

Intensive Care and Hyperbaric Medicine



*Dr Deirdre Murphy and
Dr Andrew Hilton with ICU's new
echocardiographic platform.*

The Intensive Care Unit (ICU) at The Alfred remains one of the largest ICUs in Australia, with 35 beds in the complex and another 6 beds in ward 2C. This allows for the treatment of more than 1,700 patients annually, with major specialties including trauma, major burns, heart/lung transplantation, bone marrow transplantation, artificial hearts, extracorporeal membrane oxygenation, neurosurgery and infectious diseases.

The department has a well-developed clinical research program with major research themes including trauma (particularly severe traumatic brain injury), resuscitation fluids, septic shock, mechanical ventilation for acute lung injury, nutrition, extracorporeal support and cardiothoracic surgery.

Emphasis is placed on performing investigator-driven projects, the majority of which are multicentre collaborations with the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG), the National Trauma Research Institute, and several research groups in Canada. However, participation in industry-sponsored trials also occurs. Associate Professor Jamie Cooper (who holds an NHMRC Practitioner Fellowship), Dr Andrew Davies, Dr Vincent Pelligrino, Dr Bob Salamonsen and Associate Professor Carlos Scheinkestel are the predominant investigators. Most other full-time intensivists participate in research, eagerly supported by the entire ICU nursing group and allied health staff.

Research is funded from successful competitive grants (NHMRC, Victorian Trauma Foundation and Australian and New Zealand Intensive Care Foundation), with some funding from industry-sponsored projects. Such funding has supported our outstanding and enthusiastic ICU research team, which in 2004 included Lynne Murray, Shirley Vallance, Catherine Harry, Lisa Higgins, Katherine Moulden, Cindy Weatherburn, Siouxzy Morrison and Denise Durling.

Two randomised controlled trials of resuscitation fluids led by Alfred ICU investigators were published in major medical journals in 2004. A successful study of the use of hypertonic saline in the pre-hospital treatment of patients with hypotension and severe traumatic brain injury, led by Jamie Cooper, was published in *JAMA*. Another study comparing albumin and saline in the resuscitation of patients in the ICU (the SAFE study) was published in the *New England Journal of Medicine*. Jamie Cooper and Andrew Davies were heavily involved in the design and performance of the SAFE study, which recruited 6,997 patients, making it the largest study ever done with ICU patients.

Among many others, several major grants awarded in 2004 are worthy of note. The RENAL study with which Carlos Scheinkestel has had major involvement and which will investigate the 'dose' of renal replacement therapy in critically ill patients with acute renal failure, received over \$1.8 million from the NHMRC, and will commence in 2005.

The DECRA study, led by Jamie Cooper and Professor Jeffrey Rosenfeld, testing early decompressive craniectomy in severe traumatic brain injury, was awarded nearly \$500,000 by the NHMRC. This multicentre study is already under way in Australia and New Zealand and is presently in the process of expansion into Canada and Asia.

A multicentre study comparing the delivery of enteral nutrition into the jejunum with the stomach, led by Andrew Davies and endorsed by the ANZICS CTG, was awarded over \$150,000 by the Australian and New Zealand Intensive Care Foundation, and will commence in 2005.

ICU nurse and research coordinator Cindy Weatherburn received a \$15,000 project grant to perform a study of the BIS (bispectral index) monitor in ICU patients. With her colleagues, she was able to complete patient enrolment by the end of 2004.

Bob Salamonsen

Dr Bob Salamonsen has had a significant influence on the development of cardiac surgery in Australia by being instrumental in establishing the Australasian Board of Cardiovascular Perfusion, introducing the safe inhalational use of nitric oxide in pulmonary hypertension and hypoxia, participating in the Australian Round Table Initiative in cardiac surgery to develop a protocol for accelerated ICU recovery after cardiac surgery and developing extra-corporeal membrane oxygenation as an advanced ICU procedure for respiratory / circulatory support.

He also developed the cardiothoracic component of the ANZICS national database and is currently the ANZICS representative to the Therapeutic Goods Administration in Canberra. Bob is currently involved in the significant development and improvement of artificial heart technology in Australia and the use of the thromboelastogram for bedside monitoring of coagulation status in the ICU, particularly in relation to cardiac surgical postoperative care. His leadership and achievements in the field have resulted in him being awarded a well-earned clinical associate professorship.



Cindy Weatherburn

Cindy Weatherburn is a critical care nurse, currently working as a research coordinator and clinical nurse specialist within the ICU. Cindy obtained her Bachelor of Nursing in 1996 and has had extensive experience in critical care nursing in Australia and overseas. She has developed a keen interest in the sedation of ICU patients, which provided a research focus for her Master of Nursing Degree, completed in 2004 through the University of New England (NSW).

Cindy actively supports the development of a clinical nurse research model in which best practice is established by those who deliver patient care. She is currently leading a research project investigating the impact of bispectral index sedation monitoring on sedation administration in mechanically ventilated patients.



Bob Salamonsen has been closely involved with ongoing research studies involving the VentrAssist device (a ventricular assistance device for heart failure) and has received specific funding from Ventracor to assist him and his cardiothoracic surgery colleagues in understanding the performance characteristics and anticoagulation requirements of the device.

Current Projects

- DECRA: a randomised controlled trial of early decompressive craniectomy in traumatic brain injury
- VASST: randomised controlled trial of vasopressin versus noradrenaline in septic shock
- LOVS: a study of a lung open ventilation strategy in acute lung injury
- VALID: a study of surfactant in patients with acute lung injury
- DORI-10: a study comparing doripenem and imipenem in patients with ventilator-associated pneumonia
- CAPTIVATE: a phase 3, multicentre, study of Tifacogin (recombinant tissue factor pathway inhibitor) in severe community-acquired pneumonia
- The effects of low dose aminophylline on renal function in critically ill patients
- The effects of PEEP and recruitment manoeuvres in ALI
- Manual hyperinflation in patients on mechanical ventilation
- Invasive neuromonitoring in patients with traumatic brain injury
- Better outcome prediction in patients with traumatic brain injury
- A randomised controlled multicentre study comparing jejunal and gastric delivery of nutrition in ICU patients
- The impact of bispectral index monitoring on sedation administration in mechanically ventilated patients
- Evaluating the effect of pre-dilution on filter clotting time in the setting of acute renal failure
- Rapid sequence intubation in head injured patients
- Treatment of cardiac arrest with hypothermia
- CPR studies in swine
- Thromboelastogram in patients with VentrAssist VAD

Publications

Journal articles

Cooper DJ, Myles PS, McDermott FT, Murray LJ, Laidlaw J, Cooper G, Tremayne AB, Bernard SS, Ponsford J; HTS Study Investigators. Prehospital hypertonic saline resuscitation of patients with hypotension and severe traumatic brain injury: a randomised controlled trial. *JAMA* 2004;291(11):1350-7.

Davies AR, Bellomo R. Establishment of enteral nutrition: prokinetic agents and small bowel feeding tubes. *Curr Opin Crit Care* 2004;10(2):156-61.

Finfer S, Bellomo R, Boyce N, French J, Myburgh J, Norton R; SAFE Study Investigators. A comparison of albumin and saline for fluid resuscitation in the intensive care unit. *N Engl J Med* 2004;350(22):2247-56.

Finfer S, Bellomo R, Lipman J, French C, Dobb G, Myburgh J; ANZICS Clinical Trials Group. Adult-population incidence

of severe sepsis in Australian and New Zealand intensive care units. *Intensive Care Med* 2004;30(4):589-96.

Heng K, Bystrzycki A, Fitzgerald M, Gocentas R, Bernard S, Niggemeyer L, Cooper DJ, Kossmann T. Complications of intercostal catheter insertion using EMST techniques for chest trauma. *ANZ J Surg* 2004;74(6):420-3.

Kossmann T, Trease L, Freedman I, Malham G. Damage control surgery for spine trauma. *Injury* 2004 Jul;35(7):661-70.

MacLaren G, Anderson M. Bloodless intensive care: a case series and review of Jehovah's Witnesses in ICU. *Anaesth Intensive Care* 2004;32(6):798-803.

MacLaren G, Pellegrino V, Butt W, Prevolos A, Salamonsen R. Successful use of ECMO in adults with life-threatening infections. *Anaesth Intensive Care* 2004;32(5):707-10.

Millar IL. Should computed tomography of the chest be recommended in the medical certification of professional divers? *Br J Sports Med* 2004;38(1):2-3.

Scheinkestel CD, Jones K, Myles PS, Cooper DJ, Millar IL, Tuxen DV. Where to now with carbon monoxide poisoning? *Emerg Med Australas* 2004;16(2):151-4.

Grants and Other Funding

Bernard S, Danne P, Cooper DJ, Smith, K. Rapid sequence intubation in head injured patients. NHMRC Project Grant. 2004-2006: \$305,375.

Bernard S, Patrick I, Cooper DJ, Kelly AM, Silvester W. Treatment of cardiac arrest with hypothermia. NHMRC Project Grant. 2003-2006: \$295,000.

Cooper DJ. NHMRC Practitioner Fellowship. 2002-2006: \$250,000.

Cooper DJ, Dobb G, Bannan P. Decompressive craniectomy in acute traumatic brain injury. WAIMR. 2004: \$35,000.

Cooper DJ, Myburgh J, Bellomo R, Finfer S, Norton R, Boyce N, ANZICS CTG. Effect of saline and albumin on outcome in patients with severe traumatic brain injury. Victorian Trauma Foundation Best Practice Grant. 2004-2005: \$104,365.

Cooper DJ, Pellegrino V. VASST: low-dose vasopressin in septic shock. Canada CIHR. 2004: \$36,000.

Davies A, Bellomo R, Cooper DJ, Doig G, Finfer S, Heyland D. Jejunal versus gastric nutrition in ICU. ANZICS Foundation Project Grant. 2004-2006: \$154,000.

Davies AR, Marshall K, Nyulasi I, Leong T. Developing and evaluating evidence based guidelines for nutritional support in the intensive care unit: a cluster randomised trial. ANZICS Foundation. 2004: \$6,000.

Doig GS, Finfer S, Simpson F, Dobb G, Mitchell I, Davies AR. Developing and evaluating evidence-based guidelines for nutritional support in the intensive care unit: a cluster randomised trial. ANZICS Foundation. 2002-2004: \$550,000.

Salamonsen RF, James N. CPR studies in swine. Ventracor Project Grant. 2004: \$40,000.

Salamonsen RF. Thromboelastogram in patients with VentrAssist VAD. Ventracor Project Grant. 2004: \$39,600.

Weatherburn C. Impact of BIS monitoring in intensive care patients. Australian College of Critical Care Nurses (ACCCN) Project Grant. 2004-2005: \$15,000.

Substantial commercial funding was also received by the department.