

Report on the 2004 SMBE (NSW) Country Biomedical Engineering Conference

The 2004 SMBE (NSW) Country Biomedical Engineering conference was held in the picturesque town of Bateman's Bay, on the South Coast of NSW. Held over four days, from the 28th to the 31st of March, the theme of the conference was "Back to Basics", a return to the realm of the everyday biomedical technician.

The conference kicked off informally Sunday night, with a barbeque at the conference centre, the Bay Waters Inn.

A photo of
Bateman's Bay from
the conference
centre balcony.



The conference was very enjoyable, and a great opportunity to meet people from other hospitals and industry, as well as see the next generation of medical technology. There were many highlights from the conference.

Unfortunately, I cannot include them all, but I have included a selection of what I believe to be the most interesting topics.

Dr Colin Dunlop, a veterinarian, gave a very interesting presentation on the anaesthesia of birds. It gave an insight into the range of uses that standard medical equipment can be used for, and how they must adapt equipment and techniques to animals with significant physiological and behavioural differences to humans.

Monday afternoon was scheduled as a test equipment workshop, and attendees moved between the various display stalls examining the various test equipment available from companies such as Fluke Biomedical (formally Bio-Tek), Chivaune and Utech Medical. All three of these companies have a large range of test equipment, with a limited range on display, and they proceeded to demonstrate their devices.

One of the innovative test products on display (below) was the SimCube. A portable NIBP simulator, the SimCube's dimensions are approximately 8cm x 8cm x 9cm, making it easy to carry around. It's functions are limited in comparison to the larger NIBP test units, and it cannot perform tests such as overpressure.

But, while it also requires a separate power supply, it can easily be carried around in the field to perform spot checks, and can also include ECG simulation as an optional extra.



A minor distraction to the afternoon's activities was the booth (which shall remain nameless) that brought along some added entertainment in the form of the Daytona 500 arcade game. A small competition was started up to see who could obtain the best score, unfortunately, no prizes were on offer for this one!

Tuesday was the busiest day of the conference, with a large number of sessions scheduled, including presentations on impedance cardiography, a new TAFE

BME course and new technologies in defibrillation.

Impedance Cardiography (ICG) is a non-invasive test, using electrical conductivity, to determine a number of cardiac parameters, such as stroke volume, cardiac output, pre-ejection period etc. Using four pairs of electrodes, it measures impedance changes in conjunction with ECG measurements. It's uses include cardiac diagnosis/screening, pacemaker adjustments, long term ICU monitoring, monitoring during surgical procedures and stress testing. The major advantage of ICG, in comparison to other testing methods is that it is non-invasive and simple to use.

Mark Gilbert (mark.gilbert@tafensw.edu.au) from TAFE NSW talked about the new TAFE course in Medical Equipment Servicing & Technical Support. The course is to be at Certificate IV level and is designed to teach knowledge such as:

- OH & S requirements
- anatomy and function of the human body system
- the electrical characteristics of the human body and how & why this is used in clinical diagnosis/treatment
- electrical safety standards
- infection control principles
- use of appropriate resources in the installation, maintenance and repair of electronic medical equipment

The presentation on defibrillators was given by Steve Cox of Medtronics, and turned out to be one of the more controversial topics of the conference. The presentation compared a number of current biphasic defibrillators from different manufacturers, as well as comparing the newer biphasic technology with the monophasic defibrillators of the past. Mr Cox compared the waveforms of the various defibrillators at various energy levels, and came to the conclusion that "when it counts" (ie. In emergency situations), the statistics showed that there was very little difference in the effectiveness of the different defibrillators.

It was argued that many of the studies of biphasic defibrillators are flawed, because they often involve doctors employed by manufacturers, there are various definitions of a successful outcome when defibrillating a patient, and they often are not comparing apples with apples.

Monophasic defibrillators were then compared to biphasic and Mr. Cox indicated that while most people believe biphasic defibrillators are much more effective, there is still not enough statistical evidence to prove that one is better than the other. He also argued that the decision by the Australian Resuscitation Council to recommend a series of 150J shocks (150J/150J/150J as opposed to the policy of 200J/200J/360J on monophasic defibs, when used on patients in ventricular fibrillation) was premature, as there is not enough statistical evidence available to say that a shock at 150J energy levels in a biphasic defibrillator is any better than a shock at 200 or 360J in a monophasic defibrillator.

Future technology in electrosurgery was the topic presented by Ryan Fernandez. Mr Fernandez discussed what we could expect to see in new ESU's over the next few years, including:

- Modularity: to allow for hardware upgrades, so that monopolar, bipolar or return plate "modules" can be added as necessary.
- Ability to upgrade software (feature improvements & bug fixes)
- Better ease of use
- Improved safety
- New standard of technology

This will allow manufacturers to sell ESU's that are specific to particular countries regulatory requirements, as well as specific to the needs of individual hospitals or surgeons. ESU's may also incorporate more informative LCD displays, which will be able to show more information, and be more user friendly than the current generation ESU's.

The conference was finished off with Frank Kwiatkowski, the president of the SMBE (NSW), giving a brief talk on the available biomedical e-mail lists available for techs to use. The BmEList is an Australian mailing list, and instructions for how to subscribe to this list are to be e-mailed out to conference attendees following the conference. Biomedtalk-L is a US based e-mail list, but with members from a number of countries, and has a large number of contributors with a wealth of knowledge about biomedical engineering. To subscribe to this list, all that is required is to send an e-mail to listserv@listserv.aol.com, with "SUBSCRIBE BIOMEDTALK-L <first name> <last name>" in the body of the message (and of course, substituting your real name as requested).

Overall, the conference was a very rewarding experience, and I feel privileged to have been sent over by the SMBE to enjoy it. Next years NSW Country SMBE conference will be held in Tweed Heads, NSW. Hope to see you there!

Rhys Winn