitutional issue. The Honorary Chairman's post was due to end at this meeting after a three-year term. Therefore the Executive Committee had proposed that Dr Brendan Cooper should be re-elected into this post for the next term of office. Jane, on behalf of the Executive Committee and the Membership, acknowledged Brendan's success as Chairman of the ARTP

at this point. The membership were then asked to vote by raising their hands, firstly for and secondly against, this proposal. The proposal was unanimously accepted by the membership and therefore Brendan Cooper was duly re-elected to serve as Chairman of the ARTP for the next three years. **(VOTE ACCEPTED BY UNANIMOUS VOTE).**

Brendan thanked the membership for their support and stressed that he felt proud and privileged to represent the ARTP as the Honorary Chairman.

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

Financial Report, Miss Julie Lloyd.
Julie Lloyd presented the financial accounts for the year ending 31st March 2000. Julie explained that the membership had already received a copy of these for approval and that a copy was also available on the ARTP Website. A breakdown of both income and expenditure during the year was given: The total income had increased when compared to the previous year due to an increase in membership fees, sale of the ARTP Handbook and from circulation of Mail Shots and Job Adverts. However there had also been an increase in expenditure, which included printing costs for the Handbook, expenditure for ARTP Courses and an increase in Executive Committee costs due to the necessary increase in the number of Executive meetings.

Julie then discussed the financial summary of the ARTP 2000 winter meeting at Daventry and reported that income over expenditure for that meeting stood at a credit of £142, which emphasised that the meetings were not profit making and designed to keep the delegate fee as low as possible.
To summarise Julie concluded that the financial accounts for the year ending March 2000 were buoyant with an excess of income over expenditure of £9,001. This balance, along with substantial reserves, gives an overall current financial status, which is stable and healthy. However, Julie confirmed that significant expenditure would occur in the coming year due to our commitment to the State Registration process for Clinical Physiology, Occupational Standards and the appointment of a paid Administrator. Projected finances based on current information should maintain a continued stability with the accounts.

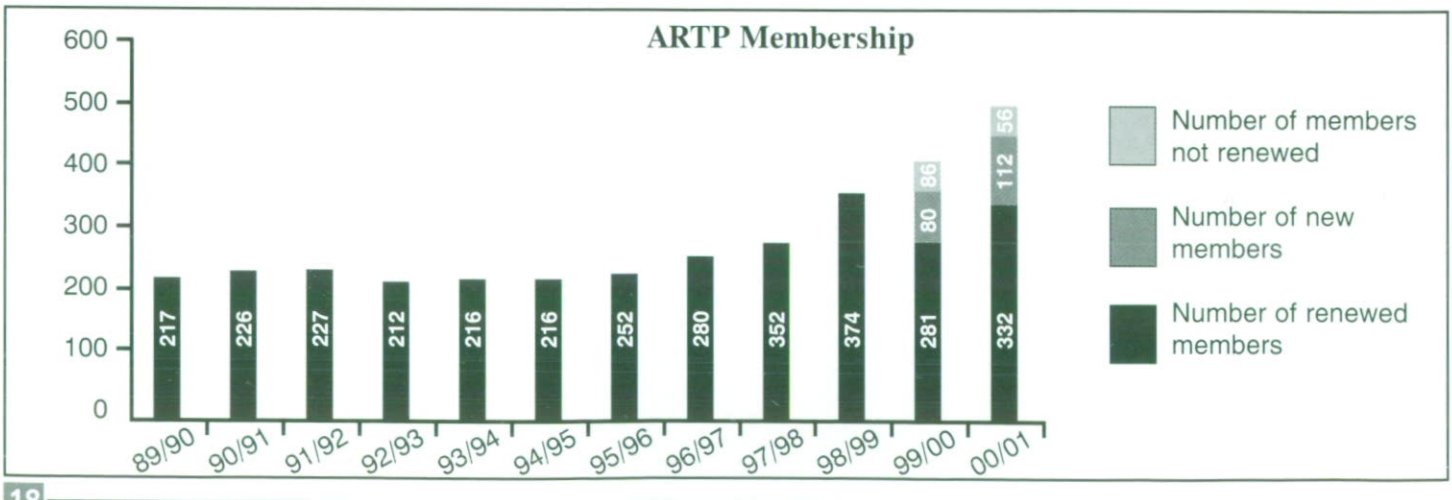
The membership were then duly asked to vote on acceptance of the Tyrell's financial report for 1st April 1999-31st March 2000 which the membership had received via post. **(VOTE ACCEPTED BY MAJORITY VOTE).**

Membership Report, Mr Steve Scholey.
Steve Scholey reported that the membership had increased slightly compared with last year and currently stood at 414 of which 332 had renewed their membership and 82 were new members. However, 56 had chosen not to renew their membership from last year.
A breakdown of different grades was then given. 75% of the membership are MTO2 to MTO5 grades with only a small amount being student or MTO 1 grades. As these members had probably the most to gain from being a member of the ARTP, Steve urged members present to encourage these junior grades to join. As 20 members had failed to state what grade they actually are, Steve reminded members to ensure that all relevant parts of the renewal forms, which would be forwarded in May, were completed as well as amending or correcting any errors.

Steve concluded by stating that whilst membership to the ARTP is not required for State Registration purposes, it should be noted that the ARTP will be the main information conduit during the process and the predominant provider of courses and meetings from which personal continuing professional education and development can be obtained, which is a remit of State Registration. Therefore Steve's final words were that members present should seek to encourage colleagues working in Respiratory physiology to apply for membership of the ARTP.

***Inspire* Report, Given on behalf of Gill Butcher by Julie Lloyd**
Two editions of *Inspire* had been produced since the Last ARTP AGM, with a current aim to produce three editions per year, in December, May & August. Other recent developments include: formation of a Website editorial board which reviews and edits articles put forward for publication in Inspire; inclusion of Abstracts from all future ARTP winter meetings and the registering of Inspire with the British library whereby an ISSN number (1473-3781) will be quoted on all future *Inspire* Journal editions.

Future plans and ideas for development include: update of *Inspire's* front cover; to have the current *Inspire* journal and some back copies available on the ARTP Website; increase income from advertising in *Inspire*; incorporate a correspondence page similar to the Forum group for members not on line; to encourage and increase articles submitted for *Inspire* from members and to increase the awareness of training courses, ARTP and non ARTP, which may be of interest to members.



On behalf of Gill, Julie asked members present to forward any suggestions or ideas for topics which they feel should be included in *Inspire* to Gill directly along with any articles or contributions which might include: HTEC projects, department protocols, case studies, evaluation of meetings or training courses, study or educational days or simply an amusing day at the office!

Gill also wished to express her thanks to the Executive Committee for their help in her new role as Editor of *Inspire*; Catherine Billings, Joan Ashley and Debbie Bower for their proof reading skills and valuable suggestions; Julie Lloyd for presenting this report and to all those who have contributed to *Inspire* during the last year.

ARTP Website Report given by Keith Butterfield
Keith reported that he had been asked at the last ARTP winter meeting to join an editorial team of Committee members whose remit was to design, construct and determine content of a Website for the ARTP. Keith explained that the ARTP purchased a Microsoft FrontPage 2000 Website design package, with the domain name artp.org.uk and subscribed to web space hosted by the Internet Service Provider (ISP) Plus Net.
The Website was opened in September 2000 and has received an average of 300 hits per month since then. Contents on the Website include: Course information; details on Examinations & Assessments; Careers including current Job vacancies; News & information on National Issues and the Scottish Forum have their own Web page.

Keith confirmed that articles removed from the Website were not deleted and could be retrieved using the archive or search facilities. E-mail addresses of all the Executive members were available so specific contact could be made directly with the relevant Executive member. The full list of Executive emails was available on the Committee page on the Website.

A "forum group for discussion" amongst the membership was established on the Website, following Keith's suggestion and is provided by egroups.com (now YahooGroups.com). All members who had supplied an e-mail on their membership form were subscribed to the Forum, new members are automatically subscribed and anyone recently acquiring an e-mail address can join by completing the subscription details on the Website. Despite a lull over the Christmas period, Keith stated that there has been a healthy exchange of ideas on the Forum, carrying about 30-40 messages per month with peaks when topics of general interest are brought up. The ARTP are the first Physiology group to establish a Forum amongst its members, which has improved communications between Laboratories on a national level immensely and has provided some interesting discussions on many varied topics. A similar discussion group exits for the Executive Committee to discuss business, which has also improved Committee communication.

Keith concluded that although the ARTP was not the first to have a Website, comments that he had received from members, manufacturers and other physiology groups emphasise that the ARTP are leading the field in using Internet technology for the benefit of the membership.

ARTP/BTS Liaison Report & State Registration Report, Dr Brendan Cooper (on behalf of Sue Hill)
In Sue Hill's absence, Brendan reported that the ARTP had continued to develop strong links with the BTS and through the forth-coming year this liaison would not only continue to work together on producing joint guidelines and recommendations for practise, but also deal with important issues for joint discussion at BTS Executive level.
A joint BTS/ARTP Symposium would occur at the Summer BTS at Bournemouth.

Brendan reported that major progress had been achieved with respect to National issues, which includes Voluntary Registration. Sue had formed strong links with our fellow professionals and as Chairperson for this Clinical Physiology Group she would continue to represent the ARTP membership's interest. Voluntary State Registration would start to take place in the near future. An update on progress from Sue would appear in due course in the Inspire Journal and on the ARTP Website.

Regional Forum Group Report given by Jill Fallen.
Jill reported that the Scottish Forum group had continued to improve links with its Scottish members, increasing the number of Scottish members attending, with each subsequent meeting. Meetings are planned to take place across the whole of Scotland, such that all parts of the region can be reached. The next meeting would be taking place in Aberdeen on the 27th April 2001.

Jill stated that Scottish Forum News and reports could be obtained on the ARTP Website, which includes relevant contact and meeting details. Jill took this opportunity to thank the ARTP Executive Committee members, her fellow Committee members of the Scottish Forum and the Scottish ARTP members for their support of the Scottish Forum Group.

Pat Mitchell, ARTP Meetings Organiser, then addressed the audience. Specific thanks were expressed on behalf of the ARTP Executive Committee to the Hilton Hotel Staff; Moira Wilson and the Staff of Universal Conference Consultants for co-ordinating the meeting, Manufacturers and Exhibitors for their continued support; her fellow members of the Meetings Committee; and finally to the audience for their attendance. Pat stressed that without their support and commitment to our meetings they would not continue to be as successful as they were proving. She urged the audience to continue their support of successive ARTP meetings and reminded them to complete and return their evaluation forms for this meeting, such that we can continually meet the demands of the delegates.

Education Report, Mrs Angela Evans
Angela reported that 13 candidates had successfully attained the ARTP/BTS professional Examination in 2000. In previous years students had requested that they gained some feedback on their performance and therefore feedback had been included for the first time in the 2000 Examinations. On reflection however, it was felt that this feedback had perhaps been too negative and therefore a review of feedback to candidates would be formulated which hopefully be more constructive in the future.
Angela stated that the format for the 2001 Examinations would still be the same as previously with the registration

closing date on March 2nd, assignments to be returned by 22nd May and practical and vivas starting the week beginning 25th June and over the following three weeks. The membership were reminded that the ARTP Executive had an Exhibition Stand, which members could visit and ask Executive Committee members any specific queries or questions regarding the National Assessments.
The format for 2002 Examinations will change although the actual format had not been agreed upon, but would accommodate state registration needs by having a part I and part II. Part I would be taken after a two year training period and will cover areas similar to the present professional exam and part II would cover the more complex procedures and will take place after 4 years of academic training. An advanced Examination covering specialist areas will also be available in the future.

Angela reported that since 1991 there had been 97 candidates who had successfully obtained the professional examination, with 7 candidates taking the exam in 1991 and 15 in 1999. It is anticipated that 2001 will show a record number of candidates taking the examination.

Angela continued her report by giving an update on the ARTP/BTS Certificate in Spirometry. 18 centres had been accredited by the ARTP/BTS to provide training for the certificate in Spirometry. 21 candidates are currently registered which is expected to rise now that the ARTP Spirometry Handbook is available. The time given for candidates to complete their portfolio and assignments has been proven to be insufficient and therefore a more realistic time of 6 months has been allocated with the further extension of 6 months if required.
Spirometry Handbooks for ARTP members cost £25. Candidates registered with an accredited training centre can obtain the handbook for the same price via the centre, but it is £35 to those not fulfilling these criteria. All enquires and those candidates wishing to register to complete the ARTP National certificate in Spirometry should contact:

Cath Billings,
Registrar for Certificate in Spirometry
Respiratory Function Unit
Royal Hallamshire Hospital
Glossop Road
SHEFFIELD

Angela then concluded her report by explaining the remit of the ARTP Education Committee, i.e. to organise, improve and develop the National Assessment, oversee the Certificate in Spirometry, making changes and improvements if and when necessary. The Education Working party's (Chamberlain Group, which consisted of 10 MTO's and 10 Clinical Scientists), remit was also discussed who are working towards identifying the level of competences and training objectives needed at different levels of training. Together both these groups have an incredibly busy year ahead in terms of production of educational material and therefore anyone willing to help the ARTP on any aspect of education, assessment or training should contact Melanie Marshall (Education Secretary) or Angela Evans (Education Chairman) directly.

The presentation of the ARTP/BTS National Assessments then followed. The Certificates were presented to those successful candidates present, by Dr Gabriel Laszlo, BTS representative and Dr Brendan Cooper ARTP representative. The following candidates were successful:

Samantha Moir, Papworth Hospital	**Sally Gough Award**
Susan Browning, Royal Devon & Exeter Hospital	**Merit**
Wanda Macdonald, Leeds General Hospital	**Merit**
Janette Humphries, Hereford County Hospital	**Merit**
Anne-Marie Gibson, Castle Hill Hospital	**Pass**
Neville Croft, Bradford Royal Infirmary	**Pass**
Angela Kelsall, Wythenshawe Hospital	**Pass**
Myriam Jackson, Grantham & District Hospital	**Pass**
Mary Yau, North Middlesex Hospital	**Pass**
Elisabeth Goldthorpe, Wythenshawe Hospital	**Pass**
Yvonne Starkie, Wythenshawe Hospital	**Pass**
Diane Lunn, Grantham & District Hospital	**Pass**
Alexander Perkins, Margate 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.

The Executive Committee would endeavour to continue with its objectives for 2001, which would include joining forces with other professions under the auspices of the Clinical Physiology group; move State Registration forward with the introduction of the voluntary registration of respiratory physiologists; 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; increase the membership of the ARTP, specifically with a drive to recruit student and junior members; continue to work together with outside agencies to maintain standards and quality; further improve links with the BTS including a Website Link; expand the development of accredited centres providing structured feedback to centres requiring specific help; improve the established partnership with Manufacturers; continue to maintain a solid financial basis; as well as to continue to provide the opportunity for members to attend courses and meetings such as this one, which had proved to be an excellent meeting.

Brendan confirmed that the year ahead would be a busy one with a lot of work scheduled and therefore the Executive Committee would look towards it's membership to help achieve these objectives. He stated he was proud to represent the ARTP and looked forward to the coming year's challenges when the ARTP would be at the forefront in "Turning the Tide" such that poor practise would be eliminated and a recognised, competent, quality State Registered profession would emerge. 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 12.11pm.

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