

The Society for Medical &  
Biological Engineering S.A.  
Incorporated



PO Box 19, Woodville, SA 5011  
<http://www.smbe.asn.au>

# NEWSLETTER

## JANUARY 2001

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### Affiliations

*Australian Federation for Medical and Biological Engineering  
International Federation for Medical and Biological  
Engineering*

# SCIENTIFIC MEETING

Tuesday 6 February 2001

11 Bagot Street, North Adelaide

5-30pm Refreshments

6-00pm Presentation

**Bob McCullough**  
Technical Services Manager  
ABC

### What will Digital TV offer South Australians?

Digital transmission of television has been occurring since January 1 2001. Bob McCullough is coming to give us an overview of this interesting and historic change in Australian television.

His talk will include topics such as:

- *Why go to digital TV transmission (wide screen, surround sound and more.)*
- *The home TV receiver, and how it will change.*
- *Electronic program guides for digital.*
- *What is new at the studio and transmitter sites?*
- *The future of TV (from here).*

Bob is currently the ABC's Technical Services Manager with responsibility for planning, installation and maintenance of all ABC technical plant (Radio, TV and IT) in SA. One of his present major projects is to rebuild the SA TV technical plant using digital equipment. I'm sure his talk will be both interesting and informative, not to be missed.

This is a joint meeting with IEAUST and ACPSEM.

Tony Carlisle November 2000

### **PART 1**

One of the many BME facilities John Robson visited while in the United States a couple of months ago was the Clinical Engineering Department at Johns Hopkins Hospital, Baltimore, Maryland. Bob Stiefel, Director of the Clinical Engineering Department told John that he and other hospitals in the area were finding it difficult to recruit experienced biomed technicians. Hence an opportunity was spawned for me to head over there for 3 months and work in their department.

I received a warm welcome on my first day at work. There are about 20 BME technicians and 3 Engineers in the department at the moment, with ongoing vacancies for further 3 more technicians. The BME technician training college is down to only a few students at this time as there is little incentive over here for student BME technicians to enrol. Most of the potential students are looking primarily at what the typical salaries are followed by what career progress can be made in BME compared to other high tech careers. They are choosing to get into IT and related areas as the pay is around 150% to 200% that of a BME technician with greater career prospects.

I was put to good use straight away as my first day of work was also their first day of finishing daylight saving. So I went up to the Operating Theatre Suites with one of the guys to reset the clocks in a range of equipment types. There are more than 40 operating rooms and there is equipment stacked on trolleys hiding in all sorts of recesses. This took some time and when we finally finished I was lost. My internal compass was spinning. I had no idea how to exit the way I came in. We then checked the Recovery rooms followed by the ICU's. First was the Neuro ICU. Then the Surgical ICU, Cardiac ICU, Medical ICU, Paed ICU, Neonatal ICU. Each of these ICU's had approx 18 beds arranged in two rows of single rooms. Then came the step-down wards for each of the ICU's. I had to trust the guy I was with as he could have led me

anywhere. My legs were fairly tired at the end of this first day.

The workbenches are not big and everyone shares a phone and desktop computer. Part of everyone's tool kit includes a small trolley, toolbox, multiparameter simulator, a few specific simulators, calibrators, odds and sods, as well as an electrical safety checker. Most of the guys prefer to place their tools, simulators and spares on a trolley because when they go off to work in an area, they are often gone for a while for two main reasons. Firstly, they are likely to come across a lot of equipment and secondly, the lifts take ages before they arrive at your location. There are people walking around in all directions and there are 15 floors to contend with. Hence the formula for long waits in lift lobbies. So you might as well check on a few other pieces of equipment in your designated area. The department is split into teams and each team will look after everything in their area. This means having multiples of similar testing devices. Although there is a high cost to buy all this test equipment, at least there should be lots of backup test devices should one fail or be sent out for calibration.

The design of the Hospital is such that patients have a range of lifts to choose from and staff have another range to choose from. The staff lifts can only be accessed by swiping your Photo ID near the closed doorway in front of the staff lift areas. Also, your staff Photo ID needs to be prominently displayed at all times. If you forget to bring it, you need to get a one-day temporary staff sticker and stick it on your shirt. Every patient and every visitor must also log in and display their adhesive short-term sticker. The hospital security staff will not let you loiter inside the hospital. Just diverting a bit here, there is an armed policeman sitting in a little police box on every street corner in the immediate neighbourhood. The neighbourhood has a long reputation, and this is what the Baltimore Police Department has come up with to confront the problem head on. This has not been running for very long but I certainly feel very safe going for a walk at lunchtime to a nearby food mall.

The BME heirarchy (in ascending order) for this department starts with the BME Technical Associate. This is for people who are studying

for a formal qualification in BME technology, i.e., an Associates Degree in BME. This is a two-year full time course and is usually done at a technical college. A similar type of qualification back in Oz would be an Associate Diploma in BME. There is an automatic promotion to BME Technician I, once you gain the BME Associates Degree. After a couple of years of experience, you can sit for the AAMI BMET Exam for BMET certification. If you score at least 65% to 70% in all sections it is considered a pass. It costs a bit over USD\$200 to sit the exam but a financial incentive exists here. If you pass the exam you can expect between 5% to 7% pa increase in your salary because you are now a BME Tech grade II. The salary ranges for a BMET I and a BMET II overlap as this allows years of experience to count for something. Here at Johns Hopkins, the only way to get higher than BMET I is to get AAMI accreditation.

The BMET III's here are all team leaders. Each team on average consists of 3 technicians and one team leader. The department director strongly supports the AAMI accreditation and is in a position to run the department how he sees fit. Some of the other hospitals in the area do and some don't have financial incentives for accredited BME staff. It is entirely voluntary.

The hospital has just been delivered with over 400 new bedside monitors along with enough central stations to suit. They are stacked in a holding area (the former workshop in the basement) awaiting BME acceptance testing, inventory labeling and installation. This begins next Monday morning starting at 6am sharp (Several of the guys at work start at 6:30am to avoid the traffic congestion coming into the city and to get a car park in one of the expensive hospital car parks.) This monitor replacement program is largely funded from private sources. The hospital had a fundraiser project over the past 4 years and managed to raise one billion dollars.

I expect we are all going to be extremely busy for a while.



Baltimore City centre not far from my accommodation.

### **Summary of visit by Dr Joe Dyro**

Dr Joe Dyro of New York was the 2000 IEAust funded eminent speaker at the EPSM 2000 conference held in Newcastle. Along with his many presentations at that event we were also fortunate to have him tour the country to share his knowledge. This tour included Adelaide where he addressed us at a technical meeting.

Dr Dyro has many credits to his name. His initial experience was in hospital based Clinical Engineering program but has also spent time as a senior ECRI staff members and holds a number of academic appointments in Biomedical Engineering and Anaesthesia. He is editor of the prestigious Journal of Clinical Engineering and is very active within professional Clinical Engineering circles within the US and internationally. He is currently a consultant and frequent expert witness.

One topic that Dr Dyro raised during his visit was that of patient safety. Many of us will immediately think, on the mention of this topic, of electrical safety and the whole issue that really gave rise to the Clinical Engineering discipline in the 60's. However there is a totally new spin to the topic emerging that is being witnessed internationally. Data is starting to emerge that is quantifying the numbers of patients that suffer adverse effects of a visit to hospital, these effects being one or more of a multitude of possibilities. They include drug reactions or incorrect administration, falls, self inflicted injuries, surgical complications, poor

human interface design, electrical or other interference, infections, incorrect or lost lab or imaging studies and so the list goes on. There is a strong patient safety movement emerging within the US that is starting to keenly pursue the reasons for these problems and lobby for legislation or some other means of minimising them. That country's Institute of Medicine within the National Academy of Science recently released an extensive report on hospital incidents with claims that between 44,000 and 98,000 people die in US hospitals for these reasons. I recall that this is of the order of 2% of admissions. This could be dismissed as alarmist if it weren't for the credentials of the reporting body and the fact that there is data here within (and other countries) that supports these claims. In fact recently or own health here in SA flagged the fact that legislation is imminent to address the problem.

The point that Dr Dyro made very clearly is that mechanisms need to be put in to place to look at the reasons behind even the most outwardly innocuous incidents. Root cause analysis is an ideal mechanism to achieve this and biomedical engineering personnel are ideally placed to play a key role in getting it happening. This goes above and beyond, but complementary to, systems already in place such as the AIMS or TGA incident reporting and analysis mechanisms. The other key aspect of any such move is to get away from an environment that immediately attempts to apportion blame to an individual for an adverse incident. This culture inherently discourages the reporting of anything out of the ordinary.

A classic example given was the case of drug over or under infusion by way of an infusion pump. This is not an uncommon event with the immediate reaction typically being the arrangement of checking of pump calibration. More times than not this will be found to be correct and that is where the issue rests. The other factors that bear investigation in this scenario include possible incorrect selection of dose rates due to poor equipment design, user work/stress levels or environmental circumstances such as room lighting at the time. There may have been disturbances to the electrical supply, interference from mobile RF sources, problems with infusion sets,

interference/adjustment of dose rates by visitors or the patient themselves. The list is almost endless.

Whilst no one would anticipate having the resources or ability to investigate every seemingly minor incident to this extent, the take home message was clearly that we should be starting to think in this manner. This is the pathway towards better and more cost effective patient outcomes. The Biomedical Engineering discipline should wave the patient safety flag once again!

**Adrian Richards**

### **Christmas Dinner 2000**

Our annual Christmas Dinner at the Earl of Leicester was again well attended and very much enjoyed by all. The Earl again put on a good show with decorations, food and drinks being superb. There are several people who must be thanked for their effort in organising the night. Greg Smith and Kerry Nelson for organising the venue, food and beverages etc. Knut Gassmanis and Anu Wijesiriwardina for chasing up sponsorship, another very good response from the companies who support our industry. Peter Kelly, Managing Director Drager Medical, for donation of goods and for assisting with raffle draws. Anne Richards for organising the basket of goodies for the door prize.

A big thanks must be extended to the many companies who generously donated money and raffle prizes to ensure that we all enjoyed a festive occasion. They are listed below so please give them your support.

### **Farewell**

Our newest council member, Anu Wijesiriwardina has left us to take up a position with Medical Applications in Sydney. We wish her well in her new career.

### **Of interest**

The following teleconference may be of interest to those who have the facility. More information on this subject can be found at <http://www.fda.gov/cdrh/Useerror/Teleconference.html>

**Integrating Human Factors Engineering into Medical Device Design and Development** – a live satellite teleconference for medical device manufacturers. Wednesday, February 14, 2001, 1:00 - 3:00 p.m. EDT.

## Christmas Dinner sponsors

**DOMO TECHNICA**

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**SMITH & NEPHEW**

## HUMANS & MACHINES- MEDICAL TECHNOLOGY AT WORK.

The above course has been developed by the SMBE (NSW) in association with Healthquest International for the biomedical community.

“The course has been written for people who know that the only reason we need medical technology is to help humans. We would not need to measure, monitor or treat people if they were able to look after themselves. Similarly, we would not need medical technology if it did not help to diagnose or care for humans better, and for longer than other people without technical support.”

“This course has a strong clinical focus concentrating on the interface between humans and technology in real life.”

“This course has been specially designed to help solve common problems you may encounter in the clinical area. It adds to your expert knowledge of technology with some understanding of scenarios you will encounter and the diverse kinds of human needs that arise.”

The general objectives of the course are to:

- Gain fundamental knowledge of physiology and anatomy

- Develop an appropriately sensitive and caring response to the needs of the clients and their carers
- Recognise your role as a member of a healthcare team
- Problem solve in a range of care giving environments.

The modules introduced in this course include:

Thermoregulation, anaesthesia, cardiac pacing, mechanical ventilation, cardiac monitoring, blood gas monitoring, endoscopy, endoscopic surgery, microscopic surgery, in utero monitoring, renal dialysis and physiological therapeutic agents and devices.

The cost of the course is \$1100 for SMBE members, \$13 Wijesiriwardina 20 for non-members. The award is through Swinburne University of Technology, Melbourne.

More information can be obtained from Joanne Wilkinson, Manager HealthQuest International on ph: (03) 9496 3312 fax: (03) 9496 5325 or course coordinator Mara Manfrin on ph: (03)9496 3303 fax: (03) 9496 5325.

A copy of the registration of interest form can be obtained from the editor.

### **Advertising rates**

Full page ....\$100.00 ½ page ... ..\$50.00

¼ page ....\$25.00 Business card . \$25.00

A full or ½ page ad will now entitle the advertiser to a www link on the SMBE web site.

### **CONFERENCE CALENDAR**

“13<sup>th</sup> Triennial Cong Asia Pacific Orthopaedic Assoc”

April 1-6, Adelaide SA.

“Northern Territory Perioperative Nurses 4<sup>th</sup> Conference”

May 3 – 5 2001. Alice Springs

“EPSM 2001” Fremantle, WA. Sept 30-Oct 4

Information on the above is available from the editor or president

**E.& O.E.**

