

## **EPSM Incorporating ABEC 2005 Report**

The Adelaide Town Hall was the venue for the 2005 annual EPSM incorporating ABEC from the 23rd-27<sup>th</sup> October 2005. It was a privilege to attend and participate in the events made possible by the SMBE conference committee. The physical science stream contemplated aspects concerning *Translational Research* and the engineering theme *Ageing – People, Practice and Technology* provided a current insight into the realm of adaptive technology. My experience as a BME Technician and currently studying the Biomedical Engineering Degree provided the basis for my interest in the engineering presentations.



The welcome reception offered a good opportunity to familiarise faces & facilities as well as preliminarily browse the trade displays. This experience was best utilised to help build contacts who acted as a source of information throughout the week. The displays offered a great opportunity to discover and to become familiar with the next generation of medical equipment design. The incentive of accumulating company promotional merchandise was a deceptive facade to acquire a closer look at the equipment and be introduced to the representatives. Equipment available for demonstration and explanation included;

- Test Equipment from Fluke Biomedical.
- Anaesthetic Machine from Dräger Medical Australia.
- Patient Monitoring from Philips Medical and GE Healthcare.
- Defibrillators from Zoll Medical Australia.
- Intra Aortic Balloon Pumps from Medtel Pty Ltd.
- Infusion Devices from Baxter Healthcare and Cardinal Health.

The conference opening by Dr David Filby for Health System Improvement & Reform followed an introduction and welcome by conference convenor Tim van Doorn. Dr David Filby expressed best regards to all attending and focused on trends in technology incorporating the importance of justifiably adapting new technology when developed. The government saw this process as an integral part of healthcare.

NovitaTech's Lloyd Walker introduced the English born Canadian Geoff Fernie to describe adaptive technology for the older population. Geoff presented three topics.

- Research into *preventing falls* provided inventions such as the Sole Sensor (shoe insert with ribbed edge to excite nerves), Sturdy Grip (positional floor to ceiling grab bar) and Life Rail (rail design system to hug for assistance when using stairs). Geoff reminded us that the average human lifespan is increasing due to other advances in technology. As a result, the emphasis on technology that will assist in the reduction of predominately hip injury due to falls is important. Hence grab rails on ATMs, raised toilet seats and the Access Bathtub (wider side to swivel into & out of bathtub) will reduce injury by increasing the safety of the aged person's local environment.
- *Preventing injury to care givers* follows greater workload and instances of worker injury due to patient weight increasing. Improvements have been made to equipment designed to move patients. The use of overhead lifts, patient transportation and better sling designs account for a large portion of Geoff's research. Forces exerted on the body of the caregiver when handling patients have also been studied to create greater awareness of areas requiring support.
- *Cognitive support* relies on computerized automated processes prompting the aged person with a disability to act or remember to perform a task. This research requires an understanding of the disability to adapt the correct technology. A video demonstration was shown of person with Alzheimer disease being prompted by a recorded voice message with the correct sequence for washing hands. Another example demonstrated a computer program using video cameras that could identify when a person has fallen. This artificial care was described as context aware/sensitive technology and will lighten the workload for caregivers.

Geoff latter described an innovative Canadian rehabilitation technology research & development program called i-DAPT (derived from the word adapt). Challenging environment situations including stairs, winter, roads at night and the home (independent living) will be simulated to help understand problems people face with disabilities. The i-DAPT concept is designed to be a world leading centre for product development & testing of assistive technology. Lloyd Walker also contributed a presentation describing the collaborative approach of developing an assistive technology hub in Australia.

Peer review was presented as a keynote address by Bill Gentles and Tony Eastly from Canada. They explained the review process, lessons learnt and the benefits of implementing a review of a hospitals BME department. It was concluded that peer review should be encouraged and at intervals no less then three years apart. Mike Denison from NCPE/Engineers Australia explained a Victorian peer review trial based on the Canadian model.

A dedicated anaesthesia workshop day was a great experience to understand fundamental methods of anaesthesia, monitoring and concerns for the BME Technician. The day incorporated an open panel discussion that was insightful to gauge the level of responsibility the Anaesthetist sought from the BME Technician. Professor Harry Owen explained who an Anaesthetist is and what they need to know about the patient. He also expressed interest for engineers to continually develop patient simulation for training purposes. Dr Edward Murphy delivered an interesting presentation on reasons & techniques for patient monitoring. Dr Andrew Hardy spoke about the realist versus reactive thought processes Anaesthetists use when making decisions about a patient's condition during uncertainty.

Current concerns with trolley mounted medical electrical systems and the security with networked computer based medical equipment were discussed. These new generation issues focus greatly on legality when taking on responsibility by intentionally or otherwise not following manufacturer's recommendations in light of TGA legislation. Warnings were given not to ignore these compatibility or security issues, instead assume responsibility at a system level. The best way to control this is through planning & cooperation with equipment suppliers during the procurement process prior to a system install.

A large amount of the final day was dedicated to equipment replacement and risk management discussions. An economist of the Australian National University Canberra, John Deeble explained the present inconsistent & mysterious adhoc influences that govern capital investment. He mentioned that capital investment has been falling with relation to increasing population & hospital admissions. Bill Gentles contributed by describing the Canadian health model. It was interesting to learn about their non-profit, comprehensive and universal public hospital admission criteria. Risk management discussions focused on what should be taken into account when considering the lifetime of medical electrical equipment. Derivations and explanations of equipment risk score algorithms were proposed followed by an open forum to discuss different perceptions and ideas.

Other interesting presentations related to the physical science stream included the risk analysis of incorporating windows in a linear accelerator location of the St Vincents Hospital Sydney. The research team involved in this project worked tirelessly to measure and offer adequate levels of shielding. Paul Keall through teleconference from America described 4D CT imaging incorporating respiratory gating where dose is delivered during specific stages of respiratory to negate image distortion generated by patient breathing.

With the exception of my study commitments hindering attendance to some presentations and time to thoroughly look at posters, I have benefited as a technician & student by attending the conference. Next years EPSM incorporating ABEC will be held in the inviting Queensland township of Noosa from 17-21<sup>st</sup> September 2006 incorporating the theme *Maximising Benefit, Minimising Risk*. I thank Dräger & SMBE for sponsoring my attendance to the EPSM incorporating ABEC 2005 conference. The Encouragement Award gives valuable support & recognition to persons continually developing in the Biomedical Engineering discipline.

Lachlan Eberhard  
Dräger / SMBE Encouragement Award 2004