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**THE  
ANNALS  
OF THE  
SCOTTISH  
SOCIETY OF  
ANAESTHETISTS**

# Scottish Society of Anaesthetists

## Council for 1995 - 1996

### Office Bearers

President	Dr.A.Macdonald, Glasgow
Past-President	Dr.A.L.Forrest, Dundee
Vice-President	Prof.A.A.Spence, Edinburgh
Hon.Secretary	Dr.C.J.Sinclair, Edinburgh
Hon.Treasurer	Dr.D.H.T.Scott, Edinburgh
Editor of the Annals	Dr.I.R.Armstrong, Edinburgh

### Regional Representatives

		retires
Aberdeen	Dr. W.R. Casson	1997
Central	Dr. A. McDonald	1998
Dundee	Dr. N. McKenzie	1997
Highland	Dr. J. May	1998
South East	Dr. R.A. Bowie	1996
	Dr. A. Lee	1998
West	Dr. D. Bennie	1998
	Dr. W.J. Kerr	1996

### Programme for 1996

**Registrars Prize:** Entries to be submitted to the Hon. Secretary by 10th March 1996.

**Annual General Meeting:** Peebles Hydro Hotel 19-21 April 1996

**Trainee's Meeting:** Edinburgh: 14th June 1996

**Scientific Meeting and Gillies Memorial Lecture:** Glasgow 29-30th November 1996

Combined meeting with South Western Society of Anaesthetists

**Golf Outing:** Lanark 30th May 1996

# PRESIDENT'S NEWSLETTER

## DR. ALAN G. MACDONALD



*Dr. Alan G. Macdonald*

It has been a unique privilege for me to have been President of the Society. I am grateful to many people for help and support during this time: firstly, to John Mackenzie for his indefatigable work as Secretary and for once again masterminding an enormously successful Peebles Meeting; he, Ian Levack and Alistair Chambers, were quite exceptional in their efficient handling of the Society's affairs for four years, and we are greatly indebted to them all: my personal thanks also to Mike Telfer and Sandy Forrest for their advice, and to all the Office Bearers for tolerating and joining in the fun of the synchronous posy-presenting at the Dinner.

It is a particular pleasure to congratulate Professor David Carter on his Knighthood, and to thank him for his inspired Address at the Annual Meeting. He and his wife, Ilske, were charming and delightful guests.

The Society enjoyed hosting Dr. Eriks Sliders, from Riga, during his visiting fellowship in April. His visit was arranged by John Mackenzie, and his itinerary planned by Ian Levack. It was extremely kind of Ian and Pamela to accommodate Eriks for most of his stay, which was based in Edinburgh, but also included visits to Dundee, Glasgow, and Peebles, and culminated at the ICS Meeting in Brighton, and the College Scientific Meeting in London. The Society is especially indebted

to Ian, and to all these who helped out in his comprehensive programme. Eriks remarkable report is published in this issue.

The Trainees Meeting in Aberdeen in May, organised by Rob Casson, was excellent, with two specialised topics being presented in depth, by speakers of a very high standard. The Scientific Meeting in November in Edinburgh, organised by David Scott, was also excellent, and attracted a record attendance. An impressive gathering of distinguished speakers presented a range of stimulating papers, which provided a thought-provoking if not worrying scenario for the future. Gavin Kenny presented a brilliant Gillies Memorial Lecture, which included an impressive live demonstration of surfing the Internet.

Junior anaesthetists have been very much in my thoughts this year. SHOs are uncertain about whether they should aim for the old or the new exam system during the next few diets, and they receive conflicting advice: new training programmes are becoming more rigid and more complex: rotations are often imposed at inadequate notice: and grades are being restructured yet again, with the SpR grade being introduced in April. Council hopes that the inclusion of a Trainee Representative on Council will be approved at the AGM: this will strengthen Council awareness of the concerns of junior anaesthetists, and will enhance its ability to provide informed opinion on training and working conditions. Council has also considered how the Society might increase its commitment to teaching: the suggestion of extending the Trainees Meeting from one to two days, perhaps with a pilot run in 1997, will be presented at the AM.

Anaesthetic Departments throughout Scotland are increasingly beset by serious staffing difficulties, as the conflict, between attaining clinical targets set by management, and the maintenance of new training requirements, worsens. All anaesthetists, particularly Clinical Directors, will require firm resolve to resist pressure from Trust Managers, who will not appreciate the high priority which all recognised Departments apply to safety standards and trainee supervision.

I wish to thank our new Secretary, Colin Sinclair, for having so quickly and efficiently picked up the secretarial duties, for all his hard work on behalf of the Society, and for his tremendous help to me personally: also David Scott and Ian Armstrong for their enterprising and fresh approach to their new roles of Treasurer and Editor. The affairs of the Society are in safe hands.



## EDITORIAL

This year sees a major change in the Office Bearers of our Society. Colin Sinclair takes over from John Mackenzie as Hon Secretary, David 'Goldberg' Scott takes over from Ian Levack as Hon.Treasurer and yours truly from Alastair Chambers as Editor of the Annals. I still remember those parting words from Alastair, who I must thank, "Oh, and don't forget the editorial". The editorial - was I supposed to make some profound comment on the state of Anaesthesia in Scotland today, publicly flog contributors whom one has chased for months or merely write the first thing which came to mind? Then it struck me - the editor has the last word and no right of reply!

The Newsletter of the Scottish Society of Anaesthetists was first published in 1960. The man principally responsible for this was Dr.Malcolm Shaw of the Victoria Hospital Glasgow, the then Hon.Secretary and Treasurer. A remarkable man. It now takes three of us to replace him! In 1989 the title was changed to the Annals of the Scottish Society of Anaesthetists under the editorial guidance of Dr.John Murray. His intention was that 'the new title reflect the progress of the Society towards and beyond the year 2000'.

The open letter from Dr.Eriks Slider is one John would have been proud to publish. It stands out in reflecting that progress. The Society helped sponsor Eriks on a four week visit to Scotland from Latvia. His appreciation of the help from the Society, Dr.Ian Levack in particular, and the admiration for the quality of care provided by our members in their professional (and non-professional!) lives comes through clearly. The rewards of such investments in time and effort by our Society are often intangible. However, from tiny acorns, great oaks grow.

Our President delivered an exceptional address this year which in many ways reflects that approach and a theme which deserves further expansion. On the 1st of April 1996, the latest in a series of changes in postgraduate education comes into effect with the introduction of the Specialist Registrar Grade to Anaesthesia. Hospital medicine within the National Health Service is moving towards a more Consultant based service at the point of delivery of medical care. The objective is to improve quality of care in terms of outcome by which ever ruler of measurement one cares to use. It is based on the premise that immediate Consultant care is always best.

If I were unfortunate enough to be ill, who would I wish to decide on what medical care was required and who would I wish to deliver that care? The simple answers to both questions are the same - the person most appropriately trained for the task. If I had a cardiac arrest in the street I would wish to be managed initially by the Scottish Ambulance Service Paramedics, and with all due respect, not by my General Practitioner or a passing Consultant Anaesthetist. Similarly, if that unfortunate event were to happen to me in a hospital ward, I would wish to be treated by the Senior House Officer in Anaesthesia or dare I say it, the Specialist Registrar. That is not to say that a Consultant suitably trained in resusci-

tion should not perform the task. The question is, would the outcome be any better?

The knee-jerk response is 'of course!'. The appropriate response is, that the outcome will only be improved if the training of the individual responsible for delivery of a specified level of medical care is improved and that the level of care they can provide is more clearly defined. Whether that individual is a Consultant or a trainee is peripheral to the argument. The case for an expansion of the Consultant numbers must be made on improving outcome by improving training. To use the title of a well read report, 'Achieving a Balance' of trainee numbers to Consultant vacancies is a consequence of this, not an objective in its own right. As Professor Muir pointed out at this years Scientific Meeting, what is required is a Consultant - led service, not a Consultant - based service. Training requires time and we must have this to develop our Consultant Anaesthetists of the future. A consultant - based service takes no account of the future.

Sir Kenneth Calman envisages a six year training programme for a medical specialist. In Anaesthesia, our College has interpreted this as 2 years in Basic Specialist Training and 4 years in the Specialist Registrar Grade. Many have argued that 6 years is insufficient time to train an Anaesthetist. Others site examples amongst colleagues who were appointed Consultant with six years or less training and are perfectly competent, and in some cases excel in their field. This is undoubtedly true. The difference is that the number of hours worked by trainees in Anaesthesia has been dramatically reduced. The challenges are to maintain and increase our high level of training yet fit this into a reduced available time.

Our College's controversial Training Document at least went some way towards addressing this issue albeit misguided in places. The concepts of modular training and defined levels of supervision at specified stages in training are good but impracticable for most Departments of Anaesthesia. It was recognised early on that merely spending a specified period of training in one particular area of Anaesthetic practice did not necessarily provide the trainee with the breadth of experience available. Out of this grew the concepts of 'Schools of Anaesthesia' and 'Target Based' experience. To many this may seem like re-inventing the wheel or at least a feeling of 'we already do that'. Whatever one's standpoint, the reality is that this debate has focused attention on the need for defining in much more detail our training objectives.

Finally, to those of you who contribute to our meetings, remember the poor old editor. To all our members I would urge you to submit contributions you feel may be of interest to other members. Pictures are worth a thousand words, particularly if you tell me who's in them! Some of the articles in this edition have been reproduced to read as they were presented in an attempt not to lose the excellence of their presentation. It is my intention that the Annals continue to 'reflect the progress of the Society towards and beyond the year 2000' but perhaps plant a few acorns along the way.

SMELLING THE FLOWERS ALONG THE WAY ...  
 ... BUT TENDING THE BUDS AS YOU GO.



*Victoria Infirmary Trainees in 1990*

I agonised for some time about what to take as the topic for this afternoon's Address. I initially thought of talking about the problems associated with anaesthetising for laser surgery in the airway, something which I have unexpectedly found myself having to provide, in the twilight years of my career. This topic might have been educational, and perhaps even mildly academic, but would certainly not have been entertaining enough for a contented audience on a Saturday afternoon at Peebles. That, and other circumstances, persuaded me to something less academic, and although I feel slightly guilty about this, as if I'm rather letting the side down, I take solace in the words of Dr. John Gillies, who, in his Presidential Address of 1950, said: 'The Annual Meeting of the Scottish Society should be predominantly a social occasion'.

The Original Book of Minutes of the Society makes fascinating reading. The account of the Meeting of the Founder Members in the Balmoral Hotel, Edinburgh, on 14th February 1914, records that '1. The name of the Society shall be the Scottish Society of Anaesthetists. 2. The objects of the Society shall be the study of the science and practice of anaesthetics, and the proper teaching thereof, and to conserve and advance the interests of anaesthetists, etc. etc.'. The phrase that interests me is 'and the proper teaching thereof'. No further mention of teaching can be found for 36 years, until 1950, when

Annual Meetings resumed, at Dunblane Hydro, after the War. John Gillies was elected President, and Dr. Leslie Morrison of Edinburgh, and Dr. Campbell Dewar of Glasgow got approval for Registrars Meetings, the first to be held in Glasgow that October, and, just to keep the peace, the second to be held in Edinburgh, three months later. These were held twice annually until 1954, and have been held annually ever since. The Registrars' Prize of £10 was also initiated that year.

The following year, 1951, it was intimated that the Secretary had written to Dr. Marsden, Dean of the Faculty of Anaesthetists, to request that Scottish candidates for the DA might be allowed to sit the papers in Scotland. This was refused, but another approach was made in 1962, and it was agreed.

Since that year, nothing additional has been initiated by the Society in support of the actual teaching and the welfare of trainees, although every Member of the Society individually has a potentially crucial role to play in looking after their junior staff

This is particularly important just now. Trainees can never have been under such pressure as they are now. So many changes are being introduced. The new grade of Specialist Registrar, the new structured training programme over six years, the change in the Fellowship



exam from a three to a two-part exam: the change from HST accreditation to CCST, and, most worrying of all for the trainee, the continued contraction of training posts, with all the anxieties of the fierce competition for the new bottleneck. The trainees need extra support at this time, but unfortunately, they are probably getting less than ever, because so many of their trainers, i.e. the consultants, are increasingly being distracted by the ever increasing conflict between management and medicine, and becoming preoccupied by administrative, committee, and management affairs. The creation of College Tutors some years ago has been a huge success: they do an excellent job, but they have far too heavy a commitment to be able to provide the day-to-day rapport that trainees need; and perhaps other consultants may now hesitate from helping out as much as they used to, for fear of giving conflicting advice. Consultants are away from their theatre lists or from intensive care more than ever. In the Victoria Infirmary Trust, there are at least 35 committees which require representation from our Anaesthetic Department. Many of these have bred sub-committees, or working parties, or audit groups, and we have a juggernaut that seems unstoppable. Junior anaesthetists are the ones who have to deputise for these consultants, when normally they would be in theatre along with them. Even when they are working together, there seem to me to be more interruptions for management reasons than ever before.

My concern therefore is for the beleaguered trainee of today, who must be considerably bothered and bewildered, if not bewitched, at the continuing movement of the goal-posts, and the changing patterns of career needs. We all naturally think that we had it pretty tough in our day, but we had nothing to compare it with, and the stresses nowadays are totally different. For my part, I was fortunate in having supportive chiefs and stimulating mentors at different stages of my career, and there were many other colleagues who would suggest something, or show me something, and, without realising it, would spark off a fresh impetus to my commitment. To illustrate this, I would like to pick out just a few personal snapshots from my own early training, and pay tribute to some of those who influenced my career.

The first anaesthetist I encountered was at the age of four, when a local GP gave both me and my brother chloroform for the removal of tonsils in the local hospital in Nairn. I have no recollection of it, but I was told I had screamed and fought vigorously, and had been held down while they just got on with it.

During the next few years, I had at least three more anaesthetics, all in the dental chair, given by a variety of untrained local GPs, each holding down this terrified screaming boy. These I do remember, very well indeed. I have little doubt that every one was badly hypoxic, I remember the roaring in the ears, the crescendo of sound, the endless falling through space, and the waking up gasping for breath, overbreathing, and vomiting. These were not anaesthetics, they were asphyxiations,

and I wince to think what colour I was, and how many grey cells were rendered ineffective during this so-called anaesthesia. From time to time I've felt slightly reassured to think that perhaps these episodes could explain why I have been so intellectually challenged all my life. Only when I was ten, did I get my first proper anaesthetic from an anaesthetist in Edinburgh Royal Infirmary. He must have done a good job, as I would have been petrified at the thought of yet another asphyxiation, but I have no recollection whatever. I am grateful to that anaesthetist for letting me discover that not all anaesthetics were terrifying.

At that time I met someone who had a big influence on me. The school doctor, who had arranged my admission, was Dr. James K. Slater, who was consultant Physician with an interest in Neurology at the RIE. His eldest son became a close school friend, and I had many holidays with the Slater family both in Edinburgh and in Orkney. Dr. Slater was a kind and caring man, who showed an genuine concern for my problems. I had a terrible stammer, and anyone with a stammer knows how it dissolves your confidence so totally, that you are afraid to say anything. It got me down badly, and perhaps Dr. Slater thought there might be a neurological cause for it. Whatever he thought, he took time to talk with me at length on many occasions, and he encouraged me to go ahead and do medicine. I owe him a sincere debt of gratitude for giving me some self-belief.

He was a remarkable man. He initiated a regular Saturday morning lecture, open to all members of staff and students, at 12 noon, in the East lecture theatre in RIE. He spoke to a packed house every Saturday, demonstrating parkinsonism, epilepsy, multiple sclerosis, etc., flicking his tendon-hammer, tickling his patients with a feather, and eliciting loss of sensation with a gold tie pin. His only concession to the 12 noon start was on those mornings when there was the excitement of a Murrayfield international, when the lecture would be brought forward to 11.30, not so much for the benefit of the audience, but for himself. He never missed a match.

I became a first year medical student in Aberdeen a few years later, not because I had a vocation for it, but because it had become a family tradition. My introduction to anatomy in Second Year was the big breakthrough. Approaching Marischal College, and crossing the quadrangle seemed quite inspiring to me at the time, but going under the corner arch and down the steps to the Anatomy Department, The Drain as it was known, was forbidding, and the unforgettable smell of formaldehyde hit us at forty yards. The opening lecture was however also unforgettable: the lecture room was packed, with some students having to sit on the stairs; Professor Lockhart had a querulous slightly shaky voice, giving the impression that he was just as nervous of us, as we were of him. He stood at the front, waited until there was complete silence, and then began: 'There is no magician's mantle to compare with the

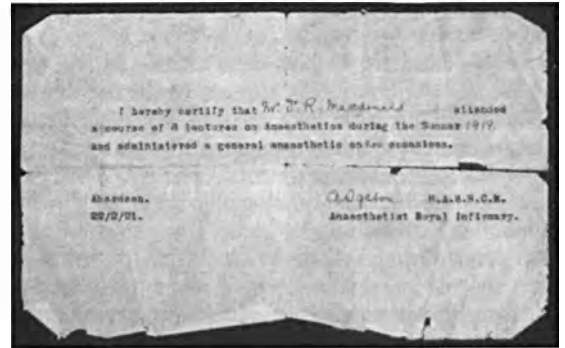
skin, in its diverse roles of waterproof, overcoat, sunshade, suit of armour and refrigerator, sensitive to the touch of a feather, to temperature and to pain, withstanding the wear and tear of three score years and ten, and executing its own running repairs.' I was completely bowled over by his lecturing, and from that moment anatomy became a fascinating study, and I was grateful to Professor Lockhart for being the stimulus to me discovering a subject in which I actually came top in a class exam. It never happened again, but it gave me a terrific boost, and then in the degree exam, examined by the External, Professor George Wyburn from Glasgow, the entire dissection viva and oral was on the larynx, the spinal canal, and the ante-cubital fossa, more like the Primary FFA than 2nd MB. I knew them all cold, and gained a distinction. How strange that I should later become an anaesthetist.

I have less clear memories of the clinical years at Foresterhill, but two surgeons stand out. Mr. Andrew Wilkinson, later Professor of Surgery at Great Ormond Street, was Senior Lecturer in Aberdeen. A great showman, he never missed an opportunity to make a drama out of a crisis. On one occasion, he was lecturing on colorectal surgery, and trying to impress on us how patients could continue to enjoy a perfectly normal lifestyle after adomino-perineal resection. He described a private dinner party he had attended after a concert at the Wigmore Hall. At this party, there was, he said, Lady Anthea Townsend, the Hon Mrs. Helen Browning, Miss Edith Haddington, Mr. Henry Stevenage QC, Colonel Jeremy Tweddell, Mr. Frederick Trevelyan, and Lord Evesham (these names are now, I hope, fictitious!): a very distinguished party of guests, and Mr. Wilkinson told us he had a thoroughly good evening, but he could scarcely contain himself in the knowledge that, around that dining-table, he was the only one with a rectum.

The other surgeon to make a lasting impression on me, and I suspect on most people who met him, was Mr. Hugh Dudley, later Professor of Surgery at St. Mary's. He terrified most students with his imperious manner, and we avoided eye contact with him if at all possible. However, during my final year, I did a three week student locum in his female surgical ward. On my first receiving night, I was in terrible trouble, after an awful day. It was nearly midnight, and I was trying to get up a drip on an elderly man with an obstruction, badly dehydrated and with collapsed veins. I had had several unsuccessful goes in each arm, and was doing a cut-down in his ankle, when the ward doors swung open and Mr Dudley strode in, looking particularly menacing in his short-sleeved white coat. He said 'what the hell do you think you are doing, you should never have to do a cut-down'. He put a blood pressure cuff on the man's arm, inflated it to 40mm Hg, got a large basin of hot water and immersed the arm for a few minutes, then dried it, and worked away at the hand for a minute or two, and gradually a reasonable vein began to appear. He then inserted a large McGregor needle with a poly-

thene cannula right up to the hilt. All the time he chatted on about the tricks of how to do difficult cannulations: he showed me how to secure it so that nothing, nothing, would dislodge it, and once he was satisfied that the drip was running well, he was gone. To me, it was sensational that someone so senior should have taken the time and trouble to help with something as menial as putting up a drip. I have never forgotten that episode, and I was very grateful for that lesson. I reminded him of this incident, when he was guest speaker at our 30-year reunion 5 years ago: he had no recollection of it.

In the spring of 1958, I attended a short course of lec-



*Student Anaesthetic Form by Alexander Ogston, 1921*

tures on anaesthetics from Dr. Bruce Wilson, who had been President of this Society the year before. He was the first person I heard making a parallel between giving an anaesthetic and flying a plane. He had his pilot's licence, and he had served in the RAF, so he knew. Two months later, he was dead, the result of a severe attack of asthma.

Anaesthetics was not taken very seriously by students in those days, and the only thing that focused our minds at all, was the knowledge that we each had to give ten anaesthetics under supervision and produce written confirmation of having done so, I can't find my record



*Dr. Alexander Ogston*



card, nor the certificate stating I had given the anaesthetics, but I do have my Father's. When he died, we found this certificate among his papers, and I wished I had known of its existence when he was alive. As you see, he is stated as having given 200 anaesthetics, hard to believe, and it is signed in 1921 by Alexander Ogston, the senior anaesthetist in Aberdeen, one of the Original Members of this Society, and its President in 1927. Here is the lovely photograph of him, from the 1989 Annals, with his Shipway's apparatus, perhaps the machine my father was taught on.

Anyway, in my time, we had to give ten anaesthetics. So, armed with an empty record-card, we went off to get the necessary signatures, as fast and as deviously as possible. Dr. John Latham was considered the best laugh, and I joined him for a casualty session at Woolmanhill. All the anaesthetics were inhalational, and it was indeed a hilarious, if not hairy, experience. All I did was hold the mask, while he juggled the controls. With each patient developing frightening obstruction, often with alarming retching, Dr. Latham became more and more jovial at the challenges presented to him, showing not the least sign of anxiety. It seemed to me that administering an anaesthetic was just as terrifying as being given one, but he was the first to show me how to keep a clear airway in the unconscious patient by holding up the chin. It clearly required a strong hand, and, more importantly, an ability to tell hysterical stories the entire time.



*Dr. John Latham*

The other anaesthetist I joined was Dr. Lawson Davidson, for a surgical list in Foresterhill. This was a much calmer scenario, and there was time for me to be allowed to inject 5% Pentothal, (in the antecubital fossa), and then hold the mask, and twiddle the knobs. One patient developed acute bronchospasm, and I witnessed the use of adrenaline for the first time. I am very grateful to both these anaesthetists for not letting me feel a nuisance, as I know now what a hindrance students can be, no matter how stimulating they are. These sessions merely strengthened my resolve that I would never, well almost never, be an anaesthetist.

My first house job was at Woodend Hospital in Aberdeen with Dr. Bill Gauld. He was one of the old



*Dr. Lawson Davidson*

style physicians, gentlemanly, caring, and considerate to patients and staff alike. In those days we did alternate 24-hour receiving, hard work, but excellent experience. Dr. Gauld was the first to give me and my co-resident Bob Downie, real responsibility. We began to treat most problems on our own, and he allowed us to develop the self-confidence which can never come as a student. He laid down one stipulation. He said 'If you make a mistake, and do something stupid, you must come and tell me about it promptly and truthfully, and I will support you, and if necessary defend you all the way (he meant to the House of Lords, I think). If you don't tell me and if things go badly wrong, you may well be on your own.' He was a marvellous man to work for. Here is a photograph I took during that six-months, showing the standard Christmas Day ritual, which in those days, took place in every ward in the country. There is Dr. Gauld carving the turkey in the entrance to Ward 6, with his wife and small son, Rannie, Sister Howitt, Bob Downie, and one of the Staff Nurses. All Chiefs went



*Dr. W.R. Gauld Carving Turkey, 1960*



into their Wards on Christmas morning, many of them with their wives and children. They were entertained to sandwiches, shortbread, cake, and several large schooners of sherry, before carving the turkey for the patients, who would have been entirely justified at being thoroughly concerned at the thought that they might perhaps require some urgent care and attention from these flushed and inebriated members of staff. Changed days now! On the 12th of December last year, all members of staff of the Victoria Infirmary Trust in Glasgow, received a circular from the Director of Human Resources, which read: 'At this time of year, it is appropriate to remind all members of staff that the possession or the consumption of alcohol on Hospital Trust premises is in contravention of Trust regulations, and is *strictly forbidden*. The opportunity is taken to wish every member of staff an enjoyable Festive Season.'

My next job was in Inverness, one of the best times of my life, with some of the best mess parties on record, and in the company of some of the most fetching co-residents imaginable (the female ones, that is). I was house-surgeon at the Royal Northern Infirmary, to Mr. Arthur Hamilton, who had been Surgical Tutor in Edinburgh. He was an excellent all-round surgeon, who ran a highly-organised unit at the RNI. He was the first person to take an interest in what I planned as a career, and I'm grateful to him for his encouragement. He won't mind me telling a story, which he told against himself, because it could happen to any of us! He was meticulous in his early morning routine: his alarm would go at 7.00 am, he would be shaving at 7.10, sitting on the throne at 7.15, splashing in his bath at 7.20, and would leave the bathroom at 7.25. He grumbled that this routine was being regularly interrupted by telephone calls, when he would have to leave the bathroom to take the call in the bedroom across the landing. One morning, at coffee-time, he told us that a telephone was being installed in his bathroom that morning, and that this would put an end to these annoying intrusions. So, next morning, at coffee-time, we dutifully asked if the new telephone was working OK. He looked a bit sheepish, and said yes, it was working all right. He had been sitting on the throne that morning at 7.18, and the phone had given its inaugural ring. He had picked it up triumphantly, 'Morning, Hamilton here', and a small voice at the other end said 'Oh, eh, could I speak to Mrs. Hamilton, please?'

Dr. John Bolster, was the senior anaesthetist in Inverness, and he anaesthetised for one of Mr. Hamilton's lists. He was a friendly man with an ebullient personality, and he was to become President of this Society in 1966. He was very nice to residents, and was always very happy to let us do his premeds for him.

The anaesthetist who had a lasting influence on me was Dr. Norman McLeod, the last Senior Registrar anaesthetist to be appointed to Inverness in the old days, until the recent rotation with Aberdeen was established. Dr.

McLeod anaesthetised for Ham's other list, and not only did he see all his patients the day before, he took time to explain to me the reasons why he chose certain premeds, and why anaesthetic techniques had to be altered to resolve co-existing medical conditions. I was astonished at his knowledge of physiology and pharmacology, and his ability to discuss complex medical problems with physicians, with whom he could clearly hold his own. (John Munro at Yorkhill was equally knowledgeable in his discussions with paediatricians). Dr. McLeod was confirmation for me that anaesthetists were entirely the equal of other specialists, and for the first time, the idea was implanted that anaesthesia might prove a fascinating career.

When he left Inverness to take up a consultant post at Perth and Bridge of Earn, I followed him down, and became SHO anaesthetist at Bridge of Earn Hospital, probably one of the most isolated posts in anaesthesia: I didn't even rotate to Perth, which was only three miles away. The early training I received could not have been better. There were two older consultants, Dr. Lawrie and Dr. Millers, and two younger ones, Dr. Davie and Dr. McLeod, so I received a balanced training of old and new ideas. I was put on receiving duty after only five weeks, and then for a year and a month, I was on call alternate nights. I picked up technical skills rapidly, because there was so much to do, and I have often recalled my good luck at starting in a District hospital. I had discovered something I really enjoyed, and was reasonably good at, (i.e., I hadn't actually killed anyone), and I wanted to get my Fellowship.

It is hard for trainees to believe that the old Primary FFA included Pathology and Anatomy, as well as Pharmacology and Physiology, and all four subjects had equal weight in the exam. Physiology was the weak link in my chances, and I decided that the best way to learn Physiology would be to teach it, so I spent a year as Demonstrator in Physiology at St. Andrews. The Physiology department was upstairs in the lovely Bute Medical Building, down the hill from St. Mary's college, under the arch off South Street. Professor Antony Ritchie was Professor of Physiology, an austere man, who was seldom there, being on so many national committees. Downstairs in the Bute was the Anatomy Department, of which the Professor was Robert Walmsley. He had trained in Edinburgh with Jamieson, and had written textbooks of Surgical Anatomy with John Bruce and Ian Aird. I arranged an appointment to see him to ask if he would allow me to attend some anatomy lectures, when I wasn't required upstairs. I had never met him, and was in some trepidation of the interview, as he might think my request an intrusion. I needn't have worried. He could not have been more charming or supportive, saying 'yes, yes, Dr. Macdonald, yes, we will be very delighted to have you with us any time, and I will let Dr. Smith, my Senior Lecturer, know that you may be attending his lectures too'. He asked about my background, and my future plans. When I got up to leave, he walked to the door with me, and then, almost

as an afterthought, he said 'and do you fish, Dr. Macdonald?'. This question came across as the final arbiter of my true worth and character, a sort of pass-fail question in the Part 3 orals. I failed it badly, having to admit that, sadly, I was not a fisher. I decided it would be unwise to try to make up for this personal deficiency by saying I had two rather daft, if not deranged, uncles up North, who conversed animatedly with the fish they were trying to catch.

Professor Walmesley was tall, slim, and elegant, and he had a slow delivery as a lecturer. In his lectures he always emphasised the BIG points, 'which you MUST remember, and everything else finds its place'. He finished every lecture by re-emphasising the BIG points. He had two phrases which were characteristic of him. When giving something extra significance, he would say: 'and I say to you, YES, Ladies and Gentlemen, YES, this mesoderm will indeed give rise to the third branchial arch'.

His other expression came at the end of each lecture when he would intimate what had to be prepared before the next. He had the habit of emphasising this by waving his right hand in the air, with two, or sometimes three, fingers in this slightly risky manner. He would say 'now, before the next lecture, Ladies and Gentlemen, you must all get up the course of the sciatic nerve:' or, 'the intercostal space'. One day he said 'now, Ladies and Gentlemen, before the next lecture you must all get up the female reproductive system'. There was rapturous applause from all the male students, and he gave a very good impression of not quite understanding what the rumpus was all about.

His Senior Lecturer, Dr. Jim Smith, was a legend in anatomy lecturing. A tall gaunt chain-smoker, he had a slight burr in his speech. He would stride into the room, and for an hour would captivate his class, building up on an empty blackboard a three-dimensional picture of his subject. He did all the head and neck anatomy, so that, for example, he would start by drawing the outline of the sphenoid, then add in the muscles in brown, the ligaments in green. Then the arteries, veins and nerves in red, blue and yellow, and before your eyes, there emerged, in three dimensions, a picture that compared to one of Jamieson's Plates, or a page from Gray's Anatomy. All this time, he would be explaining the relationship of one structure to another, using black chalk to show clearly which structure was anterior to another. For me, it opened up the mysteries of such dark crevices as the pterygo-maxillary fissure and the pterygo-palatine fossa. It was a remarkable experience to witness such inspired artistry and lecturing, and, for a young anaesthetist, it gave a concept of head and neck, which could never be gained from books, or at the dissecting table, and I was delighted to learn that he was given a personal chair in his later years.

During that year in St. Andrews, I discovered one Saturday that there was an anaesthetic meeting taking

place in the town, I had no idea what it was, only that it was in the Atholl Hotel. I decided to go along and gate-crash. I eventually found the meeting, and slipped in to the back row, and I heard the last ten minutes of what was apparently a Presidential Address by someone called Forrester, and then a Guest Lecture by a Professor Edgar Pask, which included an extraordinary film showing himself anaesthetised and intubated under deep ether, being flung into a swimming-pool, simulating rough seas, to test the safety of lifejackets: an absolutely heroic venture, though it did seem to me a far cry from anaesthesia: in fact, for a while, I wondered if I was in the wrong meeting. I also heard an announcement that the golf competition had resulted in a tie between a Dr. Baird and a Dr. Dangerfield. Neither name meant anything to me then, but ah ken noo. I had of course unwittingly stumbled into the Annual Meeting of the Scottish Society of Anaesthetists.

At the interval, I went and stole a cup of tea from the trolley, and was trying to keep a low profile, when I felt a firm hand on my elbow, and a voice saying, 'and who might you be?' I realised my cover had been blown, and I expected to be frogmarched out to the road. However, it was a kindly face, full of interest as to who I was, where I had come from, what stage of training I was at, and what plans I had. This was Dr. Calum Shaw, acting as a good College Tutor, as well as Secretary of the Society, and Editor of the Newsletter. He was not at all concerned that I had gate-crashed the meeting, though he did just happen to have a membership form in his pocket. He had seen this strange face in the crowd, and had sought it out. I am grateful to Dr. Shaw for speaking to me that day, for as well as being thoroughly supportive, he was instrumental in introducing me to Dr. Willie Shearer of Dundee, so that when the time came, I would have a contact in a bigger department. Calum Shaw must have helped many, many trainees in those early days. He was meticulous in everything he did, his anaesthetics were models of precision, and his recordsheets, and his accurate and extensive Minutes of the Scottish Society Meetings during his years as Secretary, epitomised the man. Two different colours of ink, a ruler, a stop-watch, and a Mayo stand to write on, were as important as the impeccable anaesthetics he gave.



*Dr. and Mrs. Shearer at his retreat in 1972*



Four months later, I was indeed in Dundee Royal Infirmary, picking up again the threads of clinical anaesthesia. Dr. Willie Shearer was one of the most lovable and popular chiefs I ever worked for, totally dedicated to his work. He could also be the most exasperating person on earth, for he was determined to run the comprehensive and ever-expanding anaesthetic service with as few staff as possible. He regarded it as his mission in life to keep costs down, seeming to think that somehow it might be an indication of personal failure should he ever have to request more staff. As a result, we ran about DRI like headless chickens, and we drove between the different hospitals like Jehu, trying to ensure that all the commitments were covered. We were constantly being redeployed, often at 11 o'clock at night, and regularly sacrificing time off to help out. But we would all have done anything for him: we could hardly refuse, because he worked harder than anyone, and always gave himself extra duties before anyone else: it was unashamed blackmail. Just occasionally, there would be a lull between crises, and if we were caught sitting in the department having a coffee, he would storm in, in his theatre clothes, and shout 'Ye see, there ye are, you've nothing to do. That's what I mean, we've got too many staff', and storm out again.

He took a particular delight every year, extracting figures from the theatre books, counting up the anaesthetics given by every member of the department, and he took a mischievous pleasure in posting these figures on the wall, and every year it showed that he himself had given far more than anyone else, well over 2000, I seem to remember, and twice as much as the next person. This was the annual low-point for the senior registrars, as they were invariably bottom of the list with very low totals, because they did all the long major cases. Dr. Shearer was top, because he did childrens' lists in both eyes and ENT, and these built up his numbers. He was a wonderful anaesthetist, an infectious teacher, and a magician with children for tonsillectomy. He taught me ethyl chloride and ether inductions with the Schimmelbusch mask, always demonstrating to the child very convincingly, just exactly how it was to be done. When I went back to Dundee as a Senior Registrar, I never quite had the courage to revert to those techniques again, and it is hard to believe I ever did it. It was always instructive and fun to be with him: he laid the greatest emphasis on watching the bag; feeling the pulse was less important, and taking the blood pressure was sometimes a dangerous distraction.

Dr. Shearer was a character, and there are many anecdotes about him. In the early sixties, he drove a very elderly Standard Ensign. It showed many battle injuries, and had incipient multiorgan failure. More worrying still was that if you were a front seat passenger, your door was only kept closed by a bit of string going across your lap and tied to the driver's door, after you were both in: Dr. Shearer said it was like having a safety belt on. He would regularly chauffeur a car-load of us to meetings in Edinburgh or Stracathro, and there was always an embarrassing rush to get in the back seat. As

the most junior SHO, the front seat seemed always to be reserved for me. It was rumoured that Dr. Shearer was partly colour-blind, and that when approaching traffic-lights, he gauged whether they were at red or green by the behaviour of his front seat passenger. This placed a worrying responsibility on me. If conversation continued normally, he could assume that they were at green, but if conversation faltered and if he detected his front seat passenger pushing his legs through the floor, he would stop, sometimes quite abruptly. This uncertainty in our minds was never really resolved, he never actually gave us any cause for concern, and he had probably started the rumour himself, just to keep us alert. It was my good luck that a few weeks after arriving in Dundee, the Registrar's Meeting of the Scottish Society of Anaesthetists was to be held there. Some of you may have attended that Meeting, and others may have heard this story before. There was considerable anxiety about the various demonstrations that were planned. As the most recent acquisition, and therefore the most expendable, I found myself being volunteered by the other juniors to what was clearly regarded as the most risky mission, which was to assist Dr. Shearer in his demonstration of explosions. I suspected that this was the devious Dundee way of getting rid of a junior who was already showing himself not quite up to the mark. Another junior, May McBride, a gentle sweet natured registrar, who had never done anyone any harm, was also allocated to this kami-kasi task-force, and with no preliminary groundwork, we set off. This demonstration was to take place at Ashludie Hospital, a lovely old mansion-house in beautiful grounds, where all thoracic surgery took place. May McBride was stationed in this theatre, with a Boyles machine, and her job was to fill small polybags with varying mixtures of  $O_2$  or Air, with either cyclopropane or ether, and some of these would also have  $CO_2$  or  $N_2O$  added. She handed them through the window to me, and here is the view from the window. I had to run across the grass to where 30-40 registrars were assembled in a clearing in the bushes. My hapless job was to attach these Semtex polybags to two terminals on a battery circuit. Dr. Shearer was working the ignition switch to produce the bang, all very exciting stuff. However, he was so preoccupied with talking



*Mrs and Alex Forrester in 1995*

to his audience, that he kept twiddling the switch just as I was fixing the bags, so that several of them went off in my hands, much to the delight of the audience. Now,



whether this was by accident or by design, I never really knew, but as I got to know Dr. Shearer better, I suspected it was all part of the planned entertainment. It was an enormously successful and popular demonstration, and it illustrated very convincingly how explosive these agents were in oxygen, but not in air. I was especially grateful to Dr. Shearer for involving me in this escapade, because it sparked an interest in fires and explosions that I never lost.

I moved to Glasgow Royal Infirmary as Registrar. Dr. Alex Forrester was Head of Department, and he had around him a very strong team of progressive heavyweights, which had made his department one of the foremost in the country. Dr. Forrester, was quite unassuming, but was the ideal chief, having an ability in his quiet manner to get his way with those who had a much higher profile. He was almost entirely an administrator by the time I went to the Royal, but he worked extremely hard. He took a personal interest in everyone in the Department, and was, and still is, one of the most respected and admired colleagues of our time. Everyone who knows him has an immense affection for him. His main achievement was to build up such an impressive academic department, and I recall very clearly his excitement when the Department was officially redesignated the 'University Department of Anaesthesia'. He was so excited about it, I thought he was going to break his famous biro, but no, it just clicked up into a higher gear. He had many other achievements. He devised a tracheal connector which dispensed with the need for a catheter mount, and it had side clips, which allowed it to be securely fixed to a head harness, so that no tapes or ties were necessary. It was used exclusively in the Royal when I was there in 1963-64, and, it could still be used today.

Dr. Forrester's other invention was his throat spray, a steel nozzle version of the Macintosh. It is still the only efficient spray available. It is a crucial part of my technique for tubeless (non-intubated) anaesthesia for laser surgery in the airway, and allows one to keep patients breathing spontaneously on an intravenous propofol infusion, and is a helpful adjunct to IPPV with the cuirass ventilator. I use it on every list, and it is the secret weapon for providing smooth, (well, occasional-ly smooth, anaesthesia.

I once played in a golf outing with Dr. Forrester and two others at Glasgow Gailes. I remember being very worried that I would let the side down by playing really badly, as I hadn't played for months. I needn't have worried. Dr. Forrester must have been the world's most enthusiastic golfer, but many years of practice, endless lessons, and innumerable sets of new clubs, had not left their mark, and the bonnie purple heather of Glasgow Gailes gobbled up a few pocketfuls of Professorial Penfolds that lovely afternoon.

Walter Norris was one of the many big personalities of that department, and all of the others are here today. He was an allrounder, and an inspiring example to any trainee. He was quick to check you if you did something



*Walter Norris*

silly, but quicker still to give credit when you did well. He was to me the ideal anaesthetist, an able clinician, a motivating teacher, a researcher and author with a national reputation, and a tireless supporter of anyone who showed a willingness to learn and improve. He was particularly kind to me during my first few weeks as a rather insecure new registrar, in the big city of Glasgow. Shortly after I started, I learned that he had become ill while on holiday on the Black Isle, and when I was up in Nairn the following weekend, I went to see him in the Royal Northern Infirmary in Inverness, my old hunting ground. I was shattered to see this enormously gifted anaesthetist and devoted family man lying flat in bed, having suffered a cerebellar artery thrombosis. He could not raise his head off the pillow, and was unwilling to move at all because of nausea and vertigo. It was typical of him, that even in those worrying circumstances, he said: 'if only I could keep my head as still as this on the first tee'. Some years earlier, he had been ill with myocarditis, and ten years later, at the age of 49, he died after surgery for an acoustic neuroma. He is still very much missed, but fondly remembered by everyone. I owe him a deep debt of gratitude for his unstinting encouragement to me and to my family over many years.

He took me as his guest to the Annual Dinner of the Royal Infirmary Golf Club, held in a packed Board Room. Speeches are always required of the winners of the Denham Cup, and I heard Dr. Peter Mackenzie and Dr. Bill Manderson present quite uproarious speeches, and I still recount some of their stories.

Walter also took me to my first Association of Anaesthetists Meeting in 1964, at the Russell Hotel in



London. There was a large Royal Infirmary contingent on the sleeper down, and it was my first experience of the bad company you fall into in the Night-cap Bar. It was the first time I found myself being included in the term Glaswegian. The Association Meeting was the biggest I had yet attended, and I was excited by the big names who were to present papers. One of these was Professor Mike Laver of Boston, who gave an excellent paper on the benefits of using PEEP during IPPV, and as soon as he had finished, Dr. John Severinghaus stood up, all 6' 5" of him, and, in his slow drawl, said: 'not all of us concur with Professor Laver in his views on Positive End Expiratory Pressure, PEEP: some of us prefer to call it Continuous Raised Airway Pressure, the abbreviation of which is more in line with our general view of his concept'.

After two years back in Dundee as SR, I returned to Glasgow to join Dr. Gordon McDowall in his new University Department at the Western Infirmary. This was my last job before consultancy, a sort of finishing school. The Founder Members of that Department were Bill Fitch, and Geoffrey Clark. Gordon McDowall was one of the best brains in anaesthesia, brim full of ideas, full of boundless energy, and a great motivator of research projects. I learned from him every day. One lesson I learnt was not to leave to tomorrow what could be done today, or in other words, clear your desk-top before going home each evening. He taught me how no problem was insoluble. There was always someone somewhere who would know the solution: you just picked up the phone and tracked him down, no matter how senior or eminent he was, and you sorted it out there and then. It was a terrific lesson to learn. He was always very supportive of his staff, but he expected 100% from everyone.

He cajoled me into presenting a paper to an ARS Meeting in Oxford, a particularly stressful occasion for most people, but for me it was like being thrown to the lions. I only just survived, but I still groan when I remember freezing at a simple question from Jim Freeman. I have since taken car-loads of trainees to ARS meetings all over the country. It is always compelling viewing at these Meetings to watch the young stags locking horns with the old monarchs. For my part, I was glad I had been there and done it: I felt I had won my school colours for courage.

That post at the Western was the last job before becoming consultant. But, of course, you don't stop training or learning just because you're no longer in a training grade, that's what CME is all about. I would like to just mention three very senior colleagues who were a particular help to me, and taught me much, during my consultant years: Professor Jimmy Robertson was an examiner in the Final FFA, when I joined in 1980. He was a tremendous help and friend throughout my examining years.

Dr. Tom Boulton, was also a great support during those examining years, and more recently, he has given me very sound advice in my efforts to compile the history of fires and explosions.

And finally, Dr. Kenneth Grigor, our Chief at the Victoria Infirmary in Glasgow for many years, has been a continuing inspiration to so many of us, by his determination and sheer hard work and example, enabling the Victoria Infirmary to become one of the best training schools in the country.

I have mentioned a number of old chiefs who, in different ways inspired me in my early days. They all played an important role in supporting and encouraging me, and many others, during our careers. Trainees at the moment are having a rough time, and must feel frustrated, at the widespread changes which are taking place in medicine, and particularly in anaesthesia. The trainee of today needs a resilient strength of character, a tough sense of direction, and a real hunger, in order to succeed. That hunger needs to be fed by unsparing encouragement from senior colleagues and teachers. There is nothing very glamorous about training junior anaesthetists or students at the grass roots in theatre: it is time-consuming, and it is stressful because we are already so stretched ourselves, but there is nothing more rewarding than a trainee, or a student, saying to you at the end of a long day, 'thank you very much, it's been terrific, I've really learned a lot'.

We must all play our part. We mustn't assume that someone else is asking them about their anxieties, or the crucial questions about their futures. The College Tutors cannot do it all. We can all have the juniors round to our homes for an evening, and a new baby arriving eight days before, is no excuse for not coming. We can take them on golf outings, even though they will usually walk off with the Trophy. We can encourage them to attend meetings, and look after them when they do come.

Who knows when a ten-minute discussion during theatre, or over coffee, may be the crucial spark to ignite a career, or perhaps save someone from despair. This day-to-day concern for our trainees is by far the most important way that members of the Scottish Society of Anaesthetists can fulfil the stated aim in the Original Constitution, to 'promote the teaching thereof'. We all need to make a personal commitment to the next generation, so that they can in due course bring even more esteem and prosperity to the specialty, and push it higher up the peg-board of the medical profession.

Walter Hagen was one of the greatest American golfers of all time. He won four Opens, two American Opens, and five PGA Championships. He was also a great character, with a wonderful attitude to life. In his twilight years, he said 'I never wanted to be a millionaire. I just wanted to live like one. You're only here for a short time. Be sure to smell the flowers along the way'

My message is: 'Smell the flowers along the way, but don't forget to tend the buds as you go'.

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# SURGERY APPROACHING THE MILLENNIUM

PROFESSOR SIR DAVID C. CARTER



We are approaching the millennium, it's a very good punctuation mark, and I share a lot of thoughts in common with your President - we are in very difficult times right now. We seem to spend a lot of time away from the clinical coal face. I thought I would look at surgery approaching the millennium. I would like to reassure you, because I know you are worried - what sort of message is he going to give us because if he goes, we go - reports of the death of surgery have been greatly exaggerated.

I thought I would consider one or two things. First of all - will there be a surgical workload? I have already answered that - of course there will be. Perhaps more importantly - how is surgery changing, how will it change. Thirdly I wish to consider the issue of specialisation because I know it concerns you just as much as us, and I thought I would spend a little bit of time considering the implications of the greater public awareness and political awareness of what we do, and the results we achieve. There's no doubt in my mind that we are not just in an age where audit is laudable and takes place on the part of the profession, but there is a lot of interest out there in what we do, not just on the part of management, but on the part of the public. I think most people reading this would subscribe to the feeling of openness, but it is a process I think one has to deal with very carefully. Then finally I thought I would consider who is actually going to undertake the work as we go into the next millennium.

Just to get me started - a view of Glasgow Royal Infirmary at the end of the last century and Sir William McEwan operating in Glasgow Royal Infirmary. You can see the great man - that's him there with the beard. I'm not sure which is the anaesthetist. I would imagine there was an anaesthetist, but nobody is where anaesthetists usually are - in other words, not there at all and over here somewhere! The sisters are there and look really quite ferocious, people to reckon with! The sur-

geons are not wearing masks, we assume they've washed their hands, but as anaesthetists running intensive care units you'll know that's a very very doubtful assumption indeed.

This is McEwan going into the brave new world. It must have been a very exciting time - anaesthesia really was here, it became apparent that people were going to be able to do surgery in body cavities, the like of which they had never been able to do before. Lister had been in Edinburgh and Glasgow, back to Edinburgh and gone, but the work he had done there meant that you could embark on this sort of surgery with some prospect of avoiding the problems of sepsis that had so ruined the issue before. Moving further up in the century - about halfway through the 1930s on the steps of the Royal Infirmary in Edinburgh. Sir John Fraser, my predecessor in the present Chair, my predecessor bar four was there. He is joined by his staff, his senior and junior medical staff and his students. It's really quite interesting just to consider this for a minute. Fraser looks really quite composed, very satisfied, master of all he surveys. The anaesthetists were not parking their cars all over the front door of the Royal Infirmary in those days! Interestingly, Walter Mercer, subsequently, Sir Walter Mercer, knighted for his services to orthopaedic surgery, was there but he was the sub-chief. He looks quite an elderly man in those days. Charles Falconer was also there. The young John Bruce, who was an assistant surgeon in those days was there, and I don't know whether we're going to lurch back toward that time, but there is no doubt the surgeons we are going to generate into consultant posts over the next 5-10 years, are not going to be anything like as qualified as the surgeons we have been producing up until recently. There is no doubt in those days you had to spend a long time grinding your way up the pyramid before you got to sit in the middle chair!

So it was an interesting start to this particular century, but as you're all well aware a number of dramatic forces have moved across the surgical firmament and a number of things we used to take for granted have now disappeared from the surgeon's armamentarium. In my surgical youth, you could not go to a surgical meeting without at least 40-60% of the programme in some cases being given over to the surgery of peptic ulcer. We all know what's happened to that, the key article 1972 - James Black, a St. Andrew's graduate I am pleased to say. The Definition and Antagonism of Histamine H2 receptors. We know not only has that happened, but we now recognise that *H. pylori* has been there all along and we now have the ability, not only to knock out acid secretion but we have the ability to knock out this fellow as well. So, as anaesthetists, you're already well aware of what's happened to peptic ulcer surgery. Data from the Western General Hospital in Edinburgh shows surgery for peptic ulcer actually peaked in 1977. Parietal cell vagotomy was the operation of the day, but with the introduction of the H2 receptor antagonists into clinical practice, by 1987 peptic ulcer surgery was beginning to decline at an alarming rate.



In Edinburgh the surgical community meet every Saturday during term and each unit takes it in turn to present their data and their deaths for the last year. Though it's been very salutary over the last few years, the amount of peptic ulcer surgery being done in Lothian electively, has been in low single figures. It has virtually disappeared from the map. But you're also I think, as anaesthetists, aware that the problem has not gone away. It's a very startling, stark, statistic that the mortality from peptic ulcer in the United Kingdom has not fallen since the advent of H2 receptor antagonists. You just have to look through our audit statistics of the Scottish Mortality Study to see that the problem has not gone away. The number of deaths from peptic ulcer is static. It's not young people dying, it's not people dying from complications of elective surgery, it's older people running into trouble with bleeding from peptic ulcer and from perforation as well. So, if you like, here's a trend, a dramatic trend, where a lot of work has gone away from surgery but the problem has not gone away. We are now faced with the situation that when you do have to operate on a patient in extremis, we're expecting a generation of surgeons to take on that surgery who have not had the background and the experience their predecessors had as far as elective ulcer surgery is concerned.

There was a time in the 1970s when it looked like surgery for gallstones was going to go out of business. Lithotripsy was in, it was proven to be of benefit in renal stones, it looked as though oral dissolution therapy with bile acids was also going to come in and very seriously people were standing up saying - the era of surgery is now dead. But I think it's become very apparent to everyone that lithotripsy is not as effective in this disease as it is in renal calculi. It's also apparent that you might be able to dissolve these gall stones by a lot of effort over a year or two of dissolution therapy, but the problem has not gone away and the patient is liable to develop gall stones again and run into problems. The thing that has really transformed all this at the same time, is the advent of laparoscopic surgery.

I don't have to preach to this audience. You've all sat at the other end of the table watching your surgical colleagues claw their way up the learning curve, but this has been a dramatic revolution that no-one could have foreseen. One day we'd be doing gall bladder surgery by open cholecystectomy and within one or two years that would be out of the window and replaced now by what is the standard technique of laparoscopic cholecystectomy. I think it's important that we should put this in perspective. The mortality for open cholecystectomy in Lothian over the 10 years before laparoscopic cholecystectomy came in consistently beneath 1% and that includes emergency as well as elective gall bladder surgery. There's no doubt that if you get out of hospital much more quickly you can probably get back to work more quickly after this procedure, but there is no doubt in my mind that we have incurred a lot of serious problems with the rapid introduction of this technology, with a lot of people having to get up to speed very very quickly, as far as laparoscopic surgery is concerned. You don't need to see many people with problems resulting from this to give you a lot of pause for thought about all forms of biliary surgery but in particular the sudden rush for the laparoscopic revolution. As an example, consider a woman referred to us. She had

gone into the hospital elsewhere, as you know it's always somebody else's hospital where these things happen, for elective gall bladder surgery. She had her gall bladder taken out and her common bile duct divided in the process. She still had a biliary fistula, she was grossly undernourished, she had been septic, she was requiring parenteral nutrition and she was yet to have her third major operation to try and sort out the problem. It really is a catastrophe. There was a time when if this happened to a patient - most patients I used to see referred to us with biliary strictures accepted that this was the luck of the draw. It was unfortunate, they'd had a stricture. That is now no longer the case. I would say, without exception, in the last three or four years, patients we have seen with bile duct strictures which are iatrogenic, medical legal action has been in the pipeline. I would have to say to you that I think these people are right, because in most cases this is not the result of difficult surgery undertaken under very adverse circumstances. In most cases this is surgery undertaken in young, slim, female patients. This is the standard patient to have a bile duct injury and it's a mistake in recognition of the anatomy which is really responsible.

Just to put this into perspective take the Swedish experience. In one year in Sweden they collected all their bile duct damage together. There were 65 cases in one particular year. Looking at the experience of the surgeon who was operating at the time the bile duct was damaged, when the surgeon is on first 25 bile duct operations, they very rarely damage the bile duct. They're careful. The major incidence of injury happens where the surgeon is between 25 and 100 operations and that is the dangerous part of the learning curve, where they think they've surmounted the slope. Surgeons who are more experienced, who've done 100-500 cholecystectomies, relatively rarely injure the bile duct, and you can speculate about this - it's interesting. Surgeons who've done more than 500 bile duct operations didn't damage any bile ducts in this particular series. That may mean one or two things of course. It may mean you get very good after a while, or it may mean you stop working altogether!

I think what I would like to put across is that laparoscopic surgery is here to stay. I think it has been a remarkable revolution. I think like us, you've watched with some apprehension while people got up to speed as far as laparoscopic cholecystectomy is concerned. I read in the Scottish Press, I read the Chief Medical Officer, I read my friend Alfred in Dundee, telling me that 70% of the abdominal surgery we do now, in the future will be done by laparoscopic, minimally invasive, means. I don't think that's right. I think like most things in medicine and surgery, we've gone through the phase of enthusiasm where people have embraced the new technology and have written articles in the press saying - I did this by laparoscopic means, aren't I very clever, but I think we're now going through the phase of reappraisal.

There's no doubt in my mind that laparoscopic cholecystectomy is here to stay. I suspect that laparoscopic hernia repair might retain a place but I wouldn't put it any more strongly than that. I suspect that laparoscopy on receiving nights for young women with low abdominal pain that might be appendicitis - yes we might have

laparoscopic evaluation and appendectomy in that context. But I doubt very much whether we'll be doing a lot of laparoscopic colectomies as we go into the next millennium. It's already becoming clear that you can mobilise the colon very nicely through the laparoscope but when you try and pull it out through that small opening. It goes against all the teachings, all the tenets, of cancer surgery, that you mobilise something and you then squeeze it out through a tiny opening and in doing so you disseminate malignancy. That has already been reported. People who've undergone a potentially curative colonic resection have come back with seedlings in the wound that have been put there at the time the specimen was removed. In my own area of interest, people are now reporting the Whipple operation done by minimally invasive technology. As you know it takes you 4-6 hours to do a Whipple operation anyway. Done by laparoscopic means, it's taking something like 12-15 hours to do a Whipple operation, and to me it flies in the face of common sense that one is going to do this simply to be able to demonstrate that you can do it by minimal invasive means unless there's some very significant benefit to be accrued.

If you want my guess, as we go to the millennium, laparoscopic surgery is certainly going to be here to stay and there's going to be well defined indications for it, and hopefully in future it's going to be done only by people who really have got up the learning curve in a proper measured way. It's not going to wipe away open surgery in the way some people would have us believe.

At this point there is an interesting paradox which I see. When I was a medical student, we were taught that there were two types of jaundice - medical jaundice and surgical jaundice. Medical jaundice by and large was people with liver disease, alcoholic cirrhosis, primary biliary cirrhosis and the like. Surgical jaundice was people with stones in the common bile duct and people with cancer of the pancreas you were going to have to operate on to bypass the obstruction. If you think about it, that's now turned around. Someone who has stones in the lower end of his common bile duct and in the past we would have operated on - he's already lost his gall bladder, he's jaundiced at present because he's got residual stones in the bile duct, but he doesn't now need an operation. Nowadays we would take that patient's stone away by endoscopic papillotomy and stone retrieval.

To continue with the theme, the first patient I ever saw in Glasgow Royal Infirmary with portal hypertension didn't have a self-inflicted wound, never drank alcohol but in fact had primary biliary cirrhosis. In the old days, we would regard her as having medical jaundice. Nowadays of course that's changed, in that what we would be offering this patient today is not just studied medical treatment over many years while her natural history of disease declared itself, but the surgical option available to this lady nowadays in the form of liver transplantation.

Let me just digress about this. It seemed to me very important that Scotland had a Liver Transplant Unit. We started pressing for this in 1985-1986, trying to put pressure on at St. Andrew's House to look at the question - should Scotland have its own Liver Transplant

Unit. There was a very strong school of thought that said it probably was not necessary, Scottish patients could do down to Birmingham or King's as they always did. To me that was an anathema. The sums were such when we did them in the mid 1980s, you could demonstrate that you were going to require at least 50 liver transplants in adults per year in Scotland. That's before you get into children, and before you talk about alcoholic cirrhosis. The figure may well be higher than that. It became a point of honour with me that Scotland must have a Liver Transplant Unit, not just because we could do liver transplantation, but because we would retain and then develop the technology that not only enabled us to do liver transplantation, but enabled us to do all the other things that went on behind it.

A political decision was announced in 1991 that there would be a Scottish Liver Transplant Unit. Bids were invited later that year. There were three very good bids from Glasgow, Dundee and Edinburgh. It was a very close run thing, but the unit actually opened in Edinburgh in November 1992. The first fifty retrievals the unit did were mostly in the central belt of Scotland but the team were occasionally flying down to Cork, occasionally down to South Wales and right down into Devon on one occasion. Since 1994 the United Kingdom is now zoned. All the retrievals that are needed in Scotland, we do them, even if the liver may go away from Scotland to King's we will do the retrieval in Scotland. As you might imagine this has greatly simplified the life and the work rate of the people who work with me. There does seem to be a Scotland wide culture of organ donation. We've retrieved 111 livers in the period up to March 1995 but we've only actually done 80 transplants in Scotland. That tells you a very important message. Scotland is a net exporter of organs and the debate about - do we need to go to living related donor work, which you can now do with liver transplantation. We're a long way from that as long as we don't do anything that is going to rock the boat as far as the Scottish public and their perception of liver transplantation is concerned.

It's all very well to talk about retrievals, but how are we actually doing - this more than anything else represents one of the best things about surgery in the experience I have had in Scotland, and that is the feeling of collaboration. I don't just say this because I'm the guest of the Scottish Society of Anaesthetists today, but you couldn't achieve this sort of programme without very close working collaboration of the highest order between surgeons, anaesthetists and physicians, and the back-up that goes along underneath that in terms of nursing and paramedical staff is of paramount importance.

In elective transplantation surgery the current operative mortality is 5% since the programme started and in emergencies, that is fulminant hepatic failure, the mortality is 38%. I don't want to tempt providence for the team, but I think you'd also be interested to know that the Liver Unit has not lost a patient undergoing elective transplantation of the liver in the last two years. I think it is also important that we give just a little bit of thought to the fulminant hepatic failure because one of the major causes of fulminant hepatic failure in our patient population is paracetamol overdose and you well know that that could disappear at a stroke if the



pharmaceutical industry and the government between them were willing to make the necessary modifications to that particular agent.

I do want to come on to what I think is a more controversial part of the programme. I've alluded already to the importance of having a Scottish Unit, to keep that technology, to keep that investment in capital, in resources not only physical but human as well. We're about to go into some very interesting discussions as far as liver transplantation is concerned.

The second patient I ever had in Glasgow Royal Infirmary with portal hypertension had bleeding oesophageal varices. He did have a self-inflicted wound. He'd been drinking as much as he could lay his hands on for as long as he can remember. On his way into the Royal Infirmary he fell coming out of the Manx which used to be opposite. He was a little bit jaundiced and he'd got a kind of weary sardonic grin. When you pulled back the bed clothes he was grossly ascitic and hardly any liver at all. This man had alcohol related cirrhosis. When I was in Glasgow Royal Infirmary, before liver transplantation was really underway, the major cause of cirrhosis in that patient population - 98 of the 138 patients we saw - had alcoholic cirrhosis and the vast majority of them were in the appalling Child C grade, the people with the worst prognosis.

I don't think there's any debate about the indications for liver transplantation in chronic active hepatitis, cryptogenic cirrhosis, primary biliary cirrhosis and the like, but there is a big debate right now about alcohol related cirrhosis. It's a very personal thing. Interestingly, when the medical profession are canvassed as to their views about - do you transplant the alcoholic cirrhotic - the majority of doctors feel that that is inappropriate. I would have to say to you, there is very good evidence that not all these people are on skid row. The Royal College of Psychiatrists came out in the BMJ in about 1985, with recommendations for alcohol consumption. If you are a man you could have 3 pints of beer a day, 6 glasses of wine, 6 glasses of sherry, or 6 nips of whisky. In the East part of Glasgow, the problem was people hadn't recognised this was a choice! We saw a lot of people who were working their way consistently through the entire menu! If you're a woman unfortunately the dice were loaded against you, you could only have half as much. I note the BMA have recently decided that there is no such thing as a safe limit of alcohol consumption. The point I'm trying to make is, not all the people you see with alcoholic cirrhosis are on skid row and you don't need to work terribly hard at the sherry over the years consistently - if you have the constitutional inclination towards cirrhosis of the liver, you can get it by working relatively easily. The other thing I would say to you is that the data will show that reformed alcoholics, totally screened before being put into the programme actually do very well following liver transplantation. I'm not saying all of them stay on the wagon for evermore. The data will tell you that the majority do drink at least to some degree again, but the vast majority of them do not go back to alcohol abuse. I think there's a real issue here. As we go into the later stages of this millennium, as far as liver transplantation is concerned, it's demonstrably a safe and sensible thing to do for defined indications. Should we, or should we

not, be offering this form of surgery to people who have abused alcohol?

The programme in Scotland has begun cautiously to use transplantation in alcoholic cirrhotics, recognising that this has to be done with extreme care. It's unfortunate that one of the individuals was Jim Baxter and the blaze of publicity surrounding it, but there's going to be a very important public debate and one thing we don't want to do is to jeopardise this wonderful pattern of availability of organs, reflecting the willingness of the public in Scotland to contribute to this sort of programme - we must not jeopardise that. I think it's going to be a major source of debate.

I want to turn now to one of the issues I mentioned in the beginning and that is the issue of specialisation - is one hospital going to be very much like another? I just want to draw on one or two examples. Our own particular interest is in acute pancreatitis. The days are gone when we lost people in the first 48 hours with acute pancreatitis from shock. That's now very uncommon. But what we've uncovered is this other problem - we get people through the first and the second week and they languish in our intensive care units on the brink of, or in frank multiple organ failure, and some of them are going to require pancreatic necrosectomy.

This is the problem - gallstones are by far and away the major cause of pancreatitis, being pushed into second place is alcohol. In our practice it's interesting that alcohol figures on a lot of the work patterns that we have at the present time. But this is a patient population that we are seeing at present going through our hospital and at the end of the day there is a mortality of 6% in acute pancreatitis. When you look carefully at the data, in a four year experience in the Royal Infirmary of Edinburgh the patient population is divisible into two types. The lion's share of our workload is the normal spectrum of acute pancreatitis coming in the door, with a mortality rate of 1.9%, but we have a significant population transferred from other centres, more or less all of them requiring intensive care facilities and at the end of the day they have a mortality rate which is 10 times greater, 19%. I think this really epitomises one of the difficulties we have in surgery, between generalisation and specialisation. Should we be centralising all of these patients in the one institution from the word go and hopefully bringing this mortality down. You can argue that that may be laudable but clearly it is not feasible unless we have a major rearrangement of resource.

One of the things that this patient population coming through the Royal Infirmary has enabled us to do, is not only to look at the clinical performance of our work in acute pancreatitis, it's enabled us again, in collaboration with the Anaesthetic Department and colleagues in anaesthesia, to look at the mechanism of multiple organ failure. In particular at the role of interleukin 8 in the development of the adult respiratory distress syndrome, associated with acute pancreatitis. The point I am making is that by centralising this workload we would hope first of all to get the expertise to bear to bring the mortality and morbidity down, but also if an institution like the Royal Infirmary of Edinburgh is going to prosper in this hard nosed competitive age as far as its research standing is concerned, we need this patient population to do this sort of study.

I want to make one or two points about the challenges that are going to face surgery as we go into the millennium as far as the major gastrointestinal cancers are concerned. Cancer of the pancreas is number four or six on the list of killers in most Western countries, depending on the sex of the patient. It has an appalling prognosis - 90% of these people are going to be dead with a year of the diagnosis being made. We now can operate safely on these people if we feel that resection is indicated. At present in our own unit we have a mortality of 1 death in our last 160 major pancreatic resections for cancer. But that's a hollow victory if you're still looking at a 5 year survival prospect. With the 5 year survival figures you're very fortunate if they get above 20%.

I think if you want a challenge to continue in medicine consider cancer. The UK cancer deaths at the last time of asking in 1986 had an enormous impact from cancer of the lung, prostate, stomach, colon, bladder and rectum, with pancreas well down the list. If we are still looking for challenges then we don't have very far to look beyond this list, both in men and in women. I would maintain that when you go down this list, the only thing that can cure any of these cancers, with absolutely very few exceptions, is surgery and that leads me onto surgery of the colon and rectum and the challenge that faces us.

There's no doubt I think that Scotland is one of the cancer capitals of the world and that is certainly true as far as colo-rectal cancer is concerned. I mentioned at the beginning that the surgeons in Lothian have met every Saturday morning since 1946 - we're coming up to 50 years of audit in Lothian. This allows us to know the mortality for cholecystectomy in Lothian for the last 20 years, the mortality for colo-rectal surgery for the last 20 years, and now, more importantly, we can tell the mortality in a given hospital and a given unit, and also in the hands of a given individual. You can see that this is getting into very very tricky country all of a sudden.

A study we've just completed - about to be published in the British Journal of Surgery - recruited every surgeon in Lothian and the Borders who deals with colo-rectal cancer, and all the pathologists. The patient population is elderly but the age range is 20 up to 96, a roughly equal male/female split, and 28 consultant surgeons concerned with this sort of surgery. The range of experience of the surgeons was from 1 operation to 88 operations. I would say to you that one of the good things about the Lothian Surgical Audit is it has focused people's mind on the fact that you're going to have to present your data on an annual basis.

It became apparent in the 1950s and 1960s that if you went into a hospital in Lothian with a ruptured aortic aneurysm your chances of surviving in the hands of one set of individuals was 2-3 times better than your chances of surviving in the hands of another set of individuals. It didn't take long before people started referring, and this is the pattern I would like to see evolve in other areas. I'd much rather the profession collected its data, defined what it was doing, decided what needed to happen and put its house in order, rather than have some arbitrary imposition by people from outside. We've already done it for ruptured aortic aneurysm, in that all the vascular work in Lothian now goes to one unit and

the results are as good as, if not better than, the results of any vascular unit in the country. We also did it a long time ago for the surgery of prostatic enlargement - this was the early development of urological units. What I'm dealing with here is whether we should be doing the same thing for colo-rectal cancer. To an extent it's happening already. I haven't done a colo-rectal operation in the last 4 years. I send it all along to my colleagues along the corridor, conversely they send us their pancreatic, biliary and hepatic work back again. I think the number of surgeons performing operations in 1s and 2s a year is going to disappear. Even in our study, 6 consultant surgeons were responsible for more than half of the patients, although 28 surgeons were responsible for the care overall. Here is another one of our big problems in this area. A third of these patients present on an emergency basis. A third of them require an emergency operation, in a third we've been able to delay it to a semi-emergency, and only in a third of our patients are we undertaking elective surgery. That's a terrible indictment, not only of our ability to pick out these patients from the population, but our ability to serve them properly.

As you are all well aware there's another layer of debate behind this of course. The CPOD (Confidential Enquiry into Perioperative Death) has been a very major factor in focusing our minds. We are about, we hope, to open a CPOD theatre in the Royal Infirmary of Edinburgh and we would hope we're going to avoid the situation in future of where a registrar or senior registrar was expected to operate on these patients, or a consultant was expected to squeeze them on the end of an elective list somewhere. Most of these patients could be handled more appropriately by the intelligent use of the CPOD theatre than we've been handling them in the past.

This is another terrible statistic. A Duke's A cancer is one confined to the mucosa. If you get it at that stage and remove that section of the bowel you'll cure the patient. A Duke's B cancer has spread through to the serosa and still has a reasonable prospect of cure. A C lesion has spread to involve the lymph nodes and the writing is going on the wall. A D lesion has spread to involve the liver and, as you can imagine, that is not going to be curable by surgery. In Lothian at present, we are diagnosing only 9% of our patients with Duke's A cancers. So if I'm looking into the crystal ball, I think one of the things that would be happening in surgery would be identifying these patients and shifting this pattern of referral. We would be screening the population, we'd be using molecular genetics to identify patients and families at risk, and we'd be screening them particularly intensively by colonoscopy.

Comparing our results in the national league, I think we do rather well. If you look at leakage rates after various forms of colonic resection, they are very low. The leakage rate in the more extensive colonic resections, in particular anterior resection, is where it begins to matter in terms of outcome. I would say to you, if you wanted to improve the 5 year survival statistics for colorectal cancer tomorrow at a stroke, it wouldn't be by rushing out and finding magic chemotherapeutic agent X, it would be making sure that these patients were only operated on by someone who was going to give you a low leakage rate and therefore a low operative mortality. I think



you could probably improve the overall survival rate of colorectal cancer in Scotland by something of the order of 10% by making that basic change.

If you don't believe me, consider this. With only one or two exceptions, the majority of patients with rectal cancer are being offered sphincter saving surgery in other words the surgeon is trying to remove the cancer, restore intestinal continuity and not condemn the patient to an abdominal perineal resection. Some surgeons now are offering virtually all of their patients with rectal cancer a sphincter saving procedure. There may be very good reasons, but the data we have will show an individual surgeon who is only saving sphincters in 40% of the rectal operations he does and he has a leakage rate of 75%. Now I think there's a very clear message there that says he should stop doing that sort of surgery. I think this is what is now happening in Lothian in that we are beginning to say - well maybe that's inappropriate, we should maybe do more outpatient hernia repairs and we should concentrate this experience in the hands of people who we know are going to get the results that the public expect.

I think I'm touching on very delicate issues here. You can only get data like this if you have the positive collaboration of all of the surgical community. I think that speaks volumes for the surgical community in that they're willing to collect this data and have it scrutinised like this. But you can understand it's dynamite. You can envisage the situation - surgeon H is identified and is pilloried. There may be some reasonable explanation for some of these apparent discrepancies, but I think it's very important for the professions to know what these discrepancies are, to know what the variation in performance is, and to make sure that we're offering the public optimal performance. There's no doubt in my mind, if we don't do it ourselves someone is going to come and do it for us.

Just in case you think we're patting ourselves on the back too much, you know marvellous surgical community, isn't it great getting this data together, discussing it intelligently, we still have a very long way to go. If we consider the performance of surgeons looking at their status, consultant, senior registrar, registrar or SHO, and who did the operations in the Lothian and Borders study I've just mentioned, as you'd expect quite a lot of operations are being done by senior registrars. The discrepancy is that the consultants are doing the lion's share of the elective surgery (396 elective operations out of 574 done by consultants) but when you come to the emergency operations, the consultants are doing a minority of that surgery (only 22 of the 87 emergency operations). I think we as a surgical community have to accepted that that is not good enough.

Now we all know there are reasons why you can explain this away. Consultants can't be in two places at once. I don't think we've paid enough attention to our emergency workload. 70% of the workload of the Royal Infirmary of Edinburgh right now is emergency and we deal with it as if its an annex to our normal elective day to day work. We add things on the end of lists, we get the juniors to do them out of hours. It is totally inappropriate and if we're going to move towards a very strongly consultant led service, we are going to have to make sure that we have the facilities available to us in the form of CPOD theatres, but also that we have no more excuses for this sort of pattern. At the end of the day a consultant was present at 74% of the operations. I would submit to you that that is a very good statistic when viewed in a UK context, but it's nowhere near good enough.

I think we've got a long way to go in this era of increased public awareness and sensibility as we go from this century into the next as far as our surgical practice is concerned.



*Anaesthesia and Surgery Approaching the Millennium*



# JOHN GILLIES MEMORIAL LECTURE

## TECHNOLOGY - FRIEND OR FOE

DR. GAVIN KENNY

The 18th John Gillies Memorial Lecture was delivered by Dr. Gavin Kenny, Director of Anaesthesia at Health Care International Hospital, Clydebank, in a manner only he could. The venue was the Lister Postgraduate Institute in Edinburgh on the 17th November 1995.



It's a great pleasure and a tremendous privilege to present the Gillies Memorial Lecture and to have the chance of addressing so many of you who stayed, given the lateness of the hour. It is an unusual Lecture to present because often when you're invited to speak, you are told this is the topic and so you've got to get the relevant slides together and off you go. On this occasion I was allowed to choose something I wanted to talk about myself and this is a rare indulgence. Normally what I do is I get my slides organised, I bring them along in my case, drop them into the projector and that's it. But I thought - no, no, no! Here we're talking about technology and I can't use the old type of technology and so for the first time this is a presentation I'm going to give using a computer. If time allows, I am hoping to dial into the Internet to do a bit of surfing and show you what's possible there. I guess we should really have a rule that you don't, as it were, entertain or work with, dogs, children or computers.

The topic is - Technology - Friend or Foe. I've been involved in the development, in the testing, and the application of technology for about 17 or 18 years and I suppose I haven't really answered this question yet. At least, I'll give you some of my thoughts on it.

Certainly, I think you would probably agree that we have increasing complexity in the anaesthetic work-

place. There are increasing amounts and complexity of monitoring. There are an even greater number of alarms and the trouble I find, is that if an alarm goes off, you then try and find out which of 20 or so monitors is actually making the noise. They all sound the same, and because they're so high pitched you can't actually hear where they're coming from. Anaesthetic machines can now be so complex that it's a bit like star wars when you walk into the anaesthetic room to actually give an anaesthetic. What were things like in the good old days when I started anaesthesia? Yes, it is 1973 - that's the day I first walked into the ward to learn about giving anaesthesia. Some of you may well remember drugs like propranolol. You would give it to a patient, they would hyperventilate and Ronnie would have the back slab on and be getting the next one in on the trolley before the last one woke up. Once we ran out of trolleys in the Royal Gatehouse. It was a very icy day, pensioners were collecting their pensions and many of them ended up in casualty. Propranolol was a superb drug. What sort of monitoring did we have then? It was basically the educated finger. You actually touched the patients in those days! You looked at the patient and you felt the pulse. All the machines had sphygmomanometers connected to them and the real experts, like Geoffrey Parbrook, would actually use the Von Recklinghausen's oscillotonometer, not just talk about it! Then I went to the urology theatre, and there was Mike Telfer with this thing called an ECG monitor with a dot on the screen like a little bouncing ball for monitoring the electrical activity of the heart. Every now and then you were allowed into the cardiac theatre where there were these big dials on the wall which moved up and down. These were intra-arterial and central venous pressure monitors, only to be used in very very special situations.

It's now 1995 and it's exciting. Of the list of drugs available and commonly used today, hardly any of them, in fact I'm not sure any of them, appear on a similar list for 1973. So we have available new drugs, new agents, new things to play with. What about monitoring? What about cardiovascular monitoring? Throw away the educated finger. There are now monitors which automatically measure the blood pressure. We can perhaps measure or get some indication of where the cardiac output of the patient is, non-invasively. There are pulmonary artery catheters that will measure mixed venous saturation and provide continuous cardiac output measurements. These, I must say, are really of tremendous value for some major cases. Respiratory monitoring hardly existed in 1973. Now we monitor the arterial oxygen saturation with a simple finger probe.



That's made a phenomenal difference, we believe, to the way we practice anaesthesia.

There are a variety of new technologies available to us now. I should like to review this new technology in several sections. I'm going to talk about closed loop control systems, about infusion systems, about medical records and then about electronic education and we'll see how things go whether we have time to 'surf the net' or not.

### CLOSED LOOP CONTROL SYSTEMS

What are closed loop control systems? The aim in a closed loop system is to improve patient care by relating the delivery of the drug, or the therapy, to the requirements of that individual patient. They will also provide automatic data storage because they're measuring things and can store that information. For research, they are of tremendous value because they take out all the observer bias. The machine in a closed loop system actually carries out the therapy. To have balance, we have to have some sort of input signal. For example, in monitoring blood pressure, that signal would probably be the intra-arterial waveform. There needs to be a test which determines what the blood pressure is, what it should be, detect an error and correct it. To do this requires an output device which will bring the blood pressure to where you want. The input signal is the most important feature. If there is not a good input signal then the rest is futile. It's important therefore to make sure that artifacts are avoided. If the arterial line is flushed or zeroed, the system must pick this up. It requires a sufficiently rapid response. There's no point in trying to control something that happened ten minutes ago. The signal value must be detected sufficiently fast to allow rapid control.

The idea and value behind closed loop systems is that they provide better control for any measured variable. As I suggested, they are useful for research because they will give unbiased assessments of drug requirements. In terms of applications, blood pressure I've already mentioned, and it can be applied to neuromuscular blockade. I would suggest that postoperative analgesia using Patient Controlled Analgesia, where the patient is the sensor and also closes the loop, is a form of a closed loop control system. For many years there have been attempts to try and close the loop for general anaesthesia.

In terms of the need for any closed loop system, the question we have to ask is - can better control be achieved than with a standard manual system, and if that is the case does it actually matter? Is better control clinically valuable? To take a few examples. Blood pressure can be measured from an intra-arterial line. The raw analogue signal is passed to a computer which has the programme to compare the signal with that which we wish to achieve and then controls the output of some device which will infuse a vasodilator drug like, for example, sodium nitropruside. The system will then bring the blood pressure down towards a target and so it goes round the completely automatic

closed loop control system. One of the first systems we developed was using the old trusty Apple 2 Mackintosh and Braun infusion system, infusing nitropruside. We moved on to a more modern system which used the Atari computer and this time we had it linked to two infusion systems to try and see how well these drugs worked.

In essence all the results of many many studies comparing closed loop systems and manual control have been the same. To use blood pressure control again as an example, patients whose blood pressure was controlled by the nurses spend more time outside the desired range of blood pressure than patients whose blood pressure is controlled by the computer. Almost all studies that have looked at this have shown the same thing. The reason is not difficult. The nurse has a lot of things to do, the computer just has to take this measurement and then titrate effectively the nitropruside against it. Blood pressure, controlled in a closed loop control system, gives us better quality control. The equipment is available as a commercial system developed for this purpose. There are a few down sides - it requires training of the staff and staff pass through the ICU fairly frequently. Also there appeared to be no clinical benefit demonstrated. This was brought home when I realised that some surgeons were asking us to control the systolic pressure at around 110 while others said they wanted it to go to 160-170. You think to yourself, do we actually require this precision of control in reality, and the answer is probably not.

What about neuromuscular blockade? Again the systems that have been developed show a better quality of control, but again it probably doesn't matter - there is no demonstrable clinical benefit for the effort involved in it. Even if we overdose a little bit on the drugs we have available nowadays, the effect will soon wear off. The patient will come to no harm.

Patient Controlled Analgesia is used very widely and increasingly so. What are the perceived benefits for the patient and for the staff? I had a minor skiing accident which required me to take myself off to Tom Mann who eventually persuaded me to have an operation. I got the team to set up the PCA afterwards. This was really superb. I remember waking up about 3.00 a.m. feeling really not too bad but the patient next to me, who had had the same operation - a laminectomy - I could hear the groan starting up, so I thought - poor chap! Anyway, about 10-15 minutes later a passing nurse heard these groans which were sufficiently large in volume now and she asked him what the trouble was. He said his back was sore. Off she went to phone up her colleague who came along. Meanwhile, the man's groans were getting louder and louder. Eventually you could hear the key of the cabinet open, the pop of the ampoules and about half-three quarters of an hour later the man got some morphine. Meanwhile I'm going beep beep, beep beep! So I can tell you, if you have to have an operation, if it can't be done with a local, or even if it can, ask for PCA by name.

We can evaluate Patient Controlled Analgesia as an

improved quality of analgesia. I can tell you this because in previous operation I had to rely on the mercy of the nurses and if you were two hours beyond your last dose you got nothing else. You had to wait for the four hours before it was time for you to be sore, you couldn't get anything earlier! So with PCA the patient has improved quality of analgesia. It's the patient who decides what is the balance between the pain relief and the side effects of these agents, and they decide where they want to be in terms of nausea, in terms of dizziness, in terms of analgesia. The nurses have a comfortable patient who can look after themselves better, who smiles at them when they appear, and the doctors value it sufficiently to ask for it for themselves and also for their families.

If we consider the value of closed loop systems, PCA has become successful while the others have not. We have to consider the balance between the additional time, the complexity and the perceived benefit for any technology we are going to introduce. Closed loop systems must function at least as well as conventional systems. They must be required either for clinical or research use and there must be all obvious benefits available either for the patient or for the staff and ideally for both.

## INFUSION SYSTEMS

Infusion technology is rapidly changing, from the simple drip sets we started off with to volumetric pumps and low volume syringe infusion devices. The most incredibly powerful drugs were titrated just by an educated thumb organising the drip rate. Then came out the controlled drip systems where it counted the drips and only let a certain number through. We then progressed to volumetric pumps which can give us high volume with controlled flow and finally the low volume syringe drivers which are so prevalent nowadays. Someone then thought about this dreaded word - 'pharmacokinetics' - and said if you just use the equations, which are really basically very very simple and apply them, then you'll be able to use intravenous drugs very very simply. I believed this initially and I tried it out. I found it really was a little bit more complex than that. The concept is that the three compartment model reflects the way the body handles these drugs. The drug is added to the central compartment and starts to be removed by metabolism. It starts to move into the third compartment and back again. For each of these movements there is a constant which describes this - all very straightforward. You've got your syringe driver, you've got your syringe, you've read the book, you've probably seen the film, and so off you go!

To achieve a certain target level in the blood, in the central compartment, the initial dosage is not too difficult. Take the volume of the central compartment, multiply by the target, say, 6 mcg/ml for example for propofol, and it gives a value of 96 mg or 9.6 mls. If we give that we'll more or less be there. In reality, as we add it, if it takes about 20 seconds, the drug will be metabolised and have a little bit of redistribution. These factors can be taken into account in a more accurate equation, if

you have a calculator beside you. Having achieved our target, how do we keep it there. There are a variety of suggestions which work for certain levels, so some have suggested you go at 12 mls/kg/hr, then 10mls/kg/hr then 8 ml/kg/hr, others suggest 10-8-6. In reality, if we want to achieve different levels we do not have the recipes. A more accurate way of doing this involves using your calculator again in a more complex equation.

What about decreasing the target concentration? If we want to do that we have to switch off the infusion and calculate the movement of drug back between these three compartments. There is an equation which defines this but even with a fast fingered operator and a calculator, it is starting to get difficult. So there is a practical problem, in terms of using these drugs.

What is needed is something that makes it easy, something that's simple to use because we want to keep this complexity in the operating theatre down. The solution must make it easy to change the depth of anaesthesia in response to varying levels of surgical stimulation. Ideally we should use the skills we've already got and gathered, in some cases over several decades. The answer, as I'm sure you know, is to use a device which is similar to a calibrated vaporiser which will let us change the blood concentration and change the effect the drug achieves in a controlled organised manner. That then led to the concept of Target Controlled Infusion systems. One of the first systems we developed was based on the Atari computer. It was bulky, but showed at least the concept could work. The system could actually use this concept to produce clinical benefit. Of course it was not possible really to use this in any general way because of its bulk. That's when we developed the system based on the Psion, which is still being used in many many hospitals. The system is now much more portable, it can be locked up and doesn't wander. But of course it was not designed for medical use, and so we then developed the next system which was built up with a medical grade power supply, with double processors and so forth.

This system is now being developed commercially. The next version in fact may resemble the standard Graseby pump because it uses the same case. It's going to be called the Graseby 3500. The anaesthetist simply dials up a concentration and the system will then achieve it. A refinement of this is to add a Patient Controlled Analgesia device to it and we then have a device which learns over time what concentration of drug the patient requires for analgesia and aims to maintain that concentration.

The perfuser system consists of two processors, an 8 bit and a 16 bit processor. These are from different manufacturers. As I'm sure you're all aware, the pentium saga exposed just how these systems could effectively go wrong. If they go wrong in calculations then this is obviously of great importance. We used deliberately two processors from different manufacturers. These have two different programmes - the larger processor transmits the new rate to the pump whereas the smaller processor actually measures how much the shaft of the



pump has turned. The 16 bit processor uses a true mathematical solution with a very large series of calculations, whereas the smaller processor uses a much simpler approximate mathematical solution, and the two then have to compare both calculations and be within a certain range. We have tried to build in as much safety as possible into the system. We tried to find out how this actually influenced the use of propofol in total intravenous anaesthesia to maintain levels and found that this had a major influence for most people, not everybody, because it's easier to use than a manual system where they had to think about the kinetics. They were more confident where they were in terms of the anaesthetic effects and the quality of recovery. Some suggested that, surprisingly, it was good for quick cases because one could establish anaesthesia quickly without the need to transfer to a volatile agent.

A recent study compared the use of TCI (Target Controlled Infusion) with manual control. Of the eight consultants who each anaesthetised 20 patients, six of these consultants found this system to be simpler than a manual system. Somewhat paradoxically, seven of these eight would use this in preference to a manual control infusion system. It looks as if with TCI we can reduce the stress with using intravenous anaesthesia in the operating room. It is simpler to use than the conventional approach.

#### AWARENESS IN ANAESTHESIA

A question forefront in most patients' mind is 'will I be asleep'. Awareness is really very simple for surgeons - their view is that if the patient is not moving then they're asleep, if they are moving then they're awake - and the view then could be if the patient can stay awake during this operation, why can't you! In terms of trying to detect awareness, it may not be identifiable from the standard measurements made from the observation of the cardiovascular data that we record from our patients. It can cause major trauma during surgery and it can also lead to longer term effects. It is something we obviously must try to avoid.

I want to briefly explain the results of a study where we looked at this transition between consciousness and unconsciousness. We had patients who were scheduled to undergo lower limb surgery with regional anaesthesia and standard premedication. Our first investigator recorded the auditory evoked response at the start of the study. The second investigator used TCI propofol to induce unconsciousness and we defined this as the loss of both response to command and eyelash reflex. The concentration of propofol was then reduced to allow the patient to regain consciousness, defined as the return of the response to command and return of the eyelash reflex. This cycle was repeated several times. There was no significant difference for heart rate or for systolic arterial pressure changes between the conscious and the unconscious period. If we had been relying on these then we have had no guidance at all. We finally analysed the auditory evoked response and found that there were significant changes for some of these wave forms for all the transitions. The changes in the first positive and second negative wave were statistically

significant after all successive changes of state, from consciousness to unconsciousness and vice versa. We asked the patients the day after surgery - could you remember what happened to you and they all recalled the clicks being played before the start of the administration of propofol but of the 11 patients, only 2 actually remembered the command that followed thereafter. Nine of the 11, had absolutely no recollection of anything after we started the infusion, and all of them said they would be happy to have the same sort of anaesthetic again.

As I stated earlier, the input signal is the most important component of any closed loop control system. We require good artifact rejection, we mustn't act on the wrong information, and it must be sufficiently rapid to enable us to take the correct action.

That leads me now to the use of closed loop control of depth of anaesthesia. The auditory evoked response can be used as an index of the depth of anaesthesia as I discussed. We can take a single number from the auditory evoked response and feed it into a standard control system as I outlined for the control of blood pressure. The system controls the target blood concentration of propofol, using a standard Target Controlled Infusion device. The system then alters the infusion of propofol to raise or lower the blood concentration in response to the auditory evoked potential, and so change the depth of anaesthesia. The system always tries to cut back the infusion rate of propofol. The concept is a completely automatic closed loop control system of the depth of anaesthesia.

From this one can perhaps build up an idea of the true balance of anaesthesia. We would balance the stimulus, the analgesic and the hypnotic. The concept could be that stimulation will lead to increased stimulation of the patient, increased arousal and this might show itself, for example, by increased movement of the patient. After all, MAC deliberately sets out to have 50% of patients moving. Where we paralyse the patient and lose this very valuable sign, then we have to rely on autonomic changes. Sometimes these are not accurate as we've found already and so the patient may be aware and may or may not have recall. We can control the situation either by giving more hypnotics or else we can have higher concentrations of analgesics. With more analgesics, there will be less stimulation and less need for hypnotics. If we use a total regional block, then we have no stimulation from surgery at all and the patient can stay awake if we want, but if we get them off to sleep we require very very small doses.

#### ELECTRONIC MEDICAL RECORDS

Automatic anaesthetic records system have been under development for many many years. We developed some in the early 1980s. What we need from these really meets one of the requirements from the legal viewpoint, which is quite simple. If it wasn't recorded then it wasn't measured. We require the ability to acquire on-line data accurately, this is still an outstanding problem of these systems. It must be simple to enter off-line data. It should be as easy, if not easier than actually writing the

information down. A challenging list of requirements for these systems. Any system must work effectively with both long major cases and short minor cases. We mustn't have the anaesthetic record taking longer than the actual procedure itself. It must be easy to pre-configure it so, for example, for cardiac cases I would use a different configuration than I would for smaller cases. Other colleagues would use different configurations again. So we want to configure it for drugs, for fluids, and also for procedures.

The system we use is based on the Informatics Recall System. It has a screen, a keyboard and a mouse. It's organised so that the frequent things we would do, such as, induction of anaesthesia, intubation and incision, are selected by icons. For example, if I click on induction, it will automatically give all the drugs we use for that procedure. The doses can be altered afterwards. There are pre-configured drug lists with fluids for certain procedures. To repeat a previous item simply click on that line and it will automatically update it. This is something we've used from day one at Health Care International. We don't have any paper records and I think people are reasonably pleased with it. The sort of benefit we would find is, we have a legible record which is contemporaneous. When something happens it's recorded automatically because the data is collected on-line from the monitors. There have been various measurements made of the time taken to make an anaesthetic record. It is estimated that with automatic records systems, data entry takes about 3-7% of the time of the whole anaesthetic, compared with manual recording which can take 25-35% of the time. Now obviously it depends how much you record and many of these studies have been done in the United States where surgery certainly takes a long time and they certainly write a lot down as well. There is the potential for decrease in litigation because if we can show that these measurements were made, that the record was produced at the time. This then provides us with a degree of defence.

What are the benefits for management? I think most of us who have looked at this would agree that if you collect data at source then you have a higher level of accuracy than if it passes through different people who perhaps are less committed because they are less involved with the data being collected. Figures for theatre utilisation can be obtained. We can have accurate reports of trainees, who was there, what the level of supervision was, what were the cases, and we can make some approximation of quality assurance once we decide what are the factors that are important. For example, hypoxia - what is the incidence of that? Hypertension - what is the incidence of that? If we can decide what it is we think represents quality then these systems provide us with the sort of tools we need if we are going to analyse it sensibly. It also allows sensible coding of surgical information.

Of the many problems, cost is the single major problem. If these systems were freely available then I suspect most people would have them. There still is the problem of individual data analysis and individual reports.

Standard reports are available but if you want something specific then it can be difficult to achieve that. I think from the monitors we use, we probably still require a better artifact rejection.

## ELECTRONIC MEDICAL EDUCATION

Electronic education is something I was involved in many many years ago in the old CAL programmes with the Apple computer. Now things are changing where a whole variety of new items are available in terms of electronic publishing. On the Internet we can find journals and journals which are published only on-line. Searching on any topic is easy. There are various interest groups - paediatricians, those who are interested in acute pain, cancer pain, and hopefully I will try and show you some of these later on. There is a mass of other information there, if we know how to find it.

CD roms have changed dramatically in the last few years. They used to be only used for playing music but now we can get journals, we can get med line on them, we can get text books, multi-media, and anatomical models like Adam on it. As an example of this, this is one suite of text books which is now available on a single CD rom. If you want something, say cardiac output, you can click on it and the text book of internal medicine will then show you where this appears in these other books as well. To find information is becoming much much simpler. Miller's fourth edition of Anaesthesia is now available on a CD rom. If you want to find out about, for example, computers and propofol, you simply enter these at the search mode and it will show you the 20 or 30 items where these appear. It will take you to the text, you click in a reference, it will take you to an abstract, the med line abstract of the reference. It is a new way of producing information. This interactive regional anaesthesia disc shows graphics of how the anatomy is organised, it shows video clips of how to actually perform the blocks - a completely different way of learning from what we had in the past.

The past five years of prestigious journals is available now on a single CD rom. Instead of having perhaps 250 single journals occupying space in your study, you have one single CD rom. Instead of saying, look I'm sure I read some article about this, it was maybe two or three years ago, now which journal was it, you simply search on it and it finds it for you. This is revolutionising the way we are actually studying.

We've heard about the Internet several times today. The Internet is a collection of information stored on a network of separate host computers. It is estimated that at the present time there's probably between 30 and 40 million worldwide. It's estimated that every year this is liable to double. It's an immense structure, largely non-commercial and the world wide web is the latest development of this.

What I thought I would try was to actually show you how we can go into the Internet. If you say you shouldn't work with dogs, children and computers, you certainly shouldn't work with on-line systems, but we'll try.





*Dr. Kenney then demonstrated to the members of the Society why you should not present live with on-line systems as he 'surfing the net'!*

Let us consider the way the Internet is actually produced and organised. We can compare this with human centred work. People propose something, science then studies it, and industry has to conform to make it actually work. I want to just mention a feature found in the aircraft industry called 'automation surprise'. The industry had developed autonomous powerful computer systems that were put between the pilot and the aircraft. The way the plane was controlled was by the computers, with relatively weak feedback to the human pilot. Occasionally there could be a breakdown in coordination with what the pilot and what the computer wanted, with delay in recovery of error. Basically people are good at error detection and correction but computers are not. What was found was new types of errors. Things like - what is it doing, why is it doing this, what will it do next? How did we get into this mode and more importantly, how do we get out? These are real problems that were occurring in the aircraft industry. How did they solve this - how did they cope with this level of complexity. They found one way of doing it. If you want to take off, you put this switch here, that switch there and you will be all right. Forget about the other 15 ways of doing it. They found that if the mode was restricted, for example, I'll switch that off and I'll switch that off, that means I've only got 5 choices instead of 15 now, it was easier to cope. Pilots tried to escape in situations of high stress to a simpler mode where they actually controlled the plane themselves, where the computer was switched out, or was in a less powerful position, less in control.

I think when we are designing technology, we often see the developers telling us how simple this is, how easy it is to use. Whereas in reality, when we actually try it, we

may find that its increasing complexity gives new burdens on us that we didn't have before and has complicating factors that we never actually even thought about previously. Humans have a limited ability to track time, especially if things are going wrong and it's even worse if there are several different things happening, several tasks we've got to perform together. What is needed are graphical displays which show us where we actually are in any situation, which give us a visual representation of the problems we're facing and give us displays which will help support our understanding of the situation. Finally we need something that will make a task that we want to do but can't do, possible.

Technology must to let us undertake a task which would be impossible without the technology, or allow us to do a task we are doing already but do it better, simpler, easier and faster. If technology doesn't meet either of these two requirements then there is no point in having it. It's only going to make life more complex, more difficult, and perhaps find things that we didn't actually know about the system.

I think in terms of the future, we will undoubtedly have new monitoring techniques for anaesthesia and for intensive care. We will almost certainly have new drugs but the costs of development are incredibly high. Whether a drug is developed for anaesthesia which the patient may only have once in a lifetime or for some cardiac disease that they'll take for the rest of their lives, the cost is about the same. Both of these, I think, will only be developed if there's a market for them, at least if the manufacturers anticipate there will be a market.

We have an increased need for high quality information about the workload we have, about the training we provide, about the overall cost benefit ratios of our therapies. Hopefully, along with that we will have better and easier to interpret information through technology about our patients so we can actually look after them better.





CONTINUOUS THORACIC EPIDURAL ANALGESIA  
VERSUS COMBINED SPINAL/THORACIC EPIDURAL

ANAESTHESIA/ANALGESIA ON PAIN, PULMONARY FUNCTION AND THE METABOLIC  
RESPONSE FOLLOWING COLONIC SURGERY



Kenneth S. James

Pain, pulmonary dysfunction and the neuroendocrine response are all inevitable consequences of surgery and the severity of each correlates well with the magnitude of the trauma(1). Some authors have considered these responses as unnecessary components of modern surgery(2) and there has been a large amount of data collected in recent years regarding the influence of anaesthesia, particularly regional anaesthesia, on these responses to trauma(3). Although they can be largely obviated by regional anaesthesia for procedures below the umbilicus, neither general nor opioid analgesia have a major influence on the responses to upper abdominal surgery.

Recently the use of continuous spinal anaesthesia was shown to significantly obtund the metabolic response to trauma following colonic surgery(4). However this technique has several disadvantages which make its routine use difficult to implement, namely non-segmental blockade and lower limb paralysis, hypotension, and perhaps, an increased risk of dural sepsis and the cauda equina syndrome as a result of an indwelling catheter. The combination of intra-operative 'single shot' spinal anaesthesia with postoperative epidural analgesia can obviate these postoperative problems. In theory, too, by providing a more profound intraoperative block this combination might lead to a pre-emptive state reducing pain and postoperative analgesic requirements and may lengthen the duration of a continuous epidural infusion (5). By achieving a deep initial block until after surgery, the neuroendocrine response may be diminished also.

The aetiology of postoperative pulmonary dysfunction is multifactorial(6,7) but sympathetic reflexes have been shown to contribute(8) and thus again, a more dense intraoperative block may help to reduce the problem postoperatively.

In this study we attempted to show whether a sustained effective block using the combination of intraoperative spinal anaesthesia and postoperatively epidural analgesia could have beneficial effects over a sustained effective thoracic epidural anaesthesia and analgesia alone with regard to pain, pulmonary dysfunction and the metabolic response to colonic resection.

PATIENTS AND METHODS

The study was approved by the Hospital Ethical Committee. 20 patients of ASA status 1-3 and scheduled for elective colonic surgery were enrolled into the study having given informed consent. Patients with a history of liver or endocrine disease, beta-blocker or steroid therapy within one month of surgery were excluded from the study.

All patients received temazepam 30mg orally 2 hours before surgery. In the reception area or on arrival in the anaesthetic room, following intravenous access with a 16 gauge venflon, all patients had a thoracic epidural catheter sited between T8-11 for postoperative analgesia. The patients were randomised to receive one of two regimes. Patients in Group 1 receive a high spinal block for intraoperative anaesthesia using 6mls of 0.5% bupivacaine injected at the L2/3 level to achieve a block to T4. This injection was covered by 40mg IM ephedrine to prevent hypotension. One hour after the onset of the block, after surgery had started, 15mls of 0.125% bupivacaine was injected into the epidural space and a continuous epidural infusion of 0.125% bupivacaine plus 15mg diamorphine in 600mls (i.e. a 0.0025% solution of diamorphine) was commenced and scheduled to run for 4 days. In Group 2 patients were given epidural 0.5% bupivacaine to establish a block to T4 followed immediately by a continuous epidural infusion of 0.125% bupivacaine plus 0.0025% diamorphine and the infusion ran for 4 days.

Only the first 24 hours were investigated in both groups. IV glucose was avoided throughout the study period.

Once the block was demonstrably at the T4/5 level, general anaesthesia was induced and the patient intubated with 2mg/kg propofol and 0.01mg/kg alfentanil and maintained with 50% oxygen and air and enflurane. Nitrous oxide was not used. Intermittent positive pressure ventilation was used for the intraoperative period



to maintain end-tidal CO<sub>2</sub> between 3.5 and 4 kilopascals and additional muscle relaxation was achieved only when requested by the surgeon using vecuronium 1-3mg. Neostigmine and atropine were not used to reverse the effects of the vecuronium. Each procedure was covered with cefuroxime 1500mg and metronidazole 500mg intravenously and a urinary catheter was inserted. Intraoperatively, hypotension was treated with further boluses of ephedrine if the mean arterial pressure fell below 60mmHg and postoperatively, if the systolic blood pressure fell below 90mmHg.

All the procedures were performed by only 2 surgeons using a midline incision which was extended above the umbilicus when the splenic flexure required mobilising.

Following surgery the patients were transferred to the recovery room and stabilised prior to transfer back to the main ward. Every patient received instruction in the use of a PCA machine preoperatively, to control pain which developed despite the continuous regional technique. In patients in whom the block had regressed, a top-up epidural bolus of 2-5mls bupivacaine 0.5% was given and a higher infusion rate was then selected.

The following measurements were made on all patients. Blood was removed from the antecubital fossa preoperatively and at 1, 2, 3, 4, 8 and 24 hours after skin incision. It was then stored at -25°C until all patients had completed the study and batch was then analysed for plasma glucose and cortisol. Glucose was measured enzymatically using hexokinase method on an Olympus discrete multi-channel auto-analyser and cortisol using a fluorescence polarisation immunoassay (FPZA) on the ABBOTT IMX system. Forced vital capacity (FVC), forced expiratory volume in the first second (FEV1) and peak flow rate (PFR) were performed preoperatively and at 8 and 24 hours after skin incision using a Vitalograph and a mini-Wright's respirometer. Visual analogue pain scores (VAS) at rest, cough and mobilisation were performed preoperatively and at 4, 8 and 24 hours after skin incision. The time to recovery of full lower limb muscle function without paraesthesia was used to decide when the effects of the spinal technique had worn off. Block height was measured using ice every hour for the first 12 hours and then 3 hourly.

All urine was collected for the 24 hour period in a plastic container containing hydrochloric acid and subsequently analysed for dopamine, adrenaline and noradrenaline using high pressure liquid chromatography (HPLC) following extraction on to alumina. PCA morphine analgesia was administered via a Graseby PCA machine and the total requirements in the first 24 hours were recorded.

All comparative data were analysed using the Mann-Whitney test for unpaired observations.

## RESULTS

The two groups did not differ with regard to age, height, weight, duration and type of surgery nor serum albumin.

Mean blood loss was 266mls (+/- 78 mls SEM) in Gp 1 and 272 mls (+/- 81 mls SEM) in Gp2.

TABLE 1  
Demographic Data

	Epidural		Spinal/Epidural	
	Mean	SEM	Mean	SEM
Age (yrs)	42	5.36	51	5.86
Weight (kg)	72	6.27	64	4.72
Albumin (g/l)	42	1.61	42	1.47
Blood Loss (mls)	266	77.6	272	81.2
Duration of surgery (min)	134	13.5	160	22.5
24 hr PCA Morphine (mg)	12.9	4.09	8	2

upper Visual analogue pain scores (mean +/- SEM) on mobilisation and lower Mean upper level of blockade (+/-SEM) in the first 24 hours for patients receiving spinal/epidural - ■ - (Gp 1) and epidural infusions - ◆ - (Gp2).

No significant difference between groups

TABLE 2  
Procedures performed in the two groups

epidural	spinal
Proctocolectomy/pouch formation	Proctocolectomy/pouch formation
Anterior resection	Proctocolectomy/pouch formation
Proctocolectomy/pouch formation	Proctocolectomy/pouch formation
Anterior resection	Proctocolectomy/pouch formation
Anterior resection	AP excision rectum
Proctocolectomy/pouch formation	Right hemicolectomy
Sigmoid colectomy	Anterior resection
Colectomy & ileorectal anastomosis	Anterior resection
AP excision rectum	Sigmoid colectomy
Laparotomy & division adhesions	Sigmoid colectomy

upper, Plasma glucose in mmol/l (mean +/- SEM) and lower, plasma cortisol in nmol/l (mean +/- SEM) in the first 24 hours for patients receiving spinal/epidural.

- ■ - (Gp 1) and epidural infusions - ◆ - (Gp 2)

\* = p < 0.05

Pain relief was excellent in both groups throughout the study period. (Pain scores on coughing were similar to those on mobilisation (Fig. 1)

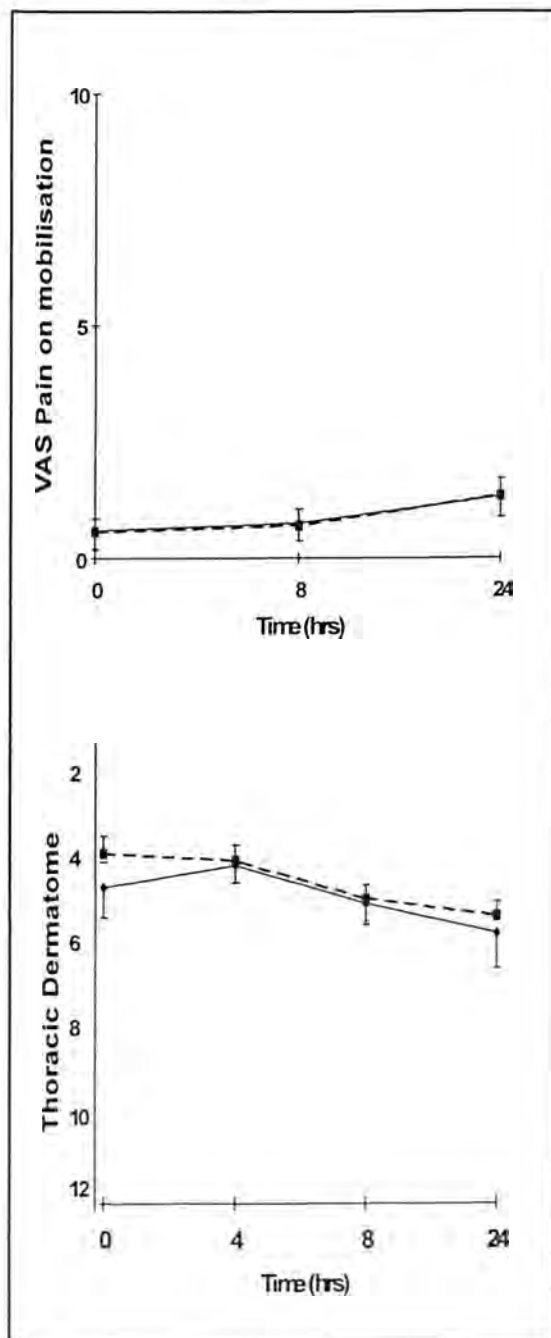
TABLE 3  
visual analogue pain scores  
median values / (interquartile range)

	spinal	epidural
4 hours	0 (0-5)	0 (0-0)
8 hours	0 (0-0)	0 (0-0)
25 hours	0 (0-6)	0 (0-0.75)

Median pain scores (plus interquartile range) at rest in Group 1 (spinal) and Group 2 (epidural)

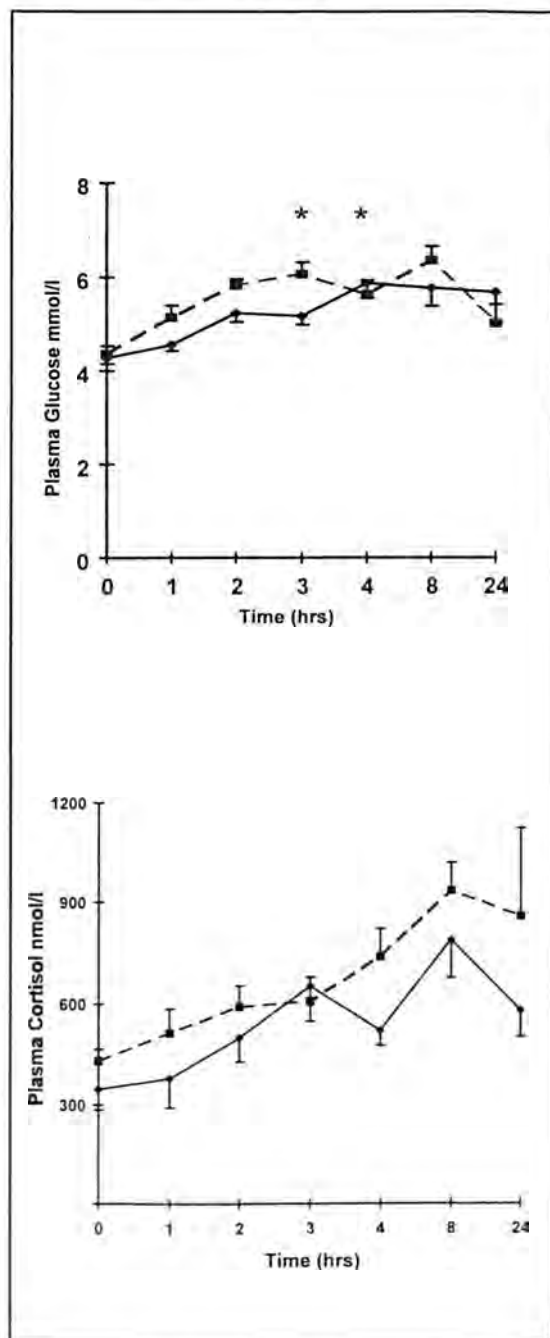
Forced vital capacity (FVC), Forced expiratory volume in the first second (FEV1) and Peak flow rate (PFR), preoperatively and at 8 and 24 hours following incision for patients receiving spinal/epidural - ■ - (Gp 1) and epidural infusions - ◆ - (Gp 2). No significant difference between groups.

FIGURE 1



No patient had a pain score on coughing or mobilisation greater than 4 and 13 patients were totally pain-free throughout the study period. The total number of adjustments (i.e. bolus +/- increased rate) to the epidural infusion in both groups in the 24 hour study period was nine, with only one patient in each group requiring as much as three adjustments. 6 patients in Gp 2 required PCA morphine compared to only 3 in Gp 1 but the average consumption was only 10mg in both groups in the 24 hour period. There was no difference in the height of the block between groups at any stage.

FIGURE 2



One patient in Gp 1 required atropine (0.6mg) for a bradycardia of 30-35 beats per minute in the recovery room to good effect. No patient in either group required ephedrine after theatre. There were no episodes of respiratory depression in any patient. The epidural catheter became disconnected in one patient in Gp 2 and resulted in a 5-segment regression of blockade before being reinstated after approximately 90 minutes.

With regard to the metabolic data, the blood glucose and cortisol results are shown in Fig. 3 and 4. There was



no statistical difference between the two groups except a significantly higher rise in glucose in Gp1 at 2 and 3 hours ( $p=0.0312$  and  $0.014$ ). All patients in this group could move their legs and had no paraesthesia at 6 hours suggesting that the spinal block had worn off before then. Despite this there was no difference in the plasma levels of glucose and cortisol ( $p=0.15$  and  $0.08$ ) at 4 and 8 hours in Gp1. 24-hour catecholamine studies (Table 4) showed no differences between the two groups for noradrenaline ( $p=0.8$ ), adrenaline ( $p=0.47$ ) and dopamine ( $p=0.36$ ). The pulmonary data are shown in Figs 5, 6 and 7. A 20-30% reduction for FEV1, FVC and PFR was demonstrated in all patients with no significant difference between the two groups.

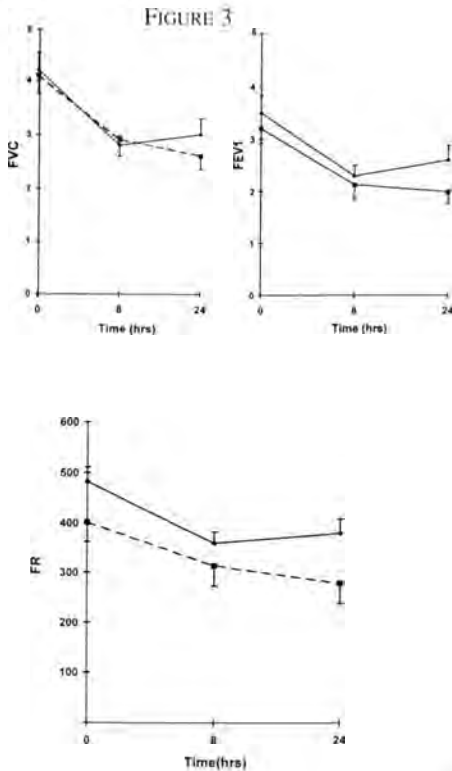
TABLE 4

	epidural		spinal		
	Mean (SEM)		Mean (SEM)		
creatinine (mmol)	12.6	(1.8)	11.6	(1.5)	
noradrenaline (nmol)	221	(31)	271	(66)	$p=0.8$
adrenaline (nmol)	104	(20)	81	(19)	$p=0.47$
dopamine (nmol)	1884	(175)	2125	(233)	$p=0.36$

Initial 24-hour urine volumes from start of surgery for creatinine, noradrenaline and adrenaline.

3 patients vomited in the first 24 hours but only one required anti-emetic treatment.

In Gp1, 1 patient developed proven anastomotic dehiscence and 1 developed cardiac failure thought to be due to anastomotic dehiscence on the 2nd and 3rd postoperative day respectively and despite intensive resuscitation and care both died.



## DISCUSSION

Our results have shown that there is no difference between the two techniques for any parameter measured. In clinical terms, total pain relief and early mobilisation of the postoperative patient may be important factors in improving the quality of patient care and postoperative morbidity (8). Both of these techniques resulted in excellent analgesia with no difference between techniques although any true difference could not be detected in such a small study since the pain scores were very low and the range was wide (Table 3). Furthermore, there was no evidence that the more profound intraoperative block seen with combined spinal/epidural anaesthesia resulted in a pre-emptive state thereby preventing regression of epidural blockade postoperatively. We were very careful not to let the height of the block fall during the study period. Of the twenty patients, three were able to walk on the evening of surgery and eleven could do so on the first postoperative day. Of those who did not mobilise, pain was not a major factor preventing their doing so.

Despite this excellent analgesia the well-recognised reduction in pulmonary function following abdominal surgery (6) could not be prevented. The aetiology of this is multi-factorial (7) and the contribution of diaphragmatic shortening is significant and unaffected by epidural anaesthesia (10) but sympathetic afferent and efferent pathways also contribute to the overall picture (8). The findings of this study suggest that these pathways are unaffected clinically by either technique. Patients could, however, cough and expectorate more easily in both groups than when using conventional opioid analgesia.

The postoperative effect on glucose and cortisol following colonic surgery has only been investigated in one other controlled study. These investigators demonstrated that a *continuous* spinal and epidural technique was better than an epidural technique at attenuating the glucose and cortisol responses for up to 4 hours after surgery (3). In another (uncontrolled) study of 14 patients undergoing colorectal surgery, continuous intraoperative spinal anaesthesia followed by continuous postoperative epidural analgesia plus a concomitant non-steroidal anti-inflammatory agent (NSAID) for 48 hours prevented the rise in cortisol but not glucose (11). The combination of intrathecal etidocaine and epidural bupivacaine in high dose was used in the uncontrolled study and this combination has been shown to provide better afferent block than epidural bupivacaine alone (12). In addition, the use of a NSAID may have reduced afferent input to the spinal cord as suggested by another study (13).

Our study has failed to reproduce the findings of these 2 studies and, in addition, we were unable to show any difference in urinary catecholamines for the 24-hour study period. We did use prophylactic ephedrine in the spinal group and not the epidural group but this would not be expected to produce a prolonged effect on glucose or catecholamines. Indeed, there was no difference

between groups for glucose at 1 hour after surgery and started suggesting that the subsequent higher rise in glucose at 2 and 3 hours in the spinal group was a result of intraoperative factors. However, in spite of the high dose we used (6mls of 0.5%) bupivacaine, single dose spinal anaesthesia may result in a short-lived block (1) which could explain the results.

The rise in cortisol in both groups suggests neither regime provided sufficient afferent block, in agreement with the findings for thoracic epidural etidocaine in another study (14). Spinal anaesthesia has also been shown not to be completely effective in blocking the transmission of somatosensory evoked potentials (15). Sympathetic pathways are known to contribute significantly to the neuroendocrine response. It may be that the overall efferent pathways involve the splanchnic nerves and the sympathetic chain more than has been previously thought. When regional techniques only involve the spinal cords, afferent information via these pathways may not be blocked and can thus pass unmodified to the spinal cord at a level above and/or below the existing central block as our study demonstrates.

In addition, the use of continuous techniques has major practical considerations. With spinal infusions there is now concern over the development of the cauda equina syndrome (16) and maintaining a high epidural block for such a prolonged period was labour intensive even though there were no clinical problems directly related to this. Although data from controlled studies suggest that the overall risk is not greater than for general anaesthesia (17), it is of concern that two patients died as a result of anastomotic dehiscence and the demonstrably vigorous peristalsis seen with this technique may be excessive in some patients.

## CONCLUSION

The use of thoracic epidural anaesthesia and analgesia provided excellent postoperative analgesia following colonic surgery allowing the majority of patients to mobilise the following day. Combined spinal/epidural anaesthesia conferred no additional benefit over peroperative thoracic epidural infusion alone, in this study, on analgesia, pulmonary function and the neuroendocrine response. The data from this and previous studies suggest that other techniques must be sought for preventing the neuroendocrine response to major surgery before the concept of stress-free anaesthesia can be realised and scientifically investigated.

## ACKNOWLEDGEMENTS:

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*In April 1995 the Society sponsored Dr. Eriks Sliders from Tiga in Latvia for a 4 week visit to Scotland. Dr. Sliders wrote back to the Society expressing his gratitude. Dr. Ian Levack organised a comprehensive programme for him and some of our members obviously made a big impression on Eriks! At risk of revealing too many details of the personal lifestyles of some of those and inflating the egos of others, the gratitude he obviously felt can only be conveyed by publishing the letter in an unedited form.*

“Dear Colleagues,

In the result of cooperation between the Scottish Society of Anaesthetists and the Latvian Association of Anaesthesiologists I was given the opportunity to visit Scotland in April this year. Nomination for this project I take as a great honour and I wish to extend my sincere gratitude to all of you as the travel and subsistence costs were covered by your Association.

The visit was organised by Professor John Mc Kenzie, Honorary Secretary of the Scottish Society of Anaesthetists and Professor Georgs Andrejevs, President of the Latvian Association of Anaesthesiologists. During the four weeks of my visit in different cities and hospitals of Scotland I was supported by Dr. Ian Levak, consultant anaesthetist from the Western General Hospital Edinburgh. Thanks to generosity of Dr. Ian Levak I was received in his house where they treated me like a real family member and gave me every support.

The program of my visit was extensive and diverse in activities - I could see a regular hospital and participate in the routine work as well as attend Intensive Care Society meeting in Brighton. During those days I met many anaesthesiologists from all over the Sotland. When talking to people I felt a true interest about my country and their understanding of developments in Latvia. Scottish people seemed to be more optimistic about changes and future prospects of Baltics as we ourselves are.

When learning about your achievements in intensive care and anaesthesiology I could see that in the country which has contributed so much to the development of these branches of medicine the nation's health is valued highly and



your resources for health care not economized. The selfless work of the doctors is remarkable. Your patients can feel safe - their treatment will be in accordance with high principles of humanism. During my visit at the Western General Hospital and Royal Infirmary of Edinburgh I had a chance to choose and visit any department I was interested to see. Dr.Ian Armstrong from RIE showed me even the Liver Transplantation Department of Scotland. In Latvia by now only kidney transplantation operations are carried out.

During my visit to RIE I attended lectures in anaesthesiology which at that time were given to the first year residents. I observed great dedication and interest from both the lecturers and the students. You have an excellent theoretical material base - books and publications and your students spend more time on them than in this country. In my opinion, and I will dare to say it, the anaesthesiology is a hard branch of medicine, if not the most difficult, and it takes a doctor maximum energy and devotion not only while studying it but also in an everyday work. Here do not see a difference between Latvia and Scotland.

I had also an opportunity to visit Glasgow where I went by invitation of Dr.Alan MC Donald and Dr.Ann Blyth. We had a very interesting and full of events day together with Dr.McDonald. It was nice to follow step by step a routine work day of an experienced anaesthesiologist from the minute of arrival at the hospital till the end of the day. The same day we had a very nice evening in a cosy home mentality where I find a stretch of sternness and attraction too. I am proud that I had a chance to see Peebles, where Dr.McDonald was nominated this year president of the SSA of Anaesthetists.

The second day in Glasgow was very interesting and intense too, and Dr.Ann Blyth took care of it. This time I could see that it is still possible to combine our profession with children upbringing. I was really impressed by overwhelming energy of Dr.Blyth. Let this letter bring my admiration and best wishes to Ann Blyth.

My trip to Glasgow ended with an excursion to the future medicine. Here I mean Health Care International hospital. This visit was possible thanks to Dr.Pradeep Ramaya's kind cooperation. The HCI surprises with its modern facilities, advanced equipment and organisation which all put together proves usefulness of such hospitals.

It was not only medicine I learned about in Scotland. Trips from one city to another let me observe the rough nature of Scotland. Unforgettable was climbing Ben Lomond and looking at Scotland's views from a bird's eye. Getting familiar with your living environment enriched my impressions. So I am tempted to consider myself a rather good 'expert' of Scotland and Scottish life style.

Presently my native country undergoes cardinal changes after 50 years period of restricted independence and Latvia's violent incorporation into the USSR. The occupation brought big losses to the Latvian nation. In the result of 20th's century totalitarian regimes of Stalin and Hitler and the wide genocide they exercised during the years 1940-1949 Latvia lost 540,000 people which was 25% of country's population at that time. The demographical vacuum allowed for enormous immigration from the USSR and today only 52% of the population are native Latvians. And of course, through all these years we were strictly isolated from the rest of Europe. With this heavy historical burden on our shoulders we are now to strive for political and economic stability in the region, which in some parts of the world is still called 'Russia'.

By making this historical digression I wished to stress a need of cooperation between our countries. I am very certain that the project described in this letter can be considered as a great contribution towards Latvia's reintegration into Europe.

These were feelings and impressions from my stay in Scotland. It certainly was a tiny bit of all that has remained in my heart and memory from Scotland. My colleagues with who I shared my impressions also were very interested in what they heard. We all wish you success and look forward to cooperating with you in future.

Once again, I express my gratitude for your kind hospitality.

Sincerely yours,

Erks Sliders."





## TRAINEES MEETING, ABERDEEN, 9TH JUNE 1995

The Trainees was held this year in the Postgraduate Centre of Aberdeen Royal Infirmary. It was organised by Rob Carson and proved highly successful.



*Trainees Meeting Aberdeen 1995*

### UPDATE ON THE MANAGEMENT OF PATIENTS WITH SEPSIS AND SEPTIC SHOCK

*Prof. Nigel Webster, Aberdeen*

Sepsis and septic shock are the commonest causes of mortality on the Intensive Care Unit (ICU). An estimated 400,000 to 500,000 patients develop sepsis each year in European ICU's and some 50% of these demonstrate signs of shock. Sepsis often leads to multi-organ dysfunction (MODS) and failure with an associated high mortality rate. Of those patients developing septic shock some 50-60% will die despite optimum currently available treatment. The incidence of sepsis on the ICU is increasing. This is most likely due to our ability to sustain life due to better organ support techniques, as well as the more widespread use of invasive procedures in patients, more of which are now immunocompromised.

Largely driven by the requirements for drug research, various definitions of sepsis and shock have been developed. Most centres now use the criteria developed at a recent consensus meeting of the American Thoracic Society and the American Society of Critical Care Medicine.

- ◆ Infection is an inflammatory response to the presence of microorganisms or the invasion of normally sterile host tissue by those organisms.
- ◆ Bacteremia is the presence of viable bacteria in the blood.

- ◆ Septicaemia is a clinical term whose use is now discouraged.
- ◆ Sepsis is the systemic response to infection, manifested by two or more of the following conditions as a result of infection:
  - ◆ temperature  $>38^{\circ}\text{C}$  or  $<36^{\circ}\text{C}$
  - ◆ heart rate  $>90$  beats per minute
  - ◆ respiratory rate  $>20$  breaths per minute or a requirement for artificial ventilation
  - ◆ white blood cell count  $>12,000/\text{mm}^3$  or  $<4,000/\text{mm}^3$
- ◆ Severe sepsis is sepsis associated with organ dysfunction, hypoperfusion or hypotension.
- ◆ Septic shock is sepsis induced hypotension (systolic blood pressure  $<90\text{mmHg}$  or a requirement for vasoconstrictors, despite adequate fluid resuscitation).
- ◆ Multiple organ dysfunction syndrome (MODS) is the presence of altered organ function such that homeostasis cannot be maintained without intervention.

In addition, it is now appreciated that in many of the patients demonstrating all the signs of classical sepsis no source of infection is found. This condition is referred to as the Systemic Inflammatory Response Syndrome (SIRS). It is thought that this condition results when inflammatory mediators (probably identical to those found in bacteraemic patients) are released from ischaemic and infarcted tissue.

All the signs and symptoms of sepsis can be reproduced by the injection of endotoxin into human volunteers. These subjects display an increased heart rate and cardiac output with a fall in blood pressure due to vasodilation and a decreased  $\text{PaCO}_2$  and while arterial oxygenation is maintained initially the  $\text{PaO}_2$  eventually falls because of an increased alveolar to arterial oxygen gradient (A-a gradient) due to ventilation/perfusion mismatch. In addition there is an accumulation of oedema fluid because of increased capillary permeability. The endotoxin also causes changes in white blood cell and capillary endothelial function. A cascade of inflammatory mediators is released with the aim of activating and recruiting white cells to the affected region. It is against this inflammatory mediator cascade that most of the current research is directed to improve treatment options.

The most common initiating event is the release of bacterial toxins, either gram positive *exotoxins* or more commonly gram negative *endotoxins*. Toxins are shed by live bacteria but also may be liberated during cell



death as for example following antibiotic use. The cell wall of gram negative bacteria is coated with endotoxin which is made up of oligosaccharide side chains with a central core region onto which is bound a lipid portion known as lipid A. The structure of this lipid portion is conserved between species and it is this lipid which accounts for most of the toxicity of the endotoxin.

A number of cascades are triggered by the release of bacterial toxins. Firstly, the complex of LPS-antibody can activate the classical complement pathway, and it has been shown experimentally to activate the alternative pathway. Activated complement C3a and C5a lead to a series of inflammatory events, including platelet and granulocyte activation and changes in vascular permeability. Neutrophils then adhere to each other, and to the vascular endothelium. The release of oxygen-derived free radicals and arachidonic acid metabolites give rise to local tissue damage and further changes in vascular permeability. Secondly, endotoxin causes macrophage activation, potentiated by the presence of LPS binding protein (LBP) which presents it to specific receptors on the cell surface. The macrophage is then triggered to release a number of humoral mediators, including tumour necrosis factor (TNF), a series of interleukins (IL1, IL2 ... to currently IL15), and a variety of factors called chemokines which attract other inflammatory cells to the area.

#### IMMUNOTHERAPY

Early confusion over the use of high-dose steroids has been clarified recently and high dose corticosteroids are ineffective in reducing mortality. In the early 1980's a number of studies reported mixed results using pooled human immunoglobulins in the treatment of sepsis (IVIG). A genetically engineered antibody against the lipid A moiety of endotoxin was tested in the early 1990's but has since been shown to ineffectively bind to the endotoxin. Trials are currently ongoing with a range of monoclonal antibodies and cytokines including anti-TNF, TNF soluble receptor, IL1 receptor antagonist, IL6, IL10, LBP and BPI. The results of these trials are awaited in humans but many are very effective in animal models.



Nigel Webster



#### CLINICAL MANAGEMENT OF SEPSIS SYNDROME

*Dr. Marjory Macnab, Aberdeen*

For many years the pathophysiology of sepsis syndrome was poorly understood and there was little available in the way of successful management. However, several developments throughout the eighties and nineties mean that we can now view the future of this topic with optimism. Firstly came the publication of Shoemaker and then Edwards' work which suggested that manipulation of the cardiovascular system would improve survival in septic shock. Then there was the discovery and improved understanding of the cytokine cascades suggesting further new approaches to treatment. In response to these developments, in an effort to get more from research, a combined conference of the ACCP and SCCM in 1991 agreed definitions of varying degrees of sepsis.

The clinical management of severe sepsis/septic shock can be discussed under three headings.

#### 1. RESUSCITATION/SUPPORT OF CARDIOVASCULAR AND RESPIRATORY SYSTEMS.

In sepsis it is known that oxygen requirements increase by fifty per cent. Shoemaker and then Edwards both suggested 'certain therapeutic goals' that should be aimed for. Many workers have suggested alternative methods of attaining these goals, but only one paper by Hayes et al has suggested that attaining these goals might be detrimental to patient survival.

#### 2. DIAGNOSIS & TREATMENT OF SOURCE OF INFECTION.

This is very important to survival, as important as resuscitation. The source of infection must be found and identified with all speed and relevant antibiotics and/or surgery given. Without these steps the patient will die.

#### 3. NEW THERAPIES DIRECTED AT ATTENUATING MEDIATOR INDUCED SYSTEMIC RESPONSES.

These are just entering the clinical arena as clinical trials.

Finally, much attention has focused on the gut, mainly



because of the postulated theory of translocation of bacteria and endotoxin from the gut in low perfusion states, such as sepsis leading to a further fuelling of the septic process. Much work has been done on measuring gut pH as an indicator of severity of sepsis and the success of resuscitation. However, this has not yet become standard monitoring in most teaching hospital ICU's. However, early establishment of enteral feeding is now standard practice in most ICU's because of its role in maintaining gut mucosal integrity. Enteral nutrition may also attenuate the stress response in ICU patients and further clinical work is needed to ascertain whether specific nutrients can manipulate the immune response in man.

### TRACHEOBRONCHIAL STENTING

*Prof. J. Weir, Dept. Radiology, Aberdeen.*

Expandable metal stents are of proven value in major airway obstruction with stridor. Thirteen patients have been referred to the Department of Radiology for tracheobronchial stenting, 12 who had recurrent malignant disease. All patients had stridor. All 13 patients had Gianturco Z stents inserted under general anaesthesia. Pre-operative assessment was by computed tomography, bronchoscopy and when feasible from pulmonary tests. All the stents were introduced by one operator. All stents were correctly positioned. Continued stent expansion was noted on follow-up chest radiographs up to 10 days post stent insertion. The mean minimal bronchial diameter before stent placement was 5.3 mms increasing to 9.8 mms within 10 days of stent placement. The mean minimal tracheal diameter before stent placement was 9 mms, increasing to 13.5 mms within 10 days of stent placement. In at least 6 patients that survived for more than a month after stent insertion, there was a further increase in airway diameter of both the bronchial and tracheal levels. All but 2 patients had symptomatic improvement in their dyspnoea and stridor immediately post stent insertion. Simple pulmonary function tests (FEV 1, FVC) were performed before and after stent placement in 6 of the patients and although only 3

showed a significant increase post stent, symptomatically all patients were improved. Two patients, 1 with benign disease and 1 with recurrent malignancy, were alive and well eight months post stenting. The other 11 patients had died from between 4 days and 123 days from their recurrent malignant disease.

In conclusions, Gianturco Z stents increase airway diameter and reduce dyspnoea and stridor related to both benign and malignant major airway obstruction. The procedure is relatively simple to perform and no complications have been observed in our series.

### TRACHEA STENTING

*Dr. Rona Patey, Aberdeen*

Experience has been gained in this procedure during the last two years in Aberdeen. It has been performed as a palliative procedure for patients with advanced malignant disease in whom tracheal obstruction is a major problem.

A number of problems regularly face the anaesthetist for this procedure, in addition to the pathological process necessitating the surgery, i.e. large airway obstruction with stridor. In fact these patients are slowly asphyxiating. Other problems include limited respiratory reserve, general cachexia and dehydration. The procedure itself also presents problems. The already compromised airway is to be shared with the radiologist, and the procedure is performed in a site remote from the main theatre complex, i.e., the radiology department. This requires additional equipment and anaesthetic assistance be brought to the site of the procedure. It was after consideration of these problems that the following technique for providing anaesthesia developed in this centre.

Pre-operative assessment is performed with inspection of all body systems, in particular the function of the respiratory system. This is assessed by investigations such as CT scan, however much of the information comes from careful history taking and examination of the patient. A significant proportion of time is spent explaining the anaesthetic technique to the patient.

On arrival in theatre, monitoring and intravenous access is established and then the patient undergoes a gentle inhalational induction of anaesthesia. It is important this is performed in the position the patient finds most comfortable. This usually means sitting upright. The inhalational agent is carried in a Helium/Oxygen mixture. The trachea is intubated with at least a size 8.5 endotracheal tube, and the stenting procedure can then proceed. No muscle relaxants or adjuncts to anaesthesia are generally used. In fact once the trachea is intubated, the inspired concentration of inhalational agent may be quite low. Spontaneous respiration is maintained throughout. At the end of the 10-15 minute procedure anaesthesia is discontinued and the patient extubated on



*A Macdonald, President*



their side. Recovery from anaesthesia is generally swift and the patients return to the ward after around 30 minutes recovery.

Induction of anaesthesia is often prolonged, as a result of reduced minute ventilation. This is secondary to cachexia and compounded by airway obstruction, pulmonary disease, retention of secretions and significant ventilation/perfusion abnormalities. Turbulent flow is routinely the case in this group and so flow rate is dependent on gas density. There can be a significant reduction in the work of breathing if a gas of lower density is inhaled, hence the use of helium/oxygen in our technique. Even low concentrations of Helium may produce clinically significant improvements in ventilation. The paradoxical situation may exist that an improvement in the patients oxygenation can be achieved by a reduction in the  $FiO_2$ , with a concomitant increase in the inspired concentration of Helium.

These cases provide a significant change in an often unfamiliar setting. Both patient and equipment preparation, and good understanding and team work between the radiology and anaesthetic teams are essential.

#### **ADVANCES IN THORACIC ANAESTHESIA. USE OF THE FIBROSCOPE WITH DOUBLE-LUMEN ENDOBRONCHIAL TUBES**

*Dr. John W.W. Gothard, Royal Brompton Hospital, London.*



*Dr. John W.W. Gothard, Royal Brompton Hospital*

Sir Ivan Magill pioneered the use of endobronchial tubes in the United Kingdom and more importantly he advocated the direct-vision placement of these tubes using a rigid intubating bronchoscope.<sup>1</sup> The development of the fiberoptic bronchoscope now allows modern double-lumen endobronchial tubes to be placed under direct vision.

#### **DOUBLE-LUMEN ENDOBRONCHIAL TUBES**

Modern double-lumen endobronchial tubes are now made to a standard pattern similar to that of the Robertshaw tube<sup>2</sup>, which is an improved version of the tube Carlens originally used for differential bronchspirometry. Although endobronchial tubes are manufactured to a similar pattern the detail of their design can be quite different from make to make. One striking example of this is the different approaches to the design of the ventilation slot for the right upper lobe. In the large Robertshaw tube (Phoenix Medical, UK) the slot is 21 mm in length whereas in the 4IFG Bronchocath tube (Mallinckrodt Medical) it is only 11mm in length.

Double-lumen tubes have traditionally been placed into the larynx with the aid of a standard laryngoscope and then manoeuvred "blindly" into the appropriate main bronchus. The position of the tube is then checked clinically by auscultation and inspection of the chest and the "feel" of the reservoir bag. There is increasing evidence that these methods of checking the position of the tube are inaccurate<sup>3,4</sup>, particularly in relation to right-sided tubes<sup>5</sup>. Many clinicians now use the fiberoptic bronchoscope to check the position of double-lumen tubes within the tracheobronchial tree and in some cases place the tube under direct vision from the outset, as originally advocated by Magill<sup>6</sup>.

#### **INDICATORS FOR ENDOBRONCHIAL INTUBATION**

There are many indications for endobronchial intubation during thoracic surgery and these can, in theory, broadly be separated into "absolute" and "relative" categories as indicated in the table below. In practice thoracic surgeons in the UK expect the facility of one-lung anaesthesia for procedures in both categories so that it is usual to place a double-lumen tube for most of the procedures listed. If excision of significant amounts of lung tissue is involved surgically it is still the practice of UK anaesthetists to place a double-lumen tube in the contralateral side. A left-sided tube is preferred, however, if lung tissue is not to be excised, because of the relative ease of placement in the longer left main bronchus.

The development of a disposable endotracheal tube and bronchial blocker (Univent tube - Vitaid) provides an alternative to endobronchial intubation for certain procedures such as video-assisted transthoracic surgery<sup>7</sup>. The fiberoptic bronchoscope is ideally suited for placing the Univent tube but at present these disposable devices are more than twice the cost of a conventional endobronchial tube.

#### **INDICATIONS FOR ENDOBRONCHIAL INTUBATION**

<b>Absolute</b>	<b>Relative</b>
rupture / fistula bronchial tree	lung cysts?
bronchoplastic procedures (eg sleeve resection)	lung resection
lung transplant	oesophageal surgery
	cardio-thoracic surgery



videoscopic surgery  
massive bleeding  
profuse secretions  
lung cysts?

- aortic aneurysm
- coarctation
- shunt procedure?

#### USE OF THE FIBROSCOPE

Modern fiberoptic instruments designed for anaesthetic use are in a sense a combined laryngoscope and bronchoscope, hence the use of the term "fibrescope". The modern anaesthetic fibrescope is slim (3.8mm at tip), robust and relatively inexpensive. The Olympus LF-2 can be placed down tubes as small as the 35FG Bronchocath, assuming the internal plastic moulding is smooth, but will not pass down the small Robertshaw tube.

The fibrescope can be used to place a double-lumen tube directly in the appropriate bronchus initially, but more commonly it is used to check or reposition a tube after "blind" placement. Colour coding of the bronchial cuff (usually blue) is extremely useful when identifying the position of these tubes. It is only necessary to have knowledge of the main and lobar bronchi when using the fiberoptic instrument and therefore it is not a difficult technique to learn and can be self-taught. The sequence used to check the position of left and right-sided tubes is set out below.

Checking the position of double-lumen endobronchial tubes with the fibrescope.

#### Left-sided tube

1. check clinically
2. view tracheal lumen
  - right main bronchus clear?
  - blue bronchial cuff just visible?
  - cuff not herniating over carina?
3. view bronchial lumen
  - carina between left upper and lower lobes clear?
  - left upper lobe orifice clear?
4. adjust position if necessary
5. re-check tracheal side (right)

#### Right sided tube

1. check clinically
2. view tracheal lumen
  - left main bronchus clear?
  - just see blue bronchial cuff (not such a good guide with a right tube)
3. view bronchial lumen
  - check middle lobe orifice is unobstructed
  - locate ventilation slot in the tube
  - slot aligned with right upper lobe orifice?
4. manipulate position of tube?
5. re-check tracheal side (left)

6. re-check after positioning patient

*Note:* during steps 3 and 4 it may be decided to use a different size or make of double-lumen tube in order to optimise placement. Obviously it will be necessary to repeat the checking procedure for the new tube.

*A video presentation followed this lecture. This demonstrated the use of the fibrescope for placement of double-lumen tubes, a bronchial blocker (Fogarty catheter) and a single-lumen endobronchial tube in the presence of a bronchopleural fistula.*



Rob Carson





## SCIENTIFIC MEETING 17TH NOVEMBER 1995, EDINBURGH



The annual Scientific Meeting was held in Edinburgh at the Lister Postgraduate Institute. It was organised by Dr. David Scott and attracted one of the biggest attendances in recent years.

### DESFLURANE & SEVOFLURANE:

#### DON'T JUDGE THE PICTURE UNLESS YOU'VE EXAMINED THE NEGATIVES

*Dr. M. Logan, Royal Infirmary of Edinburgh*

With the introduction of new drugs into clinical anaesthetic use there is usually a period of expectation prior to its launch followed by an excitement phase when it is first used. After a few months this frequently leads on to a stage of disillusionment which eventually gives way to reconciliation when the drug finds its rightful place in our practice. The two new volatile agents Desflurane and Sevoflurane, being some two years apart in launch dates, should be at different phases of this natural sequence. Desflurane is ready to enter the reconciliation phase having shown early its Achilles heel of airway irritation and more recently it has been accused of carbon monoxide production in circle systems. Sevoflurane presented less traditionally having been administered to over three million Japanese before its release in Britain. Thus most of the answers to the uncertainties regarding Compound A, biometabolism and high plasma fluoride production are already available. This placed Sevoflurane into the early reconciliation phase almost before it was launched.

In the USA, seven cases of unexpectedly high levels of carbon monoxide within circle systems were reported (Lentz, 1994). Although no patient could be shown to come to harm from this, a series of laboratory studies were performed to investigate the potential for CO production (Fang and Eger, 1995). These confirmed that significant CO production was dependent on soda lime being virtually dry and hot simultaneously. The potential for CO production is related to the presence of a -CF<sub>2</sub> moiety in the volatile molecule allowing longitudinal electron transfer (Desflurane ≥ Enflurane > Isoflurane >> Halothane = Sevoflurane). In the labora-

tory it was possible to create conditions that produced such conditions as completely dry soda lime at 45°C can not occur in the Scottish climate as the same soda lime reaction needed to generate heat also generates moisture. Fresh soda lime contains approximately 15% water. If soda lime was allowed to dry out completely by passing dry fresh gas through the absorber over many hours it is possible to cause a room temperature reaction between soda lime and desflurane or enflurane. This could produce circle system CO levels likely to be equivalent to that inhaled by a patient smoking 20 cigarettes a day.

Approximately 15% of the sevoflurane in a circle system reacts with soda lime each hour to produce Compound A. This breakdown product has been investigated extensively and does not appear to possess significant pharmacological action or toxicity. It is metabolised by the action of B-lyase to produce reactive thiols. Tests in rats have demonstrated nephrotoxicity from these thiols (Anders 1990). However, humans have B-lyase activity approximately 100 times less than those in rats making nephrotoxicity from compound A very unlikely to occur. Nephrotoxicity caused by the 3-6% biometabolism rate of Sevoflurane was an initial worry because of plasma fluoride levels found occasionally to exceed the established 50 μmol l<sup>-1</sup> renal toxicity threshold determined with methoxyflurane (Cousins & Mazze 1973). Kharasch (1995) proposes that this threshold is misleading because methoxyflurane is significantly metabolised by several intrarenal cytochrome P450 routes resulting in high and damaging fluoride concentrations within the kidney. Plasma fluoride levels are therefore secondary to generation within the kidney and are subsequently lower. Sevoflurane, on the other hand, has very little intrarenal metabolism being mainly broken down in the liver by cytochrome 2E1. Thus, with sevoflurane, plasma fluoride levels temporarily exceeding 50 μmol l<sup>-1</sup> have little effect on the kidney. In addition, Sevoflurane causes a temporary rise in plasma fluoride lasting only a few hours. On the other hand, methoxyflurane causes a rise that lasts for several days which vastly prolongs the duration of the exposure of the kidney to high fluoride levels.

Both our new volatile agents, Desflurane and Sevoflurane, have been accused of possessing negative points. Such negatives always deserve close scrutiny. In these cases we are fortunate that the theoretical disadvantages have not been backed up by practical problems. We can look forward to the continued use of these excellent new agents without the worry of significant carbon monoxide generation or fluoride nephrotoxicity.



## CEREBRAL BLOOD FLOW IN LIVER DISEASE.

*Dr. Barbara Philips, Royal Infirmary Edinburgh*

The features of encephalopathy in chronic liver disease range from subtle behavioural changes to overt coma. The severity however correlates poorly with the actual degree of liver cell dysfunction. Greater correlation is found between the depth of encephalopathy and the extent of porto-systemic shunting. In fulminant hepatic failure the relationship between liver function and depth of encephalopathy is closer and the grade of encephalopathy (I- mild drowsiness to VI- unresponsive) is used in the criteria for selecting patients for urgent liver transplantation. The pathophysiology of encephalopathy is poorly understood. Studies of chronic liver disease have found global cerebral blood flow to be low, decreasing further as the depth of encephalopathy worsens. Regional blood flow studies have shown that cortical blood flow is particularly affected. Current consensus is that cerebral blood flow in patients with fulminant hepatic failure is also lower than normal but the studies are far from conclusive and hyperaemia has been observed. Raised intracranial pressure is common in patients in grade IV encephalopathy and these patients have a 40% risk of dying from cerebral complications.

In the Scottish Liver Transplant Unit we have been studying cerebral blood flow in patients with acute and chronic liver failure. The technique used for measuring global cerebral blood flow was modified from the Kety-Schmidt method based on the cerebral uptake of nitrous oxide.

### **Cerebral blood flow in patients with chronic liver disease undergoing elective liver transplantation.**

The liver transplant procedure is divided into three stages; the pre anhepatic stage, the anhepatic stage (veno-venous bypass) and reperfusion. Reperfusion is a period associated with marked changes in systemic haemodynamics (such as hypotension, increased cardiac output and decreased systemic vascular resistance). In patients with acute liver failure there may also be an increase in intracranial pressure which can be disastrous. We studied 15 patients with chronic liver disease to see whether reperfusion increases cerebral blood flow. The cerebral blood flow response to carbon dioxide was assessed in the pre anhepatic and reperfusion stages of transplant. Arterial carbon dioxide tensions were altered (within the range 3.5 kPa-6 kPa) by adding carbon dioxide to the breathing circuit. Ventilation parameters remained constant throughout the study. Carbon dioxide response curves were generated and cerebral blood flows were compared at PaCO<sub>2</sub> values of 4, 4.5, 5 and 6 kPa. The increase in cerebral blood flow at 4 kPa during reperfusion was statistically significant.

### **Cerebral blood flow in patients with fulminant**

### **hepatic failure.**

To date we have 74 cerebral blood flow determinations from 14 patients with fulminant hepatic failure. Thirty one of these determinations were obtained prior to study interventions and in 13 (42%) cerebral blood flow was normal (mean 52ml.100g<sup>-1</sup>min<sup>-1</sup>), in 5 (16%) CBF was less than 40 ml.100g<sup>-1</sup>min<sup>-1</sup> and in 13 (42%) CBF was greater than 70ml.100g<sup>-1</sup>min<sup>-1</sup>. Mannitol is the mainstay of therapy used for reducing intracranial pressure. In 7 patients cerebral blood flow was measured before and after treatment with 100 mls of 20% mannitol and fluid removal (500ml) by haemofiltration. Although the changes have not been found to be statistically significant, there does appear to be a trend emerging with mannitol being effective in decreasing intracranial pressure as cerebral blood flow increases.

## MULTI-MODALITY MONITORING FOLLOWING CRANIO-SPINAL TRAUMA

*Dr. P.J.D. Andrews, Western General Hospital, Edinburgh*

Autopsy evidence from patients dying as a result of traumatic brain injury has revealed a greater than 80% incidence of ischaemic brain damage concomitant with the traumatic lesion. This suggests a lack of oxygen and substrate delivery to the injured brain and is supported by Gentleman et al who noted that a combination of arterial hypotension and hypoxaemia on arrival at the neurosurgical centre was associated with a universally poor outcome.

With improvement in pre-hospital resuscitation and transport we must focus upon the intensive care management of these patients.

Cerebral perfusion pressure is the principal determinant of cerebral blood flow and is the mean arterial pressure minus the intracranial pressure. Cerebral blood flow is also affected by the arterial oxygen content (haemoglobin concentration and SpO<sub>2</sub>), arterial CO<sub>2</sub> tension (PaCO<sub>2</sub>) and cerebral metabolic rate for oxygen (CMRO<sub>2</sub>). Measurement of these cerebral oxygen delivery variables is therefore essential in the management of patients with traumatic brain injury.

Multi-modality monitoring following cranio-spinal trauma is aimed at the prevention of secondary ischaemic damage and promotion of neuronal survival. A multitude of factors affect cerebral blood flow and regional oxygen and substrate delivery and can be defined as intra-cranial and extra-cranial. Cranio-spinal trauma itself affects many of those factors. Thus, extra-cranial and intra-cranial haemodynamics, oxygen delivery and the acute phase response should be considered together and not as individual components.

Resuscitation, including multi-modality monitoring, of the patient following cranio-spinal injury should be

according to a protocol similar for all patients requiring resuscitation. A program of airway with cervical spine control, breathing and circulatory support are the priority before assessment and support of the neurological deficit.

#### **ANAESTHETIC AUDIT - DO IT RIGHT FIRST TIME.**

*Dr.N.H.Gordon, Western General Hospital, Edinburgh*

We each in our own way, deliver what we perceive as the best service for our patients. We have to work in a highly complex environment with many interactions and, despite our best intentions things do go wrong and the quality of care slips. The British car industry has been transformed by the injection of Japanese industrial philosophy 'Do it right first time and with the application of continuous quality improvement'. In the field of anaesthesia, preventing death is a poor yardstick of quality. We need to constantly review our performance and to raise the quality of care. Audit offers the means of doing this.

In the words of Juran, one of the gurus of the quality revolution, 'Quality does not happen by accident, it must be planned'. The King's Fund accreditation scheme is an attempt to define quality, but it is not easy to involve clinicians in its process. Audit should develop from the ground, upwards. Juran looked to worker groups which can examine the way they work together and the results they achieve and make the changes for the better. Crosby sees the role of management as identifying needs and supplying a system which allows the delivery of quality, 'Find out what the customer wants and then do it'. His performance standard is zero defects. Quality levels such as below average, average or good are self fulfilling and therefore fail to raise quality to the level the customer demands. Education and communication play a major part.

Apart from the patient, who are our customers in this quest for quality? Relatives are quick to judge our efforts and much depends on the adequacy of our explanations. The way we react to the staff with whom we work has an effect on the care patients receive. As trusts devolve budgets to directorates, we are expected to provide the best service for the available money. Purchasers are beginning to specify quality in contracts and will soon expect evidence of the levels of achievement. Postgraduate Deans will demand minimum standards of training for the secondment of trainees.

The role of audit in raising quality is in defining standards, measuring success and changing attitudes. The anaesthetic department is the level at which this will work best and this is especially true where openness is required for Critical Incident reporting.

The Lothian audit scheme has been halted through lack

of funding. It is easier now to see the weaknesses of the scheme. For its size, it was under-resourced. Many were uncertain of its purpose and even its relevance to their practice. The audit form was hardly user friendly and was tedious to fill in for short cases on a busy list, distracting from patient care. The supporting staff could not cope with the planned reports and could not deliver the necessary feedback.

From these lessons learned, it is important to have clear objectives. Departments should have control of audits and they should respond to their own reports. Data collection should be simple and offer the possibility of combining the audit and anaesthetic forms. Feedback should be reported in the ways preferred by each individual and each department.

Quality may be assessed as outcome, but more effectively by examining the system within which we work. The Scottish Surgical Mortality Study and Confidential Enquiry into Perioperative deaths audit the frequency of the ultimate outcome. They also look at the faults in the system which led to failure and in particular the part played by the interaction and communication of staff. If we work backwards examining the near misses at the earliest stage possible, we have the mechanism for Continuous Quality Improvement. All depends on the audit of Critical Incidents.

Critical Incident audit is a vital tool for quality improvement but the right climate must be fostered for it to work effectively. The process of quality improvement must be continuous. Customer standards are dynamic, not static and they must be recognised if changes to the system are to be made to keep up with them.

When we plan audits we must keep in mind the question 'How can the care of our patients be improved'. We should adopt the goal of successful industry 'How can WE do it right, FIRST time?'

#### **DOCTORS OF THE FUTURE**

*Professor A. Muir, Dean of Postgraduate Medical Education, South East Scotland.*

'It would be a charlatan, fool or knave who would predict the future'. These were the words the Dean of Postgraduate Medical Education in South East Scotland, Professor Sandy Muir used in addressing the meeting on his chosen topic of 'Doctors of the Future'.

Professor Muir touched on a range of qualities which the General Medical Council foresaw in our future doctors and which he fully endorsed. These included high standards of medical ethics, the ability to work in teams and the setting of clinical standards. He set out the need for communication, the failure of which resulted so often in patient complaints and the need for doctors to



be involved as much in promoting health care as treating it. Indeed, Professor Muir emphasised this with a comparison of his own bicycle chained up next to one of his colleagues Rolls Royce! As far as I am aware there are no scratches on either and both owners are in good health.

The bulk of Professor Muir's talk revolved around the need for continued medical education, (or continued professional development as put forward by the General Medical Council), the move towards a consultant based service and the introduction of the Specialist Registrar Grade. He emphasised the difference between a consultant led service and a consultant based service, and the importance of 'on-the-job training'. To precis his remarks, without a consultant led service there will be no doctors of the future, but that does not detract from the need for greater consultant input to primary and secondary health care. He explained many of the problems faced in introducing the Specialist Registrar Grade and the challenges this presented.

Professor Muir's opening remark was qualified with the statement 'it was up to us to decide which he was'. The meeting was left in no doubt that he was neither a charlatan, knave or fool.

#### CLINICAL EFFECTIVENESS

*Professor R.Kendal, Chief Scientist for Scotland*

Professor Kendal gave members of the society a clear overview of the role of CRAG in promoting 'Clinical

Effectiveness'. He outlined the structure of CRAG and the various bodies it related to, as well as emphasising its balanced membership with representatives from management, GP's, Hospital Specialists, Nurses, Pharmacists, Dentists and Local Health Councils. He went on to detail the functions of CRAG in promoting clinical audit, the production of clinical guidelines and finally clinical outcome indicators. He cited examples of clinical guidelines which had been produced including those on thrombolytic therapy, hormone replacement therapy, the management of depression in primary care and the management of peptic ulcer. The partnership of some of the Royal Colleges and CRAG, in the form of the Scottish Intercollegiate Guidelines Network (SIGN) was explained and its role in promoting 'evidence based' guidelines in clinical management were expanded upon. He put into perspective the media 'hype' of clinical outcome indicators and league tables, acknowledging the shortfalls in the interpretation of such data.

Throughout his talk Professor Kendal returned on several occasions to his main theme; the need to demonstrate value for money in clinical audit, the fact that guidelines based on a consensus view could not dictate treatment in the individual and that clinical outcome indicators were intended to encourage clinicians to ask questions they might not otherwise have asked.

Professor Kendal ended his talk by pointing out that the civil service was at least as bad, if not worse, than medicine in its use of acronyms. A point many members had long suspected!

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## NEWS FROM THE REGIONS

### GRAMPIAN

#### Aberdeen

Apart from the routine requests for 'efficiency savings' there has been no apparent signs of the well publicised financial difficulties of the Aberdeen Royal Hospitals NHS Trust. Demands on the service continue to grow, the Intensive Therapy Unit being under particular pressure with a regular 'overspill' into the Cardiac ITU and the theatre recovery area. The shortage of ITU beds, predicted in the design stage by medical staff, continues to be a cause of great concern, as does the difficulty in recruitment of consultant staff.

The transfer into the new theatre suite has been completed with the delayed movement of the ophthalmologists. A dedicated day surgery unit has been opened beside two of the old isolated theatres. Result, some of us return to the long trek up and down the corridor.

Brian Kennedy and George Robertson retired this year and we wish them well. The significant gap left by their departure has been partially filled by two part time consultants who bear a remarkable resemblance to their immediate predecessors.

Abdul Sheikh has been on a one year sabbatical to the King Fahad National Guard Hospital in Riyadh to develop anaesthetic services for hepatic surgery.

The academic department continues to expand under the direction of Professor Nigel Webster. Vivek Kullarni has returned from the British Antarctic Survey, and a year at the Shock Trauma Centre in Baltimore initially as senior registrar and latterly as Senior Lecturer. Helen Galley has joined as Lecturer and is now baffling us poor mortals with tales of the molecular basis of the systemic inflammatory response syndrome. Brian Cuthbertson is also carrying out research in the ITU with the aid of a grant from the Association of Anaesthetists of Great Britain and Ireland.

## Elgin

The new Dr.Gray's Hospital has opened in 1995. The hospital includes three fully equipped operating theatres and a new day stay facility.

Dr.Janet Tryhall, who is well known to colleagues in Inverness and Aberdeen, has been appointed as Associate Specialist. She will certainly not miss her journeys up and down the A96 from her Gordonstoun base. Dr.Colin McFarlane, complete with walking boots and expertise in percutaneous tracheostomy, moves from Edinburgh as senior registrar, to take up a consultant post this January.

## SOUTH EAST

### Borders

The controversial split in the hospital services did materialise, so the Borders General Hospital did become a Trust from April 1995. The pain clinic set up by Dr.Ian Yellowlees and Dr.Janet Braidwood is going from strength to strength.

Dr.Janet Wilkie, has been appointed Staff Grade Anaesthetist. From February 1996 the department joins the South East of Scotland SHO rotation.

### Edinburgh

Lothian has had more than its usual share of changes in the last year, although if future plans are to be believed these will be minor compared to developments up to and after the millenium. At the Royal Infirmary NHS Trust we are waiting patiently for the turning of the first sod at Little France to start the building of the New Royal Infirmary. The move before the year 2000 seems a little unlikely, but the common belief that we shall all retire from the old Royal Infirmary is probably unfounded. A new purpose built Day Surgery Unit is due to open at the present Royal Infirmary site later in 1996. Dr. Wildsmith completed his term as Clinical Director this year and has left to take up a new position and title in Dundee. Dr. Willie MacRae has replaced him as Clinical Director. David Swann has travelled from the other side of the Atlantic (accent unchanged) to take up a consultant position in the Intensive Care Unit with an interest in trauma and Simon Mackenzie has travelled from the other side of Princes Street to commence a consultant post in Intensive Care with a major interest in liver transplantation and the management of acute liver failure. Vicki Clark has taken up a consultant appointment with an increasing commitment to obstetric anaesthesia. Alastair Nimmo has flown back from Germany to contribute to both vascular and emergency anaesthesia. Dr. Carl Moores has been appointed to a substantive lecturer post in the Academic Department of Anaesthesia at the Royal Infirmary with

the appointment of Nikki Maran to a consultant position in the general anaesthetic pool. She has a developing interest in both acute and chronic pain management. Mike Soutar is a locum appointment, at present, in the other lecturer post. Gordon Drummond is still on sabbatical to Paris and is due to return to his Senior Lecturer post within the Department later this year. He remains in close contact by electronic means. Ellis Simon and Charles Morton are about to take up posts with an interest in thoracic anaesthesia. This service may move to the Royal Infirmary from the City Hospital this year if someone can find the space. Other changes at the City Hospital include the appointment of Dr. Robin Park with other sessional commitment to the Dental Hospital and the Princess Margaret Rose orthopaedic Hospital. Dr. Vaughan Martin is due to retire fully from his post at the City Hospital and Royal Infirmary this year, but is still single handedly undertaking clinical research projects in the Royal Infirmary at present. Dr. Geoff Bowler was appointed to the Working Party of the Research Council UK ALS Group in 1995. Children's' orthopaedic surgery has left the Princess Margaret Rose Hospital for the Royal Hospital for Sick Children taking with it David Simpson as Consultant Anaesthetist. Dr. Nigel Malcolm-Smith retains his interest in anaesthesia for the paediatric spinal service at the RHSC. Dr. Donald Grubb retired at the time of these changes, but his immediate plans can hardly be regarded as retirement. Between trips to Hawaii he will contribute to "filling in the gap?" at the RHSC and is very active with many outdoor pursuits.

The Western General Hospital has the appearance of a high rise building site in 1995 with more to come. Dr. David Wright has retired from the post of Clinical Director and is replaced by Dr. Ian Levack. Dr. Jim Jenkinson has been appointed as President of the Neuroanaesthesia Society of Great Britain and Ireland. Margaret Cullen has returned from maternity leave following the arrival of her baby son and Susan Midgely is replacing her in that part of the rotation. Dr. Dick Burtles has retired from clinical anaesthesia at the Western where he has provided invaluable sessional help for a period of some ten years following his first retirement from the RHSC. In his further retirement he takes up his new post as clinical auditor at the Western General. Dr. Charles Wallis has been newly appointed to a consultant position in the Intensive care Unit. Ian Grant takes up the reins as President of the Scottish Intensive Care Society in 1996.

At the Eastern General Hospital Alistair MacKenzie has been appointed to a consultant post and Agnes Delvaux (welcome back again) has taken up a part time substantive and part time locum consultant position. Dr. Brian Slawson is active in retirement, working part time at the Eastern General, following his recent retiral from the Western General Hospital.

At the Royal Hospital for Sick Children major changes



have occurred with the opening of the newly built Intensive Care Unit in June 1995. Dr. David Simpson is in control. Dr. Louise Wilson, a paediatrician/ITU specialist and Julie Freeman have been newly appointed to further this development. Dr. Eddie Doyle progressed from a lecturer post within the Royal Infirmary to take up a general consultant post in anaesthesia at the beginning of 1996.

At St.John's Hospital, Howden Dr. Sally Edwards has resigned and is moving to London. She has been replaced as Clinical Director by Donald Galloway. Fiona Annan has moved to a Staff Grade position at Dunfermline. Colin Small is active in retirement at St. John's and is also President of the Edinburgh and East of Scotland Society of Anaesthetists which is celebrating its 50th year of existence. Dr. Arabelle Dickson, recently on sabbatical from Christchurch New Zealand, has returned home and Mike Brockway is due to return from Kiwiland shortly.

The effects of Calman and junior hours have been felt in Lothian as elsewhere, but there now appears to be some greater clarity as to the future.

#### FIFE

Since Dr.Eve Pitt retired from Queen Margaret Hospital, Dunfermline, Dr.Keith Birkinshaw has taken over completely running the pain clinic. Dr.Sami Fouad unfortunately left the department after many years service, for family reasons, to go to Wakefield. Dr.Susanne Boyce, Clinical Assistant, who worked primarily in Community Dental Anaesthesia, has left to practise full time in general practice. Dr.Ruth Cruickshank replaces her. Dr.Fiona Annan, well known in the Edinburgh area, has been appointed part time Staff Anaesthetist from February 1996. The Enhanced High Dependency Unit has been upgraded to a full Intensive Care Unit and has the facilities for dialysis and haemofiltration supported by a Renal Physician.

In Kirkcaldy, Dr.Callan Wilson has increased his responsibilities as Clinical Director for Theatres and Anaesthesia to include Surgery. We therefore expect to see firm control over our surgical colleagues!

Dr.Jena was appointed consultant in February but for family reasons had to resign within nine months. However, Dr.Ian Smit became a substantive member, having been a locum consultant for several months. After many years in anaesthetic practice in South Africa, Ian set sail from Cape Town in his 35 foot yacht with his wife and family. En route he recruited an additional crew member on St.Helena where his daughter gave birth to Helena. This ensured a safe journey to Falmouth!

Having increased the consultant input to the obstetric service at Forth Park, we were delighted to be able to

appoint Dr.Arthur Davis who has a special interest in this field. Accusations of head hunting Arthur from his well established position at the Southern General Hospital, Glasgow, are utterly refuted.

Facilities for intensive care and day surgery at the Victoria are currently being improved as part of a major £5.6 million upgrading programme. Inevitably this means a continuous feeling of working on a building site. A worrying development is the Management Executive's decision to put out to tender the management of the hospital services in North East Fife, along with the construction of a new community hospital in St.Andrews involving private finance.

#### TAYSIDE

##### Dundee

Following the major changes reported last year in Dundee, 1995 has been more a year of consolidation.

Tony Wildsmith arrived as Foundation Professor in April and has busily been establishing his Department and raising the profile of Anaesthesia within the Medical School. The siting of the new Academic Base is still to be decided definitively (the Professor is in his third office and the builders are expected any day), but a secretary and research nurse have been appointed along with a Clinical Lecturer - Matthew Checketts from Glasgow. Susan Rae has taken up a two year research fellowship and Trust funding is available for a Senior Lecturer; interested parties should contact the Professor.

Bill Bisset retired earlier this year after many years of service to the specialty both at local and national level. He was instrumental in setting up the anaesthetic nurse and chronic pain service in Dundee and made major contributions to neuro and dental anaesthesia. We wish him all the best in his well merited retirement.

Three new consultants were appointed. Grant Rodney from Cardiff with a paediatric and acute pain interest and Graeme McLeod and Fergus Millar from our SR ranks, the first with an obstetric interest and the second with trauma and regional anaesthesia expertise. Internal reorganisation has seen Ian Gray finally relinquish his intensive care commitment which has been taken up by Sally Crofts. Praveen Manthri assumes major responsibility for neuroanaesthesia.

There has been less movement than usual at senior or career registrar level as trainees await the implementation of Calman in April, although Charles Wallis and Sandy Binning are both about to depart for consultant posts with an intensive care interest at the Western General in Edinburgh and the Western Infirmary in Glasgow respectively.

Intensivists will be interested to hear that Ian

Ledingham has returned from the Middle East to become Director of the newly established Undergraduate Skills Centre in the Medical School.

## **Perth**

The Anaesthetic Department has continued to expand in 1995 with the arrival of Dr. Mike Bell in January, and during the year funding was approved for a ninth consultant post which we are hopeful of filling in 1996. After several years of waiting, the department has now acquired offices alongside the new theatre block; these have enough space to accommodate all members of the directorate.

Dr. Andrew Kutarski has held the post of Clinical Director for the past three years and has now handed this to Dr. Peter Coe who has been his deputy over this time. This will allow Dr. Kutarski to spend more time developing his Chronic Pain Service at the hospital. The Day Surgery Unit had its official opening this summer and activity is increasing as surgeons gain more confidence in this type of work.

## **WEST OF SCOTLAND**

### **Glasgow**

Greater Glasgow Health Board has decided its Acute Services Strategy for the period 1996 to 2000. The Strategy is one of minimal change and in many ways echoes Mr. McCawber's philosophy that something will turn up. There remain considerable doubts as to the long term financial viability of this strategy. Greater Glasgow Health Board has still not implemented certain key elements of its 1990 to 1995 strategy such as building a new Royal Maternity Hospital.

The Health Care International Hospital at Clydebank continues to operate. It now has the financial backing of the Abu Dhabi government and has been picking up a number of contracts around the Middle East as well as a number of National Health Service waiting list initiatives.

I am sure that members of the Society were dismayed to hear that Donald Campbell was acutely ill last year but we were all very relieved and happy to see him at the Peebles Meeting. At the time of writing, Glasgow University had still not made an appointment to fill the Chair in Anaesthesia created by Donald's retirement.

### **Glasgow Royal Infirmary**

The Royal Infirmary has now survived its first year as an NHS Trust and is still apparently financially viable. Indeed, a considerable amount of capital investment has come the way of the Directorate over the last twelve months. The Intensive Care Unit has been upgraded to a high standard which has produced a much more pleas-

ant environment for all the staff in the Unit. In addition, the Trust Board has provided funds to set up a long overdue Acute Pain Service which is already offering major benefits to a significant number of our patients. As in all hospitals an increasing service for day case surgery which, even in the East End of Glasgow is very popular with patients who seem to be able to return to the Bingo Hall almost as soon as they regain consciousness!

On the staffing front we have appointed one new consultant during the last year, namely Dr. Malcolm Booth, who has a special interest in Intensive Care. However, our senior registrar establishment has undergone an almost complete replacement with Drs. A. Davidson, C. Dryden, D. Russell, D. Swann and C. Taylor departing for pastures new. Needless to say there has been a vast influx of new faces and we welcome Drs. J. Booth, M. Daniel, G. Fletcher, M. Higgins, R. Jackson, K. James, M. Mansfield, G. Oommen, D. Robinson and E. Smith.

Finally, perhaps the most significant big money transfer to take place in Scotland this year has been completed within the Royal Infirmary, with the move of our previous Clinical Director, Dr. W.G. Anderson to the position of Medical Director of the Trust for an undisclosed fee. At the time of writing, a successor as Clinical Director has not been appointed.

### **Royal Hospital for Sick Children, Glasgow**

Dr. Andrew Wolf left the department for a consultant post in Bristol. Andrew was with us, what for him was a protracted time, of three years. He has been replaced for one year by Dr. Tom Hansen from Odense in Denmark. Both have an interest in abolishing the stress response in neonates but unfortunately this expertise does not seem to be transferable to the Clinical Director!

The department has established an acute pain service following the appointment of a nurse specialist funded by a two year grant from the Scottish Office under the Novel Health Department Scheme.

We have been fortunate to have foreign senior registrars visiting us for periods with Michael Crawford from Aberdeen, Damien Carson from Dundee and Sue Tan from Newcastle. At long last, we have been able to advertise two posts at senior registrar level for a period of one year each to provide experience in paediatric cardiac and neuroanaesthesia.

The prospect of new operating theatres hangs tantalisingly in the balance!

Several members of the department have been contributing extensively to the literature and a successful book on Paediatric Day Surgery has been published under the editorship of Dr. Neil Morton and Mr. Peter Raine. This celebrates the fact that it has taken 90 years



to reach the day case figures which Mr. James Nicol achieved at the start of the century.

### **Southern General Hospital**

The Anaesthetic Directorate took over responsibilities for management of theatres in April 1995 and a new Nurse Manager and Business Manager have been appointed. The Trust seems set for an uneventful year but it seems the next few years will be extremely difficult as Glasgow reaches share parity and the Glasgow population continues to fall.

On the staff side, Dr. Margaret Gibbon has taken early retirement from her associate specialist post and in due course her post will be replaced with a consultant post. Dr. Colette Clark has moved to Auckland where her husband, Kenny, has obtained a consultant post in Respiratory Medicine and Intensive Care. Colette has had another baby and we wish all of them good fortune in their new home. Dr. John Dickson arrived in June to take up a consultant post in Intensive Care from being a senior registrar in Newcastle and moved on to the Royal Alexandra Hospital in Paisley at the beginning of September. Dr. Arthur Davis has continued the exodus and he is moving to take up a consultant appointment at the Victoria Hospital in Kirkcaldy as of the 1st January 1996. Arthur's move is occasioned by the fact that his wife, Barbara, has taken up a consultant post with the Scottish Office in Edinburgh. Arthur's contribution as Chief of Obstetric Anaesthesia and as Tutor will be greatly missed.

On the positive side, Douglas Russell joined the department as a consultant at the beginning of August having been a senior registrar at Glasgow Royal Infirmary. He has not as yet notified his wish to leave! Jennifer Walker joined the department as a senior registrar in October. This was one of a number funded by the Scottish Office in an effort to ease the man-power problems in anaesthesia.

The Department of Neuroanaesthesia remains part of the Directorate of Neurosciences. No major changes have occurred in the last year, but plans are being made for an increase in services which are anticipated to start in 1996. These include an increase in the amount of anaesthesia for imaging, particularly of children, and the provision of carotid artery surgery. Dr. Robin Duckworth has increased his part time commitment to this department, while at the same time resigning from his commitment to the Western Infirmary. The changes in the hours of work of trainees has resulted in funds to provide for a new full time consultant to the department. It is hoped to fill this post in early 1996. During this last year we have received several overseas visitors who wish to increase their knowledge of the management of head injuries. The department continues to play an active role in the research involved in the management of these patients.

### **Stobhill**

Dr. Stuart Macdonald has taken early retirement but

hopes to continue on a part time basis! He has been replaced by Dr. Walsh. Dr. David Aylmer takes up a consultant post to replace Bill Doherty. A first for some years, is the arrival of a new senior registrar, Dr. Bill Macrae.

We have a new Chief Executive, Mr. David Sillito, enticed away from the Royal Infirmary of Edinburgh. One of his first moves is to promise to build a new Intensive Therapy Unit!

*(Remember the new RIE - ed)*

### **Victoria Infirmary**

To be quite frank, absolutely nothing has happened! Alan Brown and Alan Davidson are now firmly established as our newest consultants, one in the Obstetric Unit and the other in the Intensive Care Unit. We have seen an increase in our senior registrar complement from five to six and one of our senior registrars, Ian Taylor has taken up a consultant post in the new Ayr Hospital.

Robin Marshall has assumed the position of Regional Advisor and Ronnie Glavin is now the Deputy Regional Advisor. Alan Davidson takes over as College Tutor

The hospital continues to struggle financially, but by virtue of savings in our budget, we have managed to appoint a full time Pain Sister and an Acute Pain Service will be underway by the end of the year.

*(Well perhaps a few things have happened - ed.)*

### **Western Infirmary**

The most important development in this last year has been the relocation of the Anaesthetic Department from the architects hut in front of the Western Infirmary to the former Nurses Training College situated on the old University Place. Dr. Ashbury and the University Department of Anaesthesia have moved into part of the ground floor and the NHS Department occupies most of the upper floor. The old department was very cramped with inadequate space for secretaries, desks, study and tutorial rooms and so on. These deficiencies have now been remedied. The only problem has been the coded security alarm system which has come close to causing heart attacks in some of the older consultants who forgot to switch it off on entering the department in the evenings or at weekends.

There have been no consultant appointments within the department over the last year. At senior registrar level Dr. Sarah Lloyd took up a consultant post in Leeds in April 1995. Drs. Hamid and Lawson took up posts in Canada and the USA. Drs. Donnelly and Brydon were appointed senior registrars within the department in January and February of 1995 and Drs. Ingram, Marshall and Jackson in June of 1995. Drs. MacKenzie and McGinn undertook their own transfer from the 'Shock Team' to senior registrar posts and were joined later by Drs. Hawksworth and Forster.

# SCOTTISH SOCIETY OF ANAESTHETISTS GOLF OUTING KILLERMONT, 16TH JUNE 1995

## PRESIDENT IN SENSATIONAL NEAR-MISS SSA GOLFING CORRESPONDENT



*There he goes!*

Twenty four members of the Society, from Dumfries, Aberdeen, Dundee, Edinburgh, Falkirk, Ayrshire and Glasgow assembled at The Glasgow Golf Club for the Annual Golf Outing, on a cool cloudy day. The first cool day following a brief heat wave. Fortified by coffee and bacon rolls, they competed in a stableford competition for the Scott Trophy in the morning. The standard was commendably high, with nine scores of 36 points or more. The winner was Charles Cairns, with 42 points, one more than Nick Pace, who in turn, was one ahead of David Marsh and Ron Meek. Brian Maule excelled by scoring 23 points on the first nine, but then self-destructed with an exciting but terminal attack of hooks.

Soup and sandwiches in the Council Room was followed by the Grand Challenge Match, East versus West. To even up the numbers, Alastair Spence, the non-play-

ing, but highly motivating Captain of the East team, drew two names from the hat containing names of the West team. Totally unfounded allegations followed the drawing of the West's two most dependable members:- the most senior Alick Reid, the only local member who not only had local knowledge of the course, but also had insider information of the pin positions, and the most junior and athletic member, Guy Fletcher. As fate would inevitably predict, neither of them found their form and both fell victim to their colleagues from the West. A steward's enquiry failed to substantiate the suggestion of doping. After a sporty and spirited contest, the result of these fourball games was a close win for the East by 3 1/2 matches to 2 1/2 matches.

One of the highlights of the day was the sensational near - assassination of the President. While quietly going through his pre-shot routine for a pitch from the rough at the sixth hole, he was nearly the victim of a thinned head-high drive from one of his own hospital colleagues playing off the next tee. If he had not already had his head well down in exemplary Leadbetter fashion, it might well have been down for keeps. So shaken was he after this, he holed his pitch!

The uninhibited, non-playing captain of the East team, displayed enormous photographic prowess on and off the course. However, he might well have been shown the red card for excessive flashing and his comment on the personal feelings of his camera towards him as its lens unexpectedly zoomed out! A very successful Outing was enjoyed by all on one of the finest parkland courses in Scotland. The days activities were brought to a close with a delicious dinner in the dining room of the stately Clubhouse, in the most convivial company.



*What do you mean - replace the divot!*





### **North East of Scotland Society of Anaesthetists**

*(Honorary Secretary - Dr.E.Wilson, Ninewells Hospital, Dundee)*

- Oct. 5th Paediatric anaesthesia and pain relief: Safety issues  
Dr. N.S. Morton
- Nov. 2nd Anaphylaxis in Anaesthesia  
Prof. J.A.W. Wildsmith
- Dec. 8th Norman Rollason Lecture  
Dr. J.E. Charlton
- Feb 1st Management of Acute Liver Failure  
Dr. A. Lee
- Mar. 7th Trainee Prize Papers and Annual General Meeting
- Apr. 4th Reading of Prize Winning Essay  
Presidential Address: Dr. P.B. Taylor

### **Glasgow and West of Scotland Society of Anaesthetists**

*(Honorary Secretary Dr.T.Goudie, Royal Alexandra Hospital, Paisley)*

- Nov. 3rd Combined Meeting with Edinburgh & East of Scotland Society of Anaesthetists  
(in Glasgow)  
"Who gets treatment - legal and ethical issues"  
Prof. S. McLean, University of Glasgow
- Nov. 20th "Is the difficult airway extinct?"  
Dr. I. Calder, National Hospital for Nervous Diseases, London
- Dec. 13th Combined Meeting with Glasgow Anaesthetic Research Club
- Jan. 15th Members Night, Inverclyde Royal Hospital, Greenock
- Feb. 13th "Systems of Trauma Care"  
Dr. A. McGowan, St.James Hospital, Leeds
- Mar. 5th "History and Heroes"  
Presidential Address: Dr. D.F. Steel
- Apr. 23rd Annual General Meeting
- Jun. 6th Golf Outing to Paisley Golf Club.

### **Edinburgh and East of Scotland Society of Anaesthetists**

*(Honorary Secretary Dr. G. Jones, Eastern General Hospital, Edinburgh)*

- Oct. 10th "Some Medical Aspects of Diving"  
Surgeon Commander J.J.W. Sykes, Gosport
- Nov. 3rd Joint Meeting with Glasgow and West of Scotland Society of Anaesthetists (Glasgow)
- Dec. 12th "Quality in Health Care"  
Dr.W.Nimmo, Inveresk Clinical Research
- Jan. 9th "LMA's Past, Present and Future"  
Dr. A.I.J. Brain, Reading
- Feb. 6th Presidential Address Dr. C. Small
- Mar. 5th Members Night
- Mar. 23rd Annual Dinner
- May 5th **Annual General Meeting**

## TRAINEE'S PRIZE

The Society annually awards a prize of £250 for the best original essay submitted by a trainee anaesthetist in Scotland. A second and third prize may also be awarded for papers of particular merit at the discretion of the assessors. It is not necessary that entrants be members of the Society.

The conditions attaching to the award are as follows:

The paper or essay should be original i.e. it should not have been read previously at any meeting or published in any journal.

It is desirable that entries show evidence of personal work, but surveys of the literature are eligible for consideration. The Council of the Society wishes to stress that intending contenders should not be discouraged through fear of their efforts being judged elementary. It is fully realised that trainees in some peripheral hospitals may not have opportunities to deal with special types of cases or

employ advanced anaesthetic techniques.

Four Copies of each entry **MUST** reach the Honorary Secretary by the end of February.

The Hon Secretary places all entries in the hands of the Awards Committee which consists of the President, Vice-President and Past-President. These individuals wish to adjudicate without knowing the name or the hospital of the entrant; it is therefore requested that these details be submitted on a separate covering page and that the essay itself give no indication of its source. Acknowledgements to named colleagues should not be included.

The winner of the prize will be required to give a digest of the paper at the Annual Trainees Meeting in June. His/her expenses for the Annual General Meeting at Peebles and those of a partner will be met by the Society.

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