

June Newsletter 1999

Council for the Society for Medical and Biological Engineering (SA) Inc 1998/1999

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As you can see above we now have a new web address. I am not sure what this means but those who know more about the internet than I do will be aware of the advantages. Many thanks must go to John Kirby for his considerable time and effort in producing our web site.

The AGM is imminent but a firm date cannot be given until we have secured the guest speaker. Our constitution gives us 5 months from the start of the financial year to have the AGM. However be assured that the guest speaker will be worth the wait. We are continuing our policy of having a topic that is not related to our everyday work. We will give as much notice as possible of the date and venue, but it will not be less than 2 weeks.

This year the positions of Vice President, Treasurer and 3 councillor positions will become vacant. A nomination form can be found at the end of this newsletter. The Secretary must receive nominations by COB on 23 July 1999.

Please give serious consideration to being on the council as you will find it very rewarding.

Editor.

President's report.

The old adage used to go something along the lines of "There are only two certainties in life - death and taxes" It is however getting close to the point where we need to add "or takeover by a large international corporation"!!

The moves within the technology supply and support industry has been nothing short of staggering of late with the promise of more, in fact much more, to come. We initially saw mergers (and distinguishing between mergers and takeovers is becoming increasingly difficult), between imaging giants like Sterling/Agfa and Kodak/Imation This was followed by GE/Diasonics, GE/Marquette, Philips/ATL Ultrasound, Medtronic/Physio Control and so the list goes on. Closer to home we have seen the three significant "home grown " private providers of Biomedical services go under the hammer and one by one be sold off to larger interests. Sydney based SC Medical and East Coast Medical went to GE and Drager respectively whilst Victoria's Chemtronics (the countries largest) was sold just a few months back also. I could confidently predict that this trend will continue and that within the next year we will see "household names" within the medical equipment industry here in Australia either disappear or take on a significantly different appearance.

I must also clarify some comments made within my report within the last newsletter on the topic of non performance of acceptance testing on medical equipment prior to placing it into routine use. This is indeed a bold practice for any that may choose to adopt it for the reasons outlined previously. However members should not deduce that my general comments pointed at any particular institution here in Adelaide, they should draw their own conclusions based upon fact.

Adrian Richards

EAust Biomedical Engineering Development Workshop

Last year, immediately prior to the EPSM'98 conference in Hobart, the College of Biomedical Engineering within IEAust trialed the concept of a development workshop for emerging practitioners within Clinical Engineering. It was considered a resounding success and so a similar exercise is being organised for the two day period leading into EPSM'99.

This workshop is intended for practitioners at either the professional or technical level who could benefit from an introduction to or consolidation of their Clinical Engineering expertise. It is not an instructional forum but rather one in which group participation is intended to mutually benefit all. Participants are required to select a topic from a provided list and prepare a presentation of approximately 15 minutes duration. This will then flow into a group discussion in which a number of attending experienced practitioners will be involved.

All costs associated with the actual workshop itself will be met by IEAust. As it will be held nearby to the EPSM99 conference on the Gold Coast the participant or their employer must meet travel costs and it is anticipated that, to maximise and consolidate benefits, people will stay on for the conference itself.

This is an extremely effective means of forming or refreshing ones expertise, if you or any of your colleagues (IEAust or SMBE membership is not required) would like further information please contact Adrian Richards.

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In the last newsletter I mentioned a proposed award for appropriate articles published in the newsletter. What I forgot to mention was that this award was proposed by and is being sponsored by Drager Australia. The Council wishes to thank Drager for their generosity and support for the Biomedical Engineering profession.

Entry and nomination details will be provided in a future newsletter.

Details of the award follow.

The SMBE (SA)/DRAGER Biomedical Engineering Encouragement Award

PHILOSOPHY

This annual award is to be made as a means of acknowledging and encouraging excellence amongst Biomedical Engineering practitioners.

PROCESS

The recipient shall be selected by the council of the SMBE (SA) and a representative of Drager Australia from amongst candidates who shall:

Be nominated by a peer who deems them worthy of such recognition

Author a short technical or topical article on a subject either nominated by themselves or chosen from a list provided by the council for publication in it's newsletter.

Either of these may precede the other but both must be fulfilled to be eligible.

THE AWARD

The award shall comprise a funded visit to the annual SMBE (NSW) technicians seminar.

CONDITIONS

Open to all BME practitioners, from within SA and the NT, be they SMBE members or not.

The recipient must be in a position to attend the seminar, in either their own or employers time. The award may be forfeited if this requirement cannot be fulfilled.

The nomination by a peer must give a clear indication or evidence of the nominees abilities, skills, motivation or commitment that, in their mind, sets them apart and makes them deserving of particular recognition.

Individuals holding position of the council of the SMBE (SA) at the time of judging are ineligible for consideration.

All entrants are eligible for minor awards of complimentary SMBE (SA) membership for a one year period.

The SMBE (SA) council reserves the right to not make the award whether the submitted articles have been published or not.

Report on meeting

Dr Colin Carati, School of Medicine, Flinders University of SA.

Dr Colin Carati was presented to us, as you may recall, as an academic and researcher with an incurable tinkering habit resulting in the need to regularly seek therapy with his local Biomedical Engineer!!! This was indeed confirmed by his entertaining, informative and thought provoking presentation.

He described himself as having a particular interest in the cardiovascular system with a special leaning towards it's often neglected component, the lymphatic system. He in fact gave us a good insight into both, along with the interstitial tissue that separates and interacts with them both.

Extending beyond his high school physics upbringing and its definition of pressure being force divided by area, his studies have led him into the investigation of other pressures that can be measured in moving fluids such as blood. Blood pressure indeed can also be considered to comprise a kinetic energy component due to its flow and a lateral

component which exerts force on vessel walls. The two are interrelated with energy being proportional to the square of the velocity. Hence as vessel diameter reduces and flow increases the laws of energy preservation dictate that the lateral component reduces drastically. It is often this lateral component which is measured externally, so we need to be aware of this diameter/velocity relationship coming into play. One example of this phenomenon was quoted as being the case of vascular disease affecting the ascending aorta in the vicinity of the coronary sinus from where blood is supplied to the coronary vessels. Hardening or reduced diameter of the aorta will increase flow, seriously reducing lateral pressure and hence flow to the coronary arteries exacerbating the primary disease.

Reflected waves within the arterial tree were also described as the topic of current research. The pressure waveform measured at any point is the sum of the advancing pressure wave and the interference with reflected wavefronts. By measuring waveforms at selected points techniques are emerging which allow conclusions to be drawn on the condition of the circulatory system both upstream and downstream from the measurement point. The waves interfere most significantly, resulting in a high-pressure zone, in an area slightly above the femoral bifurcation, not coincidentally a common site for aneurysms to occur.

The important but often overlooked role of the lymphatic system was also highlighted. It manages to effectively transport up to 10 litres of fluid per day recycling it back into the venous system. We learned about a measurement technique, developed in conjunction with Biomedical Engineers at Flinders University, utilising a micropipette that could be introduced within a lymphatic vessel enabling measurement of the pressure within it. This managed to dispel the common belief that transport through this system was by way of adjacent blood vessels "massaging" the lymphatic vessels. A distinct pulse, generated by wall contraction, could in fact be measured peaking at up to 35 mmHg in some instances. The waveform could also be indicative of the state of the system, with fluid loading of tissue upstream causing a rise in the baseline pressure and rounding of the peaks indicating blockages or flow problems upstream.

The role of another form of pressure was also introduced, being osmotic pressure across vessel and cell walls. Due to relative differences in ionic concentration, fluids are actually drawn from the interstitial tissues into the CV system, effectively leaving this in a negative pressure state. This

has been measured at around -1mmHg. Insult to this tissue, the example of a burn being quoted, radically affects this with it dropping to as low as -100mmHg within 5 secs. This explains the formation of a blister, containing almost pure lymph, as this negative osmotic pressure draws the fluid from the CV system. Swelling after injury was another example quoted, the situation resulting from loading of tissue in this manner which cannot subsequently be removed quickly enough by the low flow lymphatic transport mechanism.

All in all a fascinating insight into an area of which many of us have a general understanding, but into which Dr Carati provided much enlightening detail in a very easily digestible form.

Adrian Richards

REPORT ON MEETING HELD 27TH MAY

EDS MARKETSPACES TOUR, PETER MATHEWS

It seems that this tour created a lot of interest, especially after the large number of responses that I received (more than 50 in fact). Unfortunately we had to limit numbers to 30 due to space limitations.

Peter Mathews and Carol Booth conducted the tour through Marketspaces. The first stop on the tour was the IMC (Information Management Centre). This Centre is the second largest of its type in the EDS world. The largest is situated at EDS's head office in Plano, Texas. The IMC currently monitors the SA Government network and constantly monitors the load on Nine's MSN website. The versatility of this centre is enormous. If required they would be able to monitor Holland's water levels, which is a project of EDS Holland. As for the dreaded acronym Y2K, this centre will be fully manned at the turn of the century, as Australia will experience any possible problems before many other countries. So we will be used as 'guinea pigs' to pre-warn others such as the USA as to what has occurred.

The next part of the tour was held around various displays that have been set up to showcase the abilities of EDS. Two exhibits that really stood out was the Bell Communications VR town and the General Motors 'Onstar' system.

The VR town was developed for Bell to streamline their training programs for their technicians in the field. The program perfectly details a typical town down to street numbers and lamp posts, and enables the technicians to navigate around the town to individual termination points to troubleshoot and repair faults, giving safety tips along the way.

The 'Onstar' system is a motor vehicle management system that is installed in GM vehicles as an option and uses GPS. If a vehicle is broken into, a customer service operator is notified immediately who then notifies the owner that this has occurred, and with the GPS can follow the vehicle and directs the police for recovery. The same occurs for a crash, as they monitor deployment of the airbag.

This system has been extremely popular and Peter suggests that it may not be too far in the future for us.

There were other exhibits as well, including how EDS provided ticketing and the web site for France 99, information on their activities in outsourcing IT with various companies and Governments such as ours.

The tour was wrapped up with a video on the future, how problems might be resolved around the globe, only to find out that EDS were already providing the solutions.

Viewing EDS, as purely an outsourcing company was completely incorrect as evidenced by our tour, with the range of solutions being provided by EDS being quite diverse.

Breast Endocrine Clinical Management Meetings



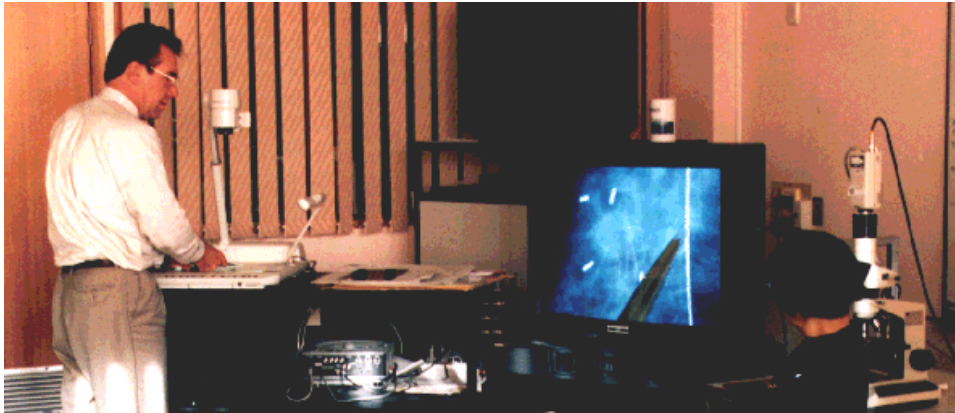
The *innovative* adoption of telehealth technology by the Breast Endocrine Unit of the Department of Surgery has enabled regular real time interaction of the multi-disciplinary team of specialists to occur simultaneously, rather than prolonged recurrent reviews over a period of time. Previously, cases were brought to a central management panel for

discussion and recommendation. The program which commenced in November 1997, has become integral with the clinical management of the Breast Endocrine Unit.

The sessions, chaired by Mr. Vlad Humeniuk and Mr. Rob Parkyn, provides a breast endocrine consultative service to regional South Australia with links into other areas of Australia. The sessions bring together specialists involved in the provision of the breast endocrine service and include Surgeons, Radiologists, Radiotherapist, Oncologist and a Pathologist. The regular telelinks have been established from The Queen Elizabeth Hospital (TQEH) campus of North Western Adelaide Health Service (NWAHS) to the Lyell McEwin Health Service campus of the NWAHS, South Australia (S.A.), Port Lincoln Hospital (S.A.), Port Augusta Hospital (S.A) and St. John of God Hospital, Bunbury in Western Australia (W.A.).

Best Practice of the Breast Endocrine services is enhanced by the use of telehealth technology in our organisation and is ensured by a continuous process of evaluation and modification of the service as required. Since the adoption of this technology the real time decision making has ensured early appropriate intervention for patient management. During these sessions the specialists discuss individual patient management and treatment together with providing opinions

and advice for Breast Malignancy, Benign Breast Disorders, Surgical Endocrinology (Thyroid, Parathyroid and Adrenal), Salivary Gland (Parotid, Sub-mandibular) and Surgical Oncology.



Telehealth technology is used at TQEH to connect with similar units in the other hospitals. Images of X-rays (mammograms, CT scans, isotope scans, MRI scans), clinical

photographs, clinical specimens, study reports, and case presentations are easily transmitted and received. A document camera is used to project these images, pathology sections (breast biopsies and other tissue) are displayed from a microscope viewed via a video camera mounted on the microscope. We found that it is essential to send snapshots of the image for the receiver to obtain a clear image while transmitting at 128Kb/sec. The quality of the images sent have been found to be of a diagnostic standard where the image magnification has been increased in the area of concern. The use of a back lit document camera is simple but extremely effective. In particular, the zoom and contrast control facilities allow better visualisation of fine detail on x-rays, an example is calcifications on mammography shown better than on the original. The high quality Histo Pathology images projected through the microscope allow transmission of fine points of discriminatory diagnosis to all involved in the case management sessions.

Our service has been able to meet the requirement for a Breast Endocrine service to regional, remote and rural South Australia. The use of this technology has reduced the costly practice of regular visits by specialists being required to travel to rural centres, or the need for patients and their X-rays, pathology slides, reports etc to the city. The use of this technology that enables real time interaction has been beneficial in maximising the use of scarce medical specialists by providing improved quality of service particularly for regional centres. Another advantages of the use of this telehealth technology to patients, their families and regional centres is the reduced need for transport of patients to a major referral hospital.

Although there are few multi disciplinary management teams within the field of Breast Endocrine from relatively few centres in Australia, our service is the only one using Telehealth technology. The success of our sessions has been demonstrated by the clinical interest generated from both within South Australia, nationally and internationally.

John Kirby

Multi Media Officer.

North Western Adelaide Health Service

From overseas

Many of you will remember John Hughes, keynote speaker at the BME conference in Hobart last year and also a guest of SMBE post conference. John has recently been awarded the Becton Dickinson Career Achievement Award

by The AAMI Foundation Awards Committee. The award was presented at their June Annual Meeting.

Details of the award are given below.

AAMI Becton Dickinson Career Achievement Award - identifies and encourages outstanding achievement(s) by a promising health care professional in the development or improvement of medical devices, instruments, or systems that will help all people live healthy lives.

Eligible candidates, therefore, are currently and directly involved with the use of technology in the delivery of health care such as a physician, nurse, administrator, engineer, or technician, individuals who are innovative, creative and committed to fundamentally improving the health and well being of the world's population. Candidates must have demonstrated intent to continue their career in the health care field.

Thanks to the generous support of Becton Dickinson Co., the award consists of \$1,000 and an engraved plaque.

CONFERENCE CALENDAR

October 24-28 EPSM "The Next Generation" Gold Coast QLD

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"47th annual meeting of the cardiac society of Australia and New Zealand" August 8-11
Wellington NZ

**"24th World Congress of the International Society of Cardiovascular Surgery" Sept 12-17
Melbourne**

"21st Annual International Conference of the IEEE Engineering in Medicine and Biology Society"
Oct 13-16 Atlanta Georgia USA

**"Medax-12th International Exhibition on Hospital Supplies and Medical Technology" Oct
18-21 Tel Aviv Israel**

"50th Annual Meeting of Royal Australasian College of Radiologists" Oct 21 26 sydney

Information on the above is available from the editor or president

E. & O.E.

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Nomination for Council position 1999/2001

Inominate for the position of Vice-

president/Treasurer/Councillor for the term 1999/2001.

Signednominee / /

Signedproposer / /

Signedseconded / /