Scottish Intensive Care Society
NEWSLETTER
Edition 8

# Annual Research Meeting and Annual Scientific Meeting 2002

These meetings followed the same successful format as in the previous year. The Research Meeting was held in the Royal Hotel, Bridge of Allan on Thursday 24th January 2002 and was even better attended that the previous year. This was followed by a most enjoyable dinner, also well attended. The Scientific Meeting took place in the Pathfoot Building, Stirling University on the 25th January 2002.

Peter Wallace (left) hands over the presidency of the society to Alfred Shearer at the Annual General Meeting.

## Annual Research Meeting

After an introduction by Chairman John Kinsella, Tim Walsh presented the first topic - a report on the ATICS Study (Auditing Transfusion in Intensive Care Scotland). This was a collaborative study involving both the SICS and the SBTS, and examined the relationship between the patients' haemoglobin and transfusion practice in a cohort of patients in Scottish ITUS. It ran for a 100-day period between June and September 2001. During this period 40% of patients in participating ICUs were transfused, with an average of 1.8units of blood, and about 13 thousand units were transfused (only 5% of the total for the country). 80% of the patients had no clinically overt significant hemorrhage. Overall, the mean threshold for transfusion was haemoglobin of 7.9, and only 15% of transfusions were initiated on patients with haemoglobin <9. The age of red cells transfused varied from 1-35 days with a mean of 18 days. There was a significant difference in the age of the cells transfused by some of the ICUS - no explanation for this was advanced.

This audit was followed by 3 short research presentations, the first being by Manfred Staber, a SPR at the Western Infirmary, Glasgow. The work had been done with Sandy Binning and Fiona MacKirdy, and was entitled "Admissions for Drug Medicine in Scottish ICUS"; the salient features for this study were that: 40% of first episodes of psychosis are manifested as drug abuse. In the years 1993-1997, 20% of all overdose deaths were associated with paracetamol, This figure fell by 40% in the years 1997 – 1999 and this fall was associated with changes in packaging (push-out bubbles) and restrictions on number of tablets which can be purchased at one time.

The year 2000 showed a rising trend in admissions of patients suffering from drug overdoses to ITUS, there was no seasonal difference (despite the fact that most of us suffer some degree of SAD!) and most admissions were nocturnal (10pm-6am). Two thirds of patients came straight form A & E, and 90% of all OD admissions needed 1PPV, the vast majority for three days or less.

There was a mortality of 7% in 1999 and 6% in 2000 among these patients. Only 18% of OD patients in Scotland reach ICU's, but their cost to the health service averaged £1338 each (calculated on TISS points at £30 a point, so this is probably a significant under-estimate of the cost.) It was estimated that within Scotland 2% of the population aged between 15-54 misuse benzodiazepines.

# Editorial

This is my first year as editor of the newsletter and I have used the same successful format as my predecessor Bill Easy. In fact I would like to convey the gratitude of the society to the former editor. Bill gave up the editorship after sustaining a nasty knee injury while tripping over his dog. He didn't so much fall on his sword as on his pointer. We wish him a speedy recovery.

This is a bumper edition of the newsletter containing as it does reports on the last two SICS Annual Scientific Meetings and research meetings. This is to allow us, in future years, to produce a March Newsletter containing reports of the January meetings.

This year, therefore, we have coverage of the 2002 appearance of Malcolm Fischer who gave us a very personal approach to critical care ethical issues. He also warned us not to be pushed around by the SODS - that's Single Organ Doctors. Professor David Bennett also provided a comprehensive overview into the management of sepsis.

At the 2003 meeting we were informed that the advice our grannys gave us holds true for Intensive Care: Too much sugar is bad for you! If you have a sore stomach, eating may be bad for you and when it hurts to take big breaths why not take little ones. See meeting report for details.

I have included reports on most of the society's activities but as the range and scale of activities is continually increasing it is by no means comprehensive. I apologise if I have missed out anything significant but there is always next year. I would welcome any suggestions for next years edition and plan to go to press in March 2004.

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Lindsay Donaldson then presented her evaluation of the Datex Ohmeda 02 Consumption Monitor. Her conclusions were that it was a useful instrument for measuring breath-by-breath 02 consumption but that its use was limited by instability produced by changes in humidity, leaks and unstable F102.

Kevin Rooney then presented the issue of hyperglycaemia in the ITU. Kevin was at the time the SPR in Intensive Care Medicine in the Glasgow University Hospitals NHS Trust. He began by discussing the detrimental sequelae of

Guest lecturer Malcom Fischer - "Research - the Good the Bad and the Ugly" - made us examine what we are doing in research and why .

hyperglycaemia in the ITU patient, in particular to the brain-injured patient. He outlined the DIGAMI and the Van den Berghe studies. He reminded us that activated protein C in certain circumstances could reduce ICU mortality in some groups of patients by up to 20%, but that tight glycaemic control could reduce mortality by up to 40%. Glycated Hb (HbAic) is known to be a marker of diabetic control and of cardiovascular risk in diabetic patients; it also predicts mortality in non-diabetic people. Kevin went on to outline his study which aimed to assess whether blood glucose and/or HbAic could predict severity of illness in ITU patients. The results of the study were presented and a number of comparisons were made with standard measures of severity of illness. The conclusion drawn from this study was that neither laboratory blood glucose nor HbAic correlated well with SAPS2 or Apache 2 as measures of severity. It was felt that a further study was needed to establish to establish a possible relationship between glucose, HbAic and ITU mortality.

Kevin then outlined a number of studies which needed to be done, including the validation of Van den Berghe's study for non-cardiac patients.

Professor David Bennet then took the chair to present the guest lecturer, Dr Malcolm Fisher, who is, amongst other things, Director of Intensive Care at the Royal North Shore Hospital in St Leonards, New South Wales, and whose chosen topic was "Research - The Good, the Bad and the Ugly".

In characteristic antipodean manner, Malcolm made us sit back and examine what we are doing in research and why we are doing it. It was very refreshing to hear someone say "Shun not the case report in this era of evidence based medicine" and "Beware of dogma".

He offered what appeared simple advice in evaluating others' papers - but simple advice which is all too often lost in the intricacies of intensive care studies - "Is this study valid, Are these patients the same as mine, and does this study mean I should change my practice?"

He touched on the difficulties of doing research in intensive care, the number of variables, the huge number of patients required to prove anything, and the difficulty of weeding out environmental factors. He also gave some useful advice about dealing with grants committees.

He asked why we do research (because we have a question which needs an answer, because we need to expand our CV, because we need a job, because it keeps us current, and above all, because it improves patient care. He referred to the paper by Piper et al in cautioning us "If it doesn't work in animals, it won't work in humans; if it does work in animals it only might work in humans".

He raised a small heartfelt cheer when he said " Meta-analysis - beware anything with a hyphen!" and "Beware the zealot". He clearly believed that meta-analysis should generate a hypothesis rather than change practice.

He is clearly a great protagonist of the use of albumin and cited its well-known value in anaphylaxis, certain volume replacement situations, paediatric heart surgery, severe lung leak, and plasmapharesis, but reminded us that these were all areas where it was known to work but there are no studies to prove it!

In addressing the future progress of ICM, he stressed the importance of large clinical trials, which may involve commercializing research.

He ended by saying that the 5 tasks of a wise Doctor were to be a clinician, a researcher, a manager, a teacher, and to accept the snakes and ladders of medical practice.

His excellent talk was enthusiastically received and (I say this is an entirely complimentary manner), for me, it raised more questions than it answered, making us question what we do, questions why we do it, and question what should make us change our practice.

## Annual Scientific Meeting

This meeting was held on 25th January in the Pathfoot building on the Stirling university campus. After trying an alternative or two, this seems to be the favoured venue. There is adequate space for the workshops (just!) and an adequate and central space for the trade exhibition. This latter provided lots of interest and information for us again at this meeting; this was reflected in the large number of delegates visiting the area.

The first plenary session of the day concerned the development of ITU networks in England and Wales, and we were addressed by Dr Mike Pepperman and Mavis Spencer of the National Patient's Access Team. Dr Pepperman is also a member of the Modernisation Team which produced the Comprehensive Critical Care document. He started by tracing the development of these organizations and stressed the paucity of resource allocated to them. (Touched a chord with many of us there!) The concept of identifying patients according to their need rather than the site wherein they are nursed was stressed- "Critical Care Without Walls", and he felt that the key areas for critical care development were Integration, Network Formation, Workforce Development, and a Data Collection Culture. We were then led into thinking about the interrelationship between capacity and demand, the effect that this and other factors would have on future planning, the importance of communication, ethical issues and of a transfer group overseeing and managing ITU transfers (should these still be necessary after the great new dawn when there are sufficient critical care beds everywhere!) Mike spent some time discussing the development of networks, which he saw as working together with other hospitals and trusts and using common policies and protocols. He felt that networks should have about a hundred critical care beds and would involve cooperation between five to eight trusts. This may be more feasible in the higher population-density areas of England, but will certainly provide challenges inn Scotland and in rural Wales. Their talk concluded with the acronym "PDSA", nothing to do with the Peoples' Dispensary for Sick Animals, but standing for "Plan - Do - Study - Act"

Following coffee, trade exhibition and viewing the posters in the competition, Professor David Bennett was billed to speak to us on "Sepsis". Difficult to know where to start with this topic to an audience of intensivists, so he wisely changed the title to "Sepsis - A Personal View". Despite this, he started with some statistics: the incidence of sepsis is increasing – according to Sands (JAMA 1997) it is 10% of ITU admissions. This figure is about the same in several other studies. Average length of stay in the ITU is 17 days out of a total hospital stay of 28 days. One study estimated that deaths associated with sepsis were 215,000 per annum - roughly the same as deaths secondary to myocardial infarction. He went on to talk about interventions which might reduce the mortality.

He reminded us that the fat content of the diet could radically alter the blood levels of arachidonic acid, which is very pro-inflammatory in tissues. He referred to the paper by Galban (Critical Care Medicine 200; 28:643), which showed that enteral feed high in arginine and omega-3 fatty acids reduced mortality from 32% to 19%. Other papers suggest that this improvement may be limited to post-surgical septic patients. He went on to speak briefly about Bernard's paper (NEJM 2001, 344;699) on activated protein C, and about Drotregogin. He then discussed the effects of hydrocortisone and fludrocortisone on septic patients.

There continues to be a lot of research activity in the field of sepsis, and Professor Bennett outlined the most important areas for us.

The workshops continue to be very popular, and many people whom I spoke to had the same difficulty as I did myself, viz: which ones to leave out! I would certainly like to have gone to them all. The workshops ran twice, once before, and again after lunch, so one did have the opportunity to go to two of them at least.

Professor Bennett added some clarity to the sometimes murky waters of which is the right inotrope, or combination of inotropes to use in particular situations.

Margaret Connelly presented and discussed the practicalities of ITU outreach.

Sally Crofts, Martin Clarke and Elizabeth Steele all had a hand in chairing the presentation of clinical cases in the main auditorium. There were a number of well-presented and interesting cases which made everyone think hard.

Malcolm Fisher led a fascinating and contentious (I think I even heard him say "litigable") workshop in which were discussed errors in trauma management.

The plenary session in the afternoon was a stimulating presentation by Malcolm Fisher on Care of the Dying in the ICU. Malcolm started by inviting us to look at life as a continuum between birth and death. He then marked a point on life's continuum beyond which life cannot be continued with dignity. It is our duty, he said, to decide with each

patient when we have reached this point. To help us in reaching this decision he suggested that we will not only consider objective factors, but may also, inappropriately, use subjective factors such as age, sex, race, productivity, value to society etc. Uncertainty, always present in this field, may be reduced by more information, more opinions and more time, but such decisions are common, difficult and burdensome. Dr Fisher said that in the USA papers suggest that 40% of ITU patients suffer unbearable pain, unwanted ventilation or unwanted resuscitation. (Food for thought indeed!) Australian society permits SNR (Do Not Resuscitate) orders, but they must be written, must stipulate who decided, what is to be withheld, what is to be continued, and who wrote the order.

Dr Fisher suggested that it might be helpful to look at the issue as alternative treatment rather than withdrawal of care. He stressed the importance of the patient and relatives dealing with the same team - the same doctors, the same nurses and the same ancillary staff, and also said that the patient (if possible) and the relatives, whilst not being asked to make the decisions, should feel themselves part of this team. He drew attention to the need for appropriate clothing and attitude, and a clear introduction when meeting with relatives. Before deciding on a DNR order or a treatment limitation decision, it is essential that there is consensus between medical nursing and allied professional staff. Dr Fisher stressed the importance of not asking permission from relatives but of still allowing them to feel part of the decision. He said that it is often helpful to find the leader in the family group. Malcolm went on to talk about after the death of a patient, and how shocked he was when a patient's wife said to him "You stopped looking after me when my husband died."

I am sure that this talk made all of us examine our practice.

The scientific meeting was followed by the Annual General Meeting of the Society.

Bill Easy

# South East Scotland ITU Group 2002

Having somewhat naively missed the appropriate meeting in 2001 and been proposed and seconded (in my absence) for the post of Secretary for the SES ITU Group, Charles Wallis gleefully dumped a pile of files on my desk in January. Things gradually improved from there.

We were aiming to hold several meetings with an "Update in…/Recent advances in…" theme over the year to attract a broader spectrum of trainees. The Western General Hospital hosted the first meeting which reported on the proceedings of the recent Scottish Transplant Group meeting in Stirling. Mr J. Forsythe and Ian Grant expounded the surgical and intensive care aspects respectively.

Professor Ken Hillman from Sydney gave a talk entitled "Medical Emergency Teams" at the Royal in Edinburgh in March. Although under the auspices of the SES ITU Group, the local physicians and surgeons were invited to ensure as 'wide' an audience as possible.

In April the Borders General hosted a meeting entitled "Difficult diagnoses" with three different case presentations. In June at the Royal Hospital for Sick Children there were 5 very different presentations ranging from outcome prediction following paediatric head injury to man-eating fungal infections.

St Johns Hospital hosted the September gathering with a review of the past, present and future at burns treatment in the Lothians. In November our "External" speaker was Dr Simon Baudauin, Senior Lecturer in Intensive Care at Newcastle University who gave an extremely interesting and provocative talk on the pros and cons of weaning units and their potential relevance to the South East of Scotland.

The plan for next year is probably to hold slightly fewer meetings in total (rotating through the various units in the area over a 2 year cycle).

David Semple

Royal Infirmary of Edinburgh

# Education Subgroup Report 2001 - 2002

We are pleased to report that we held a course in Intensive Care Medicine in November 2001 in Stirling. The course was attended by ten enthusiastic trainees ( 9 anaesthetists and one paediatrician) who enjoyed two days of high quality lectures and workshops. The two memorable highlights were the Malcolm Daniels / Rona Patey 'evidence based medicine made easy' enlightening to all of us present, and the inaugural use of the simulator in postgraduate ICM training. We plan to continue the courses with an annual course in Stirling in the spring - all are welcome.

With the introduction of Competency based training and assessment to ICM we feel this is an area that a group of us should try to unravel and so a meeting of Education Supervisors in ICM is planned shortly.

There are now six SpR's in ICM in Scotland and we will be arranging a get together in the next couple of months to look at various issues.

Sally Crofts

January 2002

# President's Report

Alf Shearer took over the presidency of SICS in January 2002.

Taking over the presidency of the Scottish Intensive Care Society at the end of the AGM on 25th January 2002 was an emotional occasion for me. I felt humbly in awe of my predecessors and I was deeply honoured. For me the formation of a Scottish society was a dream in 1988 and that dream came true in 1992. In its eleven years of existence the Society has been a tremendous success as a result of enthusiastic but realistic ambition, talented leadership and nationwide support. The past year has seen much activity in the Society and in the field of intensive care generally.

Dr Cameron Howie deserves accolade for his major contribution as chair of the Audit Group. We are grateful to him for all the hard work, ingenuity and negotiating that has given us a system that we can be proud of. Having recently secured ongoing funding and extended the audit to high dependency care, Cameron handed over the chair last year to Dr Simon Mackenzie and we wish Simon good luck. The Audit Group Annual Meeting in November was well attended and the presentations were all of very good value. Credit is due to Simon, Ms Fiona MacKirdy (Project Director SICSAG), Dr Louie Plenderleith (Honorary Secretary SICS) and all the speakers.

The sequence of having the SICS Research Meeting on the Thursday (23rd January, 2003) with the dinner in the evening followed on the Friday by the Annual Scientific Meeting was a great success again this year. We were fortunate in having excellent presentations from all the speakers and we certainly got our money's worth from Professor Monty Mythen on both days. His finale on the Friday afternoon was a presentation on enteral nutrition that was first class and sent us all away thinking again about current practice. The Society is grateful to all the speakers and to the meeting organisers, Dr Sandy Bining and Dr Louie Plenderleith. Sandy also deserves praise for his role as the local organiser of the ICS(UK) Spring Meeting in Edinburgh in May last year. SICS hosted a session which, although modestly attended, did attract some of the big names in intensive care. They were not disappointed. Papers from Dr Tim Walsh, Dr Simon Mackenzie and Dr Brian Cuthbertson with Dr Simon Harrison were of much interest and very well received. They presented three of the main studies with which the Society has been associated in the last year, namely the Audit of Transfusion in Intensive Care in Scotland (ATICS); the Epidemiology of Sepsis in Scottish ICUs; and the Outcome from Haematological Malignancy in Scottish ICUs. The Society congratulates Dr John Kinsella for a job well done as he hands over the chair of the SICS Research Group to Dr Tim Walsh. The Intensive Care Medicine Course in Stirling last year included nursing staff and again involved the Scottish Clinical Simulation Centre. As Dr Sally Crofts retires from council and passes the chair of the Education Group to Dr Steve Stott, we acknowledge her efforts and those of Dr Graham Nimmo and all the tutors in developing these courses.

Other SICS associated activity has involved:- facilitation of a national forum of Critical Care Delivery Group chairs by Dr Mike Fried; development of an Evidence Based Medicine Group and a very promising web site by Dr Chris Cairns and Dr Brian Cuthbertson; and the production of guidelines for the use of activated protein C by a group co-ordinated by Dr Louie Plenderleith. The use of activated protein C is being audited through SICSAG and all are reminded that we are obligated to this exercise as it was a condition imposed by the Scottish Medicines Consortium when the drug was released last year.

Section 47 certificates are now a statutory requirement for most intensive care patients since the relevant part of the Adults With Incapacity (Scotland) Act 2000 came into effect on 1st July last year. The Clinical Standards Board for Scotland, which is due to be reorganised, is well into the process of producing standards for anaesthesia. Intensive care is on the agenda soon. The process will be helped by the fact that the Welsh will soon have completed their standards for intensive care, which will certainly provide a very useful reference. In September, the National Institute for Clinical Excellence (NICE) issued guidance on the use of ultrasound locating devices for placing central venous catheters that could have medico-legal implications for intensive care.

As the President, I represent the Society at meetings of the Royal College of Anaesthetists Board in Scotland and the council of the Intensive Care Society (UK). Since the AGM of the latter last May, there has been no elected member on the council from north of the border and I am therefore the only representative. With regard to either of these bodies, I am happy to be contacted about any relevant matter.

*A.J. Shearer*

# Society's Eighth Annual Audit Meeting

The Society's Eighth Annual Audit Meeting was held on Friday 22nd November 2002 in the Education and Conference Centre at Stirling Royal Infirmary. Simon Mackenzie from the Royal Infirmary of Edinburgh, Lead Clinician for the Audit Group, commenced the meeting by welcoming the 86 delegates attending.

The presentations began with Malcolm Booth from Glasgow Royal Infirmary informing the delegates of 'A pilot study of Hospital Acquired Infection in Scottish ICUs'. Malcolm provided an update to the presentation given at last year's audit meeting by Ahilya Noone in which she proposed links between the SICS and the Scottish Centre for Infection and Environment Health (SCIEH) to monitor Hospital Acquired Infection (HAI). The aim of these links are to monitor the incidence of HAI in ICUs, antibiotic susceptibility and resistance patterns with the aim to eventually prevent/limit emergence of antibiotic resistance. The pilot Malcolm discussed was proposed to take place as a paper-based exercise at the Southern General Hospital and Glasgow Royal Infirmary between December 2002 and February 2003. The aims of this pilot were to develop a minimum dataset which could be used to guide future modifications to the audit software for inclusion in a larger study.

Manfred Staber, SpR in Anaesthesia and Intensive Care Medicine at the Western Infirmary, presented a "Six Year Review of Self-Poisoning Admissions to Scottish Intensive Care Units". Manfred presented the results of an analysis of the Society's audit data collected between 1995 and 2000. Admissions to ICUs with drug overdose and/or poisoning were identified in the central database using diagnostic categories and key words. Collaboration with the Information and Statistics Division, NHS Scotland, enabled Manfred and the authors to conclude that over a 4-year period, although hospital admissions with drug poisonings had declined, more of these patients required intensive care treatment. It is unclear why this increase had arisen although suggestions from the floor were that this may be due to an increase in the severity of the poisonings or earlier intubation by A&E staff. Limitations in the way that poisonings are recorded on the audit software are likely to have underestimated the incidence throughout the period of the audit.

Ronnie Dornan, Practice Development Nurse from the Borders General Hospital gave a brief run-down on Outreach in Scottish ICUs - present and future. With the assistance of Fiona, Ronnie showed the Outreach screen as it is displayed in Ward Watcher and explained how his hospital made use of this resource. This is a very topical subject which stimulated a lot of interest and questions. It is hoped those involved in Outreach in Scotland may make use of the audit software, particularly to develop a common dataset to enable future comparisons. This brief section demonstrated the need for a meeting specifically on Outreach.

Yadhu Rajalingam, SpR in Anaesthesia at Aberdeen Royal Infirmary gave a high-speed presentation on the "Outcome of patients with haematological malignancies admitted to ICU". Yadhu presented the results of an analysis of the Society's audit data collected between 1995 and 2000. This haematology audit is still ongoing. With questions like: Why do haematological malignancy patients do badly in ICU? What is their mortality? What factors relate to poor/good outcome? and Can we predict poor outcome?, a mountain of information was delivered, showing the enormity of the subject content. The data demonstrated that the outcome following ICU admission is poor but not poorer than that predicted by the APACHE II system. An increase in the length of time in hospital prior to ICU admission significantly increased mortality. Food for thought.

Tim Walsh from the Royal Infirmary of Edinburgh reviewed some of the work of the 'Audit of Transfusion in Intensive Care in Scotland' (ATICS) group. ATICS assessed the haemoglobin levels and transfusion rates in 1,000 consecutive admissions to 10 ICUs in Scotland between June and September 2001. Tim's review of the prevalence of anaemia in Scottish ICUs demonstrated that survivors of ICU have a high prevalence of severe anaemia, with 25% of all ICU survivors being discharged from ICU with a haemoglobin concentration <9g/dL. Tim concluded that it is not known how important this is for functional recovery, quality of life, or long-term survival.

At the ICS Conference held in London, December 2002, Tim presented these data and picked up a prize for the best oral presentation

With the coffee break imminent, Simon Mackenzie demonstrated some changes that are required of the software to improve it as an audit tool for high dependency units as well as intensive care units. The audit group has received requests from staff to have some method of identifying patients as levels 1,2 or 3 on the audit system. The system will be modified to accommodate this in the future. Other modifications in the pipeline include: an audit of Drotrecogin alfa (activated), addition of organ donation fields to assist transplant link nurses and the Scottish Transplant Group and finally, a dataset to assist clinicians identify unusual illnesses, a request received from the Scottish Executive Health Department.

Alan Timmins, Pharmacist from Queen Margaret Hospital, presented some work resulting from a joint collaboration between pharmacists and the audit group: 'Sedative use in ICUs'. The audit involved 8 units (7 ICU, 1 ICU/HDU) and addressed issues of expenditure on sedatives, analgesics, Neuro Muscular Blocking Agents (NMBAs) and the association of these with length of time ventilated. Alan pointed out that as sedatives account for a large

proportion of ICU drug expenditure, there is a need to ensure cost-effectiveness. The results showed a considerable variation in expenditure on sedatives and a varied pattern of use of NMBAs. Also identified was the wide variation between units' costs per day and costs per ventilated day for sedatives. This presentation highlighted the potential advantages of this joint collaboration. Future benefits include standardisation of practices and the preparation of guidelines. We look forward to further collaboration between pharmacists and SICSAG, with equally interesting results.

Kevin Rooney, SpR in Anaesthesia and Intensive Care Medicine at the Glasgow Royal Infirmary then gave an aptly timed presentation on "Blood glucose and ICU outcome". The aim of this audit was to assess whether laboratory blood glucose in the first 24 hours of admission is associated with hospital mortality in a cohort of Scottish ICUs. The lowest and highest blood glucose concentrations were collected prospectively as part of the minimum dataset for the national ICU audit between 1995 and 1997. Results showed that 83% or 10,542 patients were hyperglycaemic in first the 24-hours of ICU. Patients with blood glucose concentrations between 4 and 9 mmol$L^{-1}$ during the first 24-hours of intensive care had a significantly lower mortality than those with hyper (or hypo) glycaemia. It is, therefore, possible that blood glucose in the first 24-hours of intensive care is an independent prognostic factor.

The first session in the afternoon was a joint one on sepsis. Simon Mackenzie began by presenting some of the results from the prospective audit of sepsis, the proposal of which had generated vibrant discussion at the previous year's meeting. The prospective sepsis audit ran successfully between January and May 2002. Simon thanked all units, in particular the nursing staff on whom additional data collection tended to fall. Analyses continue on the data, however, Simon was able to demonstrate that almost half of all ICU admissions developed sepsis early in intensive care, the majority of whom had severe sepsis or septic shock. Hospital outcome data are awaited to complete the analyses and further results will be available in 2003.

Louie Plenderleith then reviewed the evidence to support the use of the drug Drotrecogin alfa (activated). This evidence has been used by the Society to develop a Guideline as a tool to help identify patients with severe sepsis who are most likely to benefit from this drug. This guideline has been distributed to Society members and ICUs. Louie highlighted that the Guidelines are intended to clarify existing information, to improve both risk benefit and cost benefit. Louie introduced Linda Patterson, working on behalf of the Society for 12 months to implement the Guideline and validate the data set designed to complement it. Linda joined the audit group from ICU nursing in Ayr Hospital.

Gill Harris, Audit Nurse with SICSAG, proceeded to present initial data generated from Scotland's developing High Dependency Unit Audit. The data presented were from a 6-month period (April - September 2002) in 25 stand-alone HDUs. There were 7,622 admissions into 176 available beds during that time period. The mean HDU bed occupancy in Scotland was 76.8% with 13 out of the 25 units above this mean. The mean length of stay ranged from 1.8-4.5 days with the Scottish mean being 2.8 days. Readmission rates were identified by the HDU Audit Steering Group as an important quality marker. Gill was able to demonstrate wide variation in readmission rates across the HDUs. It was pointed out, however, that in some units the section on Ward Watcher in which 'Readmission' appears is not always mandatory. When making any comparisons it is important that the data are comparable. These results demonstrate the need to ensure that the dataset is the same across the HDUs.

In October 2002, Gill visited all participating HDUs in Scotland conducting structured interviews with senior staff in each. The results were positive and are being used to assist us in developing the audit further.

This year we had the privilege of having Dr Martin Tweeddale as a Guest Speaker. Dr Tweeddale is Clinical Director, Department of Critical Care, Queen Alexandra Hospital, Portsmouth although he has previously spent a number of years in Canada. As a member of the Canadian Critical Care Trials Group he was a participant in the randomised controlled trial of transfusion requirements in Canada, published in 1999.

Dr Tweeddale entertained us with an overview of three approaches to national critical care data collection, that in Canada which failed at that time, that to which his own ICU contributes in England and the Scottish system. He compared the attributes, costs and benefits of an audit system with the administrative requirements to generate accurate and responsive information. With just a little irony in the presentation, the session transformed into a one-man debate, which was thoroughly enjoyed by the delegates. Dr Tweeddale delighted us with positive criticisms whilst demonstrating the usefulness of the data in the Annual Report 2002. His final comment "Remember: Small is beautiful - the sky's the limit!"emphasised that more meaningful conclusions can be drawn by ICUs in Scotland than he can draw from reports generated in a far bigger national audit in England; that there is still potential to move audit and research forward in Scotland. We look forward to taking up his proposal for future collaboration.

For the first time, linkage with the Information and Statistics Division, NHS Scotland, the Registrar General and NHS Greater Glasgow has enabled the audit group to begin to assess the impact of social deprivation on ICU admissions and mortality. Malcolm Booth, finally saw the day draw to a close, presenting initial results from these analyses. Following a review of post-war deprivation studies, Malcolm demonstrated an increase in both ICU and hospital mortality in Scotland with worsening social deprivation, even when adjusted for age and gender. These results are just the beginning of our work on social deprivation and survival, watch this space.

Giving a brief summary of the meeting, and thanking all the speakers for their participation, Alf Shearer, President of the Scottish Intensive Care Society closed the meeting.

Gill Harris, Audit Nurse
Fiona MacKirdy, Project Director

Scottish Intensive Care Society
Audit Group

# Report of the Scottish Intensive Care Society Annual Research Meeting 2003

Members of the intensive care community in Scotland gathered from far and wide at the Royal Hotel in Bridge of Allan on January 23rd, the afternnon prior to the SICS Annual Scientific Meeting at the University of Stirling.

The afternoon began with Tim Walsh presenting on the work of the Transfusion Research Group of the Society. He reported that with increasing evidence in favour of restrictive transfusion, practice has changed. There is evidence of restrictive transfusion policies being continued after discharge from ITU. However, there is a significant indication that when a patient with a past history of ischaemic heart disease is admitted to ITU while the IHD is inactive, restrictive transfusion policies are being implemented which is an area with limited evidence of benefit.

Professor Monty Mythen.

Pete Andrews then attempted to enlighten us on the criteria for obtaining Medical Research Council funding. It would appear that despite the requirements made of ICM to establish itself as a specialty founded on an evidence base, we will be at a disadvantage relative to other, more established specialties who are able to conform to the specified strategies and format of the MRC. There are indications that this unfortunate situation may change and it is hoped that the history and activities of the SICS would place it in a favourable position to benefit from MRC funding in the future.

Three short research presentations then followed from trainees. Chris Cairns presented an audit of cardiac arrest calls in the Royal Infirmary in Edinburgh which indicated a high incidence of physiological triggers prior to cardiorespiratory collapse and their relevance to outcome.

An important discussion followed regarding the availability of resources in ensuring that these variables are both monitored and recorded. Jyoti Baharani from Aberdeen presented the findings of a national audit of renal failure which was coordinated by the Scottish Renal Registry. The incidence of acute renal failure was greater than expected overall, with a greater incidence and mortality than predicted in the ITU population.

Paul Glen from Glasgow enlightened us on the findings of his study of hepatic blood flow by doppler ultrasound in ITU patients. He has collected an extensive database which is continuing to be analysed with regard to the variability of hepatic artery and portal venous flow.

The PACman trial is an important, randomised, multicentre trial of the use of pulmonary artery catheters throughout the UK. While many units in Scotland chose not to participate, Dewi Williams from Dumfries and Galloway Royal Infirmary established that the clinical equipoise within his unit fuelled enthusiasm for the project. This enthusiasm was rewarded with champagne from the national co-ordinator for recruiting the first patient - altogether an enviable achievement.

Brian Cuthbertson from Aberdeen attempted to co-ordinate interest by proposing clinical dilemmas suitable for multi centre RCTs in Scotland. He suggested a trial of early versus late tracheostomy; a trial of nitric oxide and/or prone positioning for selected groups with severe respiratory failure; and a trial concerning antibiotic use, (early empirical antibiotic therapy versus restrictive guided use.)

Lastly, Professor Monty Mythen made his first appearance of the meeting to entertain us with an account of his sojourn to Duke Hospital, North Carolina. He outlined a different research culture where the funds available seemed not just multiples but exponentials of European equivalents. Consequences appeared to include a degree of compromise to the industrial paymasters and a more competitive culture within academic institutions.

As an annual event this meeting has become a highlight of the intensive care calendar in Scotland. It has indicated the admirable contributions which members of the Society have made to the evidence base for ICM, both on local and national platforms, in audit and in research, both within and out with the Scottish Intensive Care Society.

It is an impressive track record demonstrating the potential of the Scottish ITU community and particularly of the Society with regard to future projects, especially in the context of national collaborative networks.

Kevin Canavan

SpR in Anaesthesia, Glasgow 2003.
Fellow in Critical Care Medicine, Winnipeg, Canada, 2003-05.

# The Scottish Intensive Care Society Annual Scientific Meeting 2003

The Scottish Intensive Care Society's Annual winter meeting continues to grow in popularity with a record number of delegates this year. The two day format commencing with the Research meeting on 23rd January and the Scientific meeting the subsequent day, now seems to be set in stone - not forgetting the all important Annual Dinner sandwiched in between. This year we welcomed a large Irish contingent, thanks to the fortuitous timing of another meeting.

The venue for the gathering was once again the Pathfoot Building of Stirling University, whilst the increasingly difficult task of organisation fell on a dedicated team of people with Louie Plenderleith and Sandy Binning at the helm.

The first address was given by Dr. Julia Wendon of King's Hospital, London who spoke eloquently on a subject which has had a significant impact on our practice in recent years; "Glucose and Insulin - What should we be doing?" With the merriment associated with the annual dinner concluding only a few hours earlier in some cases, she suggested to achieve euglycaemia a 20% dextrose infusion may be just what the doctor should order!

Dr. Weldon commenced with an overview of the neuroendocrine response to prolonged illness and then went on to comment on those earlier papers by Malmberg which had looked at glucose control in relation to myocardial infarction. These had shown a reduction in mortality in diabetic patients with tight glycaemic control using insulin. A similar risk reduction had been observed in patients undergoing coronary bypass surgery using 'GIK' (glucose, insulin and potassium) infusions. Glucose has also been used as a prognostic indicator in cerebrovascular disease where it has been observed that hyperglycaemia results in a higher mortality and an increase in infarct size. Even studies in general medical patients have shown that those individuals with new onset hyperglycaemia have a higher mortality (16%) than both known diabetics (3%) and those with normoglycaemia (1.7%).

However, the basis of her lecture focussed on the work by Van den Berghe in NEJM 2001; 345: 1359-1367 which looked at insulin treatment and glucose control in critical illness. This study was based in a surgical intensive care unit and randomly assigned patients to receive intensive insulin therapy to obtain blood glucose levels of 4.4 - 6.1 mmol/l or conventional treatment. The groups were well matched in all respects. The results showed a mortality in the intensive group of 4.6% vs. 8% in the standard group. Since the mortality in the first five days was the same for both groups, most benefit occurred in those patients who stayed for longer periods of time in the intensive care unit, in particular those with multi-organ failure secondary to a septic focus. Intensive insulin therapy also reduced the overall in-hospital mortality, incidence of bacteraemia, need for renal replacement therapy, blood transfusions, duration of mechanical ventilation and perhaps most interestingly the incidence of critical-illness polyneuropathy.

Whilst considered a landmark paper, Dr. Wendon commented on the difficulty applying such conclusions to a population of general ICU patients who differ in several respects. Firstly, a large number are non-surgical and overall APACHE scores tend to be much higher. There is a particularly high workload associated with this implementation of such a protocol with recordings of blood glucose required every 1-4 hours. Finally, an inability to adhere to this monitoring rigorously could result in a major risk of hypoglycaemia. Dr. Wendon felt that the overall benefit observed was a consequence of both normoglycaemia and insulin administration. The most interesting results she felt were related to a reduction in bloodstream infections and polyneuropathy, especially in the light of our increased usage of steroids. High glucose levels are known to impair both macrophage and neutrophil function.

She suggested that rather than adopt "intensive" glucose control we try to achieve blood glucose levels of 4-7.5mmol/l and aim for early aggressive enteral nutrition. Dr. Weldon then concluded with one thought provoking question "What happens to subsequent glucose control when the patient leaves intensive care?"

Following a brief interlude to restore diminishing glucose reserves with a coffee and some shortbread, it was time to change tack. Dr. George Findlay of University Hospital, Cardiff gave us a highly enlightening talk on "Ventilatory modes and strategies - Anything new?" He opened his lecture with the gratifying news that the mortality associated with ARDS is improving. Why? Most probably as a consequence of changes in supportive measures such as nutrition, antibiotics, fluid volume status and DVT prophylaxis, rather than specific treatment modalities, like nitrous oxide, proning, high frequency ventilation and ECMO. Now that we recognise mechanical ventilation has many deleterious effects, conventional ventilation techniques using high PEEP levels, low tidal volumes and inverse ratios are aimed at reducing the vicious circle of events that promote lung damage. The next portion of his talk focussed on pressure-volume relationships and in particular the importance of hysteresis in maintaining larger lung volumes at a given pressure once expansion has occurred.

He continued by stating that the pathogenesis of ventilator-induced lung injury was due to 3 factors:

volutrauma, shear stresses (atelectrauma) and biotrauma from TNFa and interleukins. Levels of these biological markers are reduced when protective lung strategies using high PEEP levels and low lung volumes are employed. Dr. Findlay went on to describe in depth the ARDSnet study, where traditional tidal volumes (12ml/kg) were compared with low tidal volumes (6ml/kg). There was a large difference in mortality; 39.8% v 31% respectively with an associated reduction in interleuin-6 levels, ventilator days and organ failure days in the low tidal volume group.

The remainder of his talk concentrated on high frequency oscillating ventilation (HFOV). A smug grin immediately appeared on the face of all the paediatric intensivists in the audience while the rest of us listened in trepidation but soon all was to be revealed with total clarity. Essentially we were to consider HFOV as the ultimate low tidal volume, high PEEP ventilation strategy. This mode differs from high frequency jet ventilation where exhalation is passive and there is a risk of gas trapping. Since ARDS lungs are inherently unstable, HFOV can be used to support the lung by increasing the lung volume above the critical opening pressure, achieving the optimum level and keeping it there in both inspiration and expiration, thereby reducing atelectasis. In simplistic terms, he described it as a "super CPAP" system with as oscillator at the end! With HFOV good oxygenation is achieved at lower airway pressures as changes are occurring on the expiratory phase of the hysteresis loop. Research on HFOV in adults with ARDS is sparse but one well conducted American study comparing HFOV and CMV showed no overall difference in mortality and a minimal difference in haemodynamics. However HFOV worked better in those patients with the poorest oxygenation, with the additional benefit that sedation and paralysis are not necessary.

In reply to the question "How should we ventilate the patient with ARDS?" Dr. Findlay advocated we consider four premises:

Dr. Julia Weldon - concluded with the thought provoking question "What happens to subsequent glucose control when the patient leaves intensive care?"

1. Apply sufficient PEEP to minimise cyclical recruitment and derecruitment.
2. Minimise alveolar overdistension.
3. The mode of ventilation is less important.
4. Accept hypercapnia to achieve the first 2 points.

He concluded by saying that most patients with ARDS do not die from hypoxia but rather from an ongoing inflammatory disease, aggravated by mechanical ventilation.

The first workshop session was held immediately before lunch. The workshops continue to remain very popular and well-attended, with most people wishing there were enough time to attend all four options. This year's choices included "PICCO" by Dr. Findlay, who hardly had time to draw breath from his preceding ventilation lecture. The finer points of "Antibiotics by Continuous Infusion" were elucidated by Dr. Wendon, while Prof. Monty Mythen, the keynote speaker for the meeting, extolled the virtues of "Oesophageal Dopplers". The "Clinical Case" scenarios were chaired by Dr. S. Crofts, who maintained an atmosphere of decorum as Kevin Rooney and myself gave individual presentations which included an unusual case of cardiac tamponade and heparin-induced hypoaldosteronism. I'd like to believe we had most of the audience baffled at some stage in the proceedings - but hopefully not the end! During the lunch break there was an opportunity to visit the extensive trade exhibits, as well as the poster presentations. Then the tough decision as to which workshops to leave out had to be made, as the second delivery of each commenced.

## Plenary Session

The plenary session in the afternoon was a fascinating presentation by Professor Monty Mythen, entitled "Hazards of Enteral Feeding in Critically Ill Patients", in which he challenged the widely held doctrine that enteral feeding is best! Professor Mythen started by saying there are many factors responsible for gut motor dysfunction in ICU patients but few methods of monitoring its course. Abdominal distension, pain, vomiting and gastric residual volume have all been used as markers but intolerance of nasogastric feeding remains the most widely used tool.

Our standard of care is such that "We know enteral feeding is good for our patients" but where is the evidence for this? He went on to say only 11 studies have addressed this issue, none of which have more than 100 randomised patients, except one, which is a metanalysis [Moore F.A. 1992, Ann. Surg.; 216:172 - 183]. This review was conducted on 230 surgical patients and had several exclusion criteria such as pre-existing disease, diabetes mellitus, renal failure and low flow states. Professor Mythen understandably questioned whether the conclusions from the metanalysis could reliably be extended to an ICU population. On tackling the old debate of total enteral nutrition versus total parenteral nutrition, again there was no evidence of any benefit of one over the other!

So what can we safely say?

- Enteral feeding in critically ill patients with established organ failure is NOT evidence-based.
- Both peri-operative and post-trauma feeding are evidence-based.

Essentially we have a situation analogous to peri-operative optimisation vs ICU optimisation!

If we do aim to feed patients preferentially using the enteral route how successful are we? One paper revealed this was achieved adequately in only 25% of cases. The evidence for immunonutrition is also scanty. Prof. Mythen illustrated this with one of the key papers promoting the benefits of immune modulation of the diet [Bower et al, 1995; CCM 23: 436]. This study was based on only 14 subjects who, as a result of meeting very stringent exclusion criteria, were essentially trauma patients. He pointed out that if one was to analyse the data reassigning patients to two groups; those who were adequately fed and those who were not, then it could be shown that mortality in the "successfully" fed group was lower.

Having established how inefficient we are at providing enteral nutrition, he went on to pose the question "Could feeding an injured gut be harmful?" Animal studies have shown this may indeed be the case. Fiddian-Green, 1989 suggested that gut ischaemia could be induced by enteral feeding if the blood supply to the gut was already poor, as in occlusive vascular disease. Whilst this problem does not normally occur in a healthy gut, if deprived of >50% of its blood flow this may result in distal ischaemia. Gaddy et al, 1986; South. Med. J. 79 (2): 180-182 described 5 patients in whom continuous jejunal feeding following episodes of hypo-tension resulted in abdominal distension. Subsequent laparotomy revealed infarcted bowel with no evidence of major vascular occlusion. He thus concluded that feeding may have increased the susceptibility of the gut to hypoperfusion.

Prof. Mythen went on to propose that perhaps we should be specifically targeting those patients who will benefit from enteral feeding rather than pursuing this mode relentlessly in all patients. In this respect he suggested the Gastrostim Test may prove useful. Following injection of pentagastrin, a marked decrease in gastric juice pH would indicate a healthy gut, in contrast to a poorly perfused gut where the pH change would be minimal. At the World Congress in Sydney, 2001 Hamilton M. claimed the gastrostim test was 100% sensitive for predicting the overall success of enteral feeding, although this was purely a subjective assessment. Further studies are awaited.

In summary, Professor Mythen concluded that enteral feeding is not a panacea and feeding a dysfunctional gut may be damaging! This left us with the sobering thought that at least in a few patients, could our vascular surgical colleagues actually have been right!

The meeting was then brought to a close by Dr. Shearer and was followed by the Annual General Meeting of the Society. The two day meeting, true to form had proved both enjoyable and informative - roll on the next one!

Elizabeth Wilson

# West of Scotland Intensive Care Society

Another successful year for the society. Membership has increased and we had good attendances at all three meetings held in 2002.

As usual the Registrars Prize was held in February. The winning presentation was by Lisa McGarrity, an SHO from Stobhill Hospital.

In April Dr Alan Peacock, respiratory physician and mountaineer, fascinated us with his exposition on "The Heart and Lungs at Extreme Altitude". The combination of cardio-respiratory physiology and breathtaking slides of the Himalayas was enthralling.

In October Brian McCloskey educated us on the management of the difficult airway in the intensive care Unit with the aid of some archive slides from the Royal Victoria Hospital Belfast. Ironically the amount of trauma passing through his unit has increased since the para-military ceasefire. According to Brian the main cause of major trauma now is the driver of the Vauxhall Astra.

At the AGM John Kinsella informed us of the sound finances of the society before stepping down as Honorary Treasurer. His duties were taken over by Sandy Binning. Liz Wilson replaced Brian Cook on Council.

A new development for 2003 will be the award of a traveling bursary of up to £1000. Its purpose is to fund critical care associated study leave. It was awarded to Kevin Rooney at the Registrars Prize meeting in February 2003. Kevin plans to visit centres in England that have established outreach programes.

We look forward to the coming year in good heart.

Phil Oates

# The Scottish Intensive Care Society

**The Society is managed by a Council and the office bearers are:**

| | | |
|---|---|---|
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| Vice President | Dr James Dougall | Glasgow |
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| | Dr Michael Fried | St John's Livingstone |
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The Scottish Intensive Care Society

Secretary: Dr John Kinsella, University Department of Anaesthesia, Glasgow Royal Infirmary.

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