



Scottish Intensive Care Society NEWSLETTER

January 1996

The Society

This is the first newsletter of the Scottish Intensive Care Society which is now four years old. Before the society existed annual "Scottish Intensive Care Meetings" had been held in the Station Hotel in Perth, with the first in 1988 conceived by the Dundee unit and the next two arranged from the Western General Hospital in Edinburgh. These proved to be very popular and a fourth meeting was organised by the Aberdeen unit. Preliminary discussions had been held during the preceding year leading to a steering group being set up and, at that fourth meeting in 1991, a decision was made to establish the Scottish Intensive Care Society (SICS).

The first president was Dr A.B.M. Telfer and the secretary/treasurer was Dr K. Simpson, both of Glasgow Royal Infirmary. The yearly meeting continued at Perth as the Annual Scientific Meeting of the Society with the inaugural event on 17th January, 1992. Dr I.G. Gray, Dundee Ninewells Hospital, succeeded Dr Telfer as president in 1993. In the following year the increasingly successful annual meeting moved to the current venue at Stirling University and Dr I.R. Armstrong, then at Edinburgh Western Infirmary - now at Edinburgh Royal Infirmary, became the secretary/treasurer.

As well as providing a focus for intensive care in Scotland,

organising the Annual Scientific Meeting and promoting audit, the Society has an important role in co-ordinating and representing the specialty in Scotland. The following are some of the issues which have so far been included in the Society's agenda:- link with the Scottish Home and Health Department; representation on the Intensive Care Society UK's linkman scheme; organ donation; transport of the critically ill; ICU bed bureau; and training in intensive care. Perhaps the most outstanding achievements of the Society to date are the extensive membership, the quality and success of the annual meetings, and the SICS Audit Group national project.



Fiona MacKirdy, Research Nurse, and Mark Livingston, Audit Co-ordinator, in the control centre for the SICS Audit Project at the Victoria Infirmary in Glasgow

The Council

The council of the Society includes three representatives from the North (Highlands, Grampian, Perth, Dundee), two from the East (Lothian, Edinburgh, Borders, Fife), and three from the West (Strathclyde, Glasgow, West of Scotland, Dumfries, Falkirk, Stirling).

The current regional representatives with their predecessors in brackets are:-

North

Dr I. McKenzie, Inverness Raigmore Hospital (Dr R. Johnston)

Dr G. Smith, Aberdeen Royal Infirmary (Dr M.S.P. Macnab)

Dr A.J. Shearer, Dundee Ninewells Hospital (Dr R.E. Webster, Dr I.G. Gray)

East

Dr I.R. Armstrong, Edinburgh Royal Infirmary (Dr D. McKeown)

Dr N. Leary, Melrose Borders General Hospital (Dr I.S. Grant)

West

Dr W. Kerr, Glasgow Southern General Hospital (Dr J.R. Dougall)

Dr J.C. Howie, Glasgow Victoria Infirmary (Dr K. Simpson)

Dr D. McLean, Carlisle Law Hospital (Dr M. Inglis, Dr R. White)

Dr P.G.M. Wallace represents the Intensive Care Society UK on the council.

A.J. Shearer

SICS Audit Project

Following application of the Scottish Intensive Care Society (SICS) for National Projects Funds at the Scottish Office Home & Health Department, a grant of approximately £200,000 was awarded by the Clinical Resource and Audit Group (CRAG) for the implementation of a national audit of intensive care in Scotland. The funds have provided finance for a three year study during which two principal researchers will be responsible for the study's implementation, ensuring appropriate data collection, quality assurance and data analysis. Hardware has been purchased for each participating intensive care unit (ICU) including Apple Macintosh LC475s or equivalent, colour monitors and printers, and modems.

The project utilises the ICU audit package "Ward Watcher", developed by Critical Audit Limited (CAL). This system had been previously on trial in Southwest Thames and shown to be practicable in the ICU environment. However, modifications have been made to meet the Scottish requirements. These

alterations allow the generation of scores and/or mortality predictions by APACHE II, the Mortality Probability Model (MPM) II, on admission and at 24 hours, the Simplified Acute Physiology Score (SAPS) II and the Paediatric Risk of Mortality (PRISM) score. APACHE Medical Systems Inc. has permitted the use of APACHE III predictions in Ward Watcher. Consequently, working in conjunction with this company enables APACHE III scores and predictions to be generated in all Scottish ICUs. This data will be used for further validation of the APACHE III system. Clearly, accuracy of data collection is paramount and a significant component of the study is the quality assurance of 10% of all records quarterly, and clarification of 100% of diagnostic codes.

APACHE III predictions have been generated in Southwest Thames since April 1993 and this will provide comparisons for the Scottish data. The availability of scores and predictions other than APACHE III, including the nationally accepted APACHE II

system, provides wider scope for comparisons.

Ward Watcher permits daily data collection at a local level if desired. However, the minimum data set requires data generated only within the first 24 hours after ICU admission. This includes:- 1) acute admission details; 2) chronic health information; 3) diagnostic coding; 4) acute physiology data, the majority of which involves entry of highest and lowest values; 5) a Glasgow Coma Score, which if sedated will be pre-sedation and estimated underlying; and 6) a TISS (Therapeutic Intervention Scoring System) score.

The nurse dependency scoring system, recommended by the ICS has also been included in the software and along with TISS is being widely incorporated into daily nursing activity and workload analysis.

The Project has now entered its second year and of the 26 units first approached to participate in the study, two withdrew their support as a consequence of staff shortages. Two other units have

since joined and finance is available for the expected recruitment of at least one other. Therefore, of a possible 29, the 26 units currently participating comprise 2 paediatric units, 4 designated High Dependency Units which regularly ventilate patients and 20 designated general Intensive Care Units. The number of physical beds contained within them ranges from 2 to 14 and the number of patients entered into the study is estimated to be approximately 6000 per annum.

Twenty-two intensive care units provided data for the second and third quarters of 1995, including one unit using their own established audit system to collect the minimum data set. A program

was developed to enable import from such systems. Validation of 10% of the data for the third quarter is now complete and, following the rigorous error checking procedures, comprehensive reports on the APACHE III data for that period are currently awaited. By the fourth quarter of the year 23 of the units were contributing data to the project.

The Intensive Care National Audit and Research Centre (ICNARC) is currently developing a data set to meet its objectives. As this has yet to be completed, the final compatibility of the Scottish database with ICNARC's requirements remains unclear. However, the developers of Ward

Watcher will be informed of the requirements and compatibility should be sufficient to avoid the need for units to collaborate separately with ICNARC.

The aims of the study are:-

- 1) The establishment of a structured system to collect Intensive Care Unit clinical audit data comprehensively throughout Scotland. An important aspect of this structure is the validation of a proportion of the data by an external auditor.
- 2) The assessment of the relative merits of a variety of severity of illness scoring systems and their ability to predict outcome.

F. MacKirdy, J.C. Howie

SICS Audit Project System - User Day

A meeting to provide a report of the progress of the Society's national audit was held in the Station Hotel in Perth on the 3rd of November. After an introduction by Dr Howie the first paper was presented by Dr Nigel Leary. This involved a review of the recent survey of Intensive Care provision and demand in England. It is clear that this publication is likely to identify areas which the Scottish Office would wish our audit to address. Some of this data will be provided by returns from a questionnaire which will be sent to all units early in the new year. This will involve areas such as medical and nurse staffing and the basis on which beds are funded. Data on bed occupancy is readily available from our audit and review of the first 6 months of 1995 shows very similar figures to those provided by the survey from England. There was some discussion of the value and feasibility of conducting a survey of the extent of ICU refusal occurring due to unavailability of beds. The English Survey showed no significant difference in mortality between patients refused admission to those accepted for admission thus purporting to question the value of intensive care. I would appreciate suggestions on whether this is an area we should address and how this might most efficiently be done.

Dr Leary's paper was followed by an interim analysis of data taken from the first 6 months of 1995 presented by Mark Livingston. Mark is undertaking a PhD in Medical Informatics which will try to evaluate the relative merits of the various scoring systems we are using to measure severity of illness. His role is to administer the project centrally. He presented data to show that for all of the scoring systems there was a reasonable fit between actual and predicted mortality. At present the fit with Apache II looks best and that with the Mortality Probability Model looks least impressive.

Comparing predicted mortality with that which actually occurs allows the calculation of SMR (Standardised Mortality Ratio). An $SMR > 1$ occurs where actual mortality exceeds predicted mortality for a given scoring system. The Scottish data overall produced an SMR of just over 1 for Apache II and SAPS (Simplified Acute Physiology Score). SMR's for Apache III and MPM were higher. Individual unit SMR's for each of the scoring systems were presented anonymised by allocating a letter to each unit and informing delegates of their own unit's letter at the beginning of the meeting. A fairly wide range of SMR's were found. This was not surprising given the relatively small numbers of patients from each unit. Individual unit SMR's are unlikely to give meaningful information until the database is considerably larger.

Utilisation of the length of stay predictions provided by the Apache III system showed overall a length of stay lower than would be predicted. One unit had a length of stay ratio of 0.7 (ie substantially shorter than predicted) and an occupancy of 100%. Their case for increased resources looks fairly solid.

The third presentation was by Fiona MacKirdy who is the research nurse on the project. She travels the country checking the accuracy of the entered data. Her role is crucial to the project. Without this validation process any conclusions we could draw about the project would be constrained by anxiety about the accuracy of the data on which they were based. While there is the possibility of inflating scores in order to increase predicted mortality and so reduce the SMR it has always been more likely that systematic underscoring would occur. Fiona's data demonstrate that this is indeed the case. She explained that the consequence of

units increasing the accuracy of their data entry would inevitably decrease the SMR's of the majority of units and that of the Scottish data. There was considerable discussion of the difficulties of allocating the most suitable diagnosis. While a process of "pigeon-holing" complex patients will always be difficult, little advice can be given other than choosing the diagnosis which most precisely describes the condition. We will attempt to provide reports of recurring diagnoses which provoke disagreement.

The process of centrally checking diagnoses and requesting clarification where there appears to be a possible error has been abandoned. With only the information typed in the history screen to go on Mark was able to identify only a fraction the diagnostic "errors" identified by Fiona who had available to her the patient notes. Describing the process of admission and the disease process fully as a text entry nonetheless helps us to understand the process which led to your choice of diagnostic category.

The validation process is being progressively refined such that errors identified in the validation reports will be reduced by only including those which are affecting one or more of the scores. I would remind you that such errors are important as they predominantly lead to under-scoring and a consequent increase in SMR. We were able to identify one unit with a low SMR and errors in scoring which predominantly increased their patients scores and a second unit with a high SMR and considerable underscoring. Without validation these units would appear more different than they really are.

The afternoon started with a presentation by Brian Millar who wrote the Ward Watcher software. He explained the evolution of Critical Audit and its relationships

with the Scottish Intensive Care Society and with ICNARC (the audit and research group which functions under the auspices of the Intensive Care Society UK).

Following Brian's presentation there was a full and frank exchange of views between members of the audience and with the panel of speakers (including the chairman). While there was disagreement as to the time involved in completing the data and the extent to which this might detract from patient care, there was a clear feeling that the workload should be reduced to a minimum consistent with generating the required scores. To this end we have critically evaluated the acute physiology screen with priority given to reducing the number of fields rather than maintaining absolute compatibility with ICNARC. In addition we are

removing data which is used exclusively for generation of a PRISM score. A different screen will appear where children < 12 are entered which will require exclusively PRISM data. The consequence of this is removal of the fields for acid base status, platelets, calcium, and one of the two clotting abnormality fields. Prior to performing this upgrade we are going to evaluate whether the number of blood pressure entries can be halved. This is uncertain as one scoring system requires worst systolic values while others require worst MAP's. No promises but we will go down to two if we can justify it statistically.

I would remind you that one of the aims of the project is to evaluate the various scoring systems in terms of predictive power, error rate and range of predictions (only Apache III gives predictions of

length of stay). It is our expectation that the result of this will be to further reduce data entry for any subsequent audit project.

I look forward to seeing as many of you as possible at future meetings. No definite decision has been made as to whether the next update meeting should be in 6 months or in 1 year. Your views expressed to Mark, Fiona or any of the Council members including myself would be greatly appreciated. Lastly I would remind you that this is the Society's database. You are all aware of the information which is being collected and derived. If there are analyses which you believe would be of value or reports which you would like to have as standard please write to us at the Scottish Intensive Care Audit Office based in the Anaesthetic Dept at the Victoria Infirmary, Glasgow.

J.C. Howie

The President

As I come to the end of my term as President of the Society, there are two main areas of concern in which the Society is actively involved in seeking solutions.

Cyclical periods of acute shortage of intensive care beds and of nursing staff to manage the increasing number of referrals are becoming more frequent and more stressful for medical staff. Moves to transfer resources from the secondary to primary care sector have exacerbated the problems for the acute services.

Currently different purchasers fund intensive care in a variety of ways, some based on bed-days, others on case by case activity but every unit has a significant number of long-stay or high treatment cost patients which fall outwith the agreed tariffs and which inevitably result in underfunding of the service. It is difficult to produce a convincing business case for increased beds

and staffing when purchasers see a falling number of patients treated, but increased staffing and resource requirements, unless there can be more robust indicators of outcome and cost/benefit advantages accruing from the increased expenditure.

It is therefore crucial for the future funding and maintenance of quality care standards in intensive care in Scotland that the Audit Study provides clear indicators to purchasers of the real needs of the specialty based on accurate staff dependency scoring, detailed outcome analysis etc. We are fortunate to have the expertise and enthusiasm within the audit group to provide this information and to reflect the needs of Scotland as a whole. At local level the information should provide clinical directors with a robust case to secure adequate funding and staffing levels to meet the clinical demands, or to alter current

practice in the light of outcome predictions and thus use the current resources more efficiently.

The second area for which we require to provide a solution in the future is the management of trauma and particularly inter-hospital transfer of trauma and other medically compromised patients. The problem has been resolved to a large extent in Glasgow and the West, but for the remainder of Scotland, the question of how to provide appropriately trained and experienced staff to manage the transfer of seriously-ill patients has not been resolved, particularly in the more remote areas. It is clear from recent press reports that the public's expectation of quality of care has risen dramatically over the past few years. It is also the case that patients may be well

resuscitated initially, but during transfer deteriorate due to lack of experience in the accompanying personnel, with increased incidence of morbidity and mortality. The Society is actively involved in the discussions on

funding arrangements and protocols agreed on a multiregional basis. The problem requires to be resolved urgently.

The Society has now an established role as the advisory

body on intensive care issues in Scotland, and will continue to gain strength under the leadership of Ian Grant as we welcome him as President for the next two years.



Dr I.G. Gray
President of the Scottish Intensive Care Society
1993 –1996