We acknowledge and thank the following sponsor:

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Thank you to the following exhibitors:
The Conference Logo, “The Spark of Life”, symbolises the vital essence of energy which keeps the human heart beating and the drive to breathe. It is the energy spark which is still present when the heart stops because of accident or illness; and which can be fanned to the flame or full life again, by timely cardiopulmonary resuscitation.

The conference logo was the concept of Professor John Pearn and was designed by John Pearn and Mr Paul Ramsden, Artist of Brisbane, as a voluntary service.
THE COUNCIL

The Australian Resuscitation Council is a national voluntary coordinating body which represents all major groups involved in the teaching and practice of resuscitation as follows:

- Advanced Paediatric Life Support (APLS) Australia
- Australasian College for Emergency Medicine
- Australian College of Critical Care Nurses Ltd (ACCCN)
- Australian College of Nursing
- Australian Defence Force
- Australian and New Zealand College of Anaesthetists
- Australian and New Zealand College of Paramedicine
- Australian New Zealand Intensive Care Society (ANZICS)
- Australian Red Cross
- Cardiac Society of Australia and New Zealand
- College of Emergency Nursing Australasia Ltd (CENA)
- Council of Ambulance Authorities
- National Heart Foundation of Australia
- Paramedics Australasia
- Perinatal Society of Australia & New Zealand
- Royal Australasian College of Surgeons
- Royal Australian College of General Practitioners
- Royal Life Saving Society - Australia
- St John Ambulance Australia
- Surf Life Saving Australia Limited
- State Branches of the Council

CONFERENCE COMMITTEE

Mrs Carol Carey (Conference Convenor)

ARC Executive Committee

- A/Professor Jason Acworth
- Dr Richard Aickin
- A/Professor Jason Bendall
- Dr Janet Bray
- Professor Julie Considine
- Professor Hugh Grantham
- Dr Natalie Hood
- Ms Tracy Kidd
- Dr Peter Leman
- Professor Helen Liley
- Professor Peter Morley (ARC National Chairman)
- Mr Kevin Nation
- Ms Margaret Nicholson
- Professor Michael Parr (ARC Deputy Chairman)
- Dr Dion Stub
- Dr Marta Thio
VENUE
The Twelfth Spark of Life International Conference is being held at the International Convention Centre Sydney on Darling Harbour.

REGISTRATION CENTRE
Registration opening times as follows:

- Thursday 9 May 2019 - Neonatal Satellite / First Aid Professional Development Update Meetings - 7.30am
- Thursday 9 May 2019 - Cocktail reception - 6-8pm
- Friday 10 May and Saturday 11 May 2019 – 7.00am – 5.30pm

NAME BADGES
Please wear your name badge at all times during your attendance at the Conference.

LUNCH, MORNING AND AFTERNOON TEA
Lunch, morning and afternoon tea will be available for all meetings.
- Thursday 9th May – Meal breaks will be served in the Foyer of Meeting Rooms C4.8 and C4.9 on Level 4.
- Friday 10th & Saturday 11th May – Meal breaks will be served in the Parkside Ballroom on Level 2.

WELCOMING COCKTAIL RECEPTION
The Welcoming Cocktail Reception for Conference delegates who have registered plus registered paying accompanying persons will be held on Thursday 9 May from 6 - 8pm in the Parkside Ballroom on Level 2.

CONFERENCE DINNER
The Conference Dinner will be held in the Magnifique Ballroom at Sofitel on Darling Harbour, 7.30pm for 8pm. Dress will be lounge suit. If you have registered and paid for the dinner there will be a ticket/s in your registration envelope.

TRADE EXHIBITION
The Trade Exhibition will be situated in the Parkside Ballroom on Level 2. The Trade Exhibition is an integral part of the Conference and all companies have made a significant contribution to the management of the meeting.

POSTER PRESENTATION
The poster presentations will be incorporated into the Trade Exhibition Area in the Parkside Ballroom on Level 2. Posters will be displayed throughout the conference.

SPEAKER PREP ROOM
A speaker prep room will be open during the scientific sessions; presenters are requested to preview their presentations prior to the commencement of the session in which they are participating.

MEETING ROOMS
Thursday 9 May 2019
- First Aid Professional Development Update Meeting Level 4 - Meeting Room C4.8
- Neonatal Satellite Meeting Level 4 - Meeting Room C4.9

Friday 10 May & Saturday 11 May 2019
- Trade Exhibition Area and meal breaks Level 2 - Parkside Ballroom

Friday 10 May 2019
- SOL Conference Plenary Sessions Level 3 - Cockle Bay Room

Free Paper Sessions 1400-1415
- Session 1 Level 3 - Meeting Room C3.3
- Session 2 Level 3 - Meeting Rooms C3.4&C3.5
- Session 3 Level 3 - Meeting Room C3.6

Saturday 11 May 2019
- SOL Conference Plenary Sessions Level 3 - Cockle Bay Room
INTERNATIONAL KEYNOTE SPEAKERS

Dr Andrew LOCKEY (UK)

Dr Andy Lockey has been a Consultant in Emergency Medicine at Calderdale & Huddersfield Foundation Trust in the UK since April 2002. In addition to this role, he is an Associate Dean for Health Education England (covering Yorkshire & the Humber). Andy has been actively involved with resuscitation training since 1993, when he became an ALS instructor. He was invited to be the first ‘Trainee Representative’ on the RC(UK) ALS Sub-Committee in 1999 and went on to chair that committee from 2004 to 2011. During this time, he oversaw the implementation and validation of the e-ALS course. He has been a Trustee of RC(UK) since 2011. Further afield, Andy has been an active member of the ILCOR EIT Taskforce since 2010 and is currently a Domain Lead as well. He has also been tasked to co-lead on the ILCOR World Restart a Heart initiative.

Professor Jerry NOLAN (UK)

Jerry Nolan is a consultant in anaesthesia and intensive care medicine at the Royal United Hospital, Bath, UK and Honorary Professor of Resuscitation Medicine at the University of Bristol, UK.

He trained at Bristol Medical School and undertook anaesthesia and critical care training in the UK in Plymouth, Bristol, Bath and Southampton, and at the Shock Trauma Center, Baltimore in the United States.

Jerry is Chairman of the European Resuscitation Council (ERC), Editor-in-Chief of the journal Resuscitation and Chairman of the UK National Cardiac Arrest Audit Steering Group. He was a previous Co-chairman of the International Liaison Committee on Resuscitation (ILCOR) and co-editor for the 2015 International Consensus on CPR Science with Treatment Recommendations.

Jerry’s research interests are in cardiopulmonary resuscitation, airway management, and post-cardiac arrest treatment.
Professor Susan NIERMEYER (USA)

Susie Niermeyer, MD, MPH is Professor of Pediatrics in the Section of Neonatology at the University of Colorado School of Medicine at the Anschutz Medical Center. She practices and teaches at Children's Hospital Colorado, University of Colorado Hospital, and community hospital nurseries in the Denver area. She also serves as faculty in epidemiology and the Center for Global Health at the Colorado School of Public Health.

Susie’s clinical and educational areas of emphasis include neonatal resuscitation, cardiopulmonary physiology in infancy, and global neonatal survival. She has served as co-chair of the American Academy of Pediatrics Neonatal Resuscitation Program Steering Committee and editor of the ILCOR (International Liaison Committee on Resuscitation) neonatal resuscitation guidelines in 2000.

She currently serves as editor-in-chief for Helping Babies Breathe, the AAP educational program for neonatal resuscitation in resource-limited settings, and continuity editor for the suite of Helping Babies Survive programs, including also Essential Care for Every Baby and Essential Care for Small Babies.

Susie’s research interests center on adaptation in the neonatal period, with a focus on cardiopulmonary adaptation and low birth weight at high altitude. Her high-altitude research has included study of infant oxygenation in Lhasa, Tibet, studies of infant birth weight and cardiopulmonary adaptation in La Paz, Bolivia, studies of pulmonary hypertension and cardiopathies in Peruvian children, and pulse oximetry screening for critical congenital heart disease at moderate to high altitude in Colorado.

Underlying her interest in neonatal resuscitation and high-altitude physiology is a strong commitment to the health of children around the world, especially those in isolated and resource-constrained regions. This is reflected in her continuing role with the American Academy of Pediatrics (AAP) in development and implementation of the Helping Babies Survive suite of educational materials, aimed at reducing the major causes of newborn deaths and improving global neonatal survival. She is also a Senior Medical Advisor for Newborn Health with the United States Agency for International Development and technical consultant to the World Health Organization for development of global programs in perinatal education.
Professor Colm O’DONNELL (Dublin)

Colm O’Donnell is a Consultant Neonatologist at the National Maternity Hospital; Professor at the UCD School of Medicine; and Director of Clinical Research at the National Children’s Research Centre, all in Dublin, Ireland. He worked in General Medicine and Paediatrics in Ireland before moving to Melbourne, Australia to pursue further training in Neonatology. He completed a Fellowship and was a Consultant Neonatologist at the Royal Women's Hospital and at NETS Victoria; and was awarded a PhD by the University of Melbourne for his research on resuscitation of newborns. Since returning to Ireland in 2006, he has combined clinical research with a busy clinical workload. He has led many randomised clinical trials of interventions in the delivery room and neonatal intensive care unit, including international multicentre trials and trials of investigational medicinal products. He has been a member of the Neonatal Task Force of ILCOR since 2006 and is a member of the Neonatal Review Group of the Cochrane Collaboration. He is the Chief Investigator of the POPART study, an international multicentre randomised controlled trial of prophylactic oropharyngeal surfactant at birth to prevent respiratory failure in premature babies. POPART is supported by PedCRIN, an initiative of the European Union's Horizon 2020 funding programme, and provides some respite from the demands of juvenile Camogie management and a burgeoning career in rock.
Dr Theresa Mariero OLASVEENGEN (Norway)

Dr Olasveengen is a senior researcher and anaesthesiologist at Oslo University Hospital with a broad interest in cardiac arrest research; from qualitative studies in emergency medical dispatch to clinical studies, randomized trials and basic animal research. Current research is concentrated on how to protect the brain in the immediate post-arrest phase. She is also chair of the International Liaison Committee On Resuscitation (ILCOR) Basic Life Support task force, and co-chair of the European Resuscitation Councils Basic Life Support Science and Education Committee, working to evaluate our current knowledge base in resuscitation science and translate this knowledge into guidelines and education.

Dr Federico SEMERARO (Italy)

Federico Semeraro, MD, FERC is a Consultant in Anaesthesia and Intensive Care Maggiore Hospital, Bologna, Italy. He is Past President of Italian Resuscitation Council and SEC BLS co-chair committee European Resuscitation Council. From 2014, He is Italian National Coordinator for EuReCa One-Two study and referent for Italian Cardiac Arrest Registry (RIAC).

He is also project coordinator of Relive Game (relivegame.org), a breathtaking picnic (https://goo.gl/6Bwu68) and Virtual Reality CPR project (https://goo.gl/xCeQTy). His true passion is connection between medicine, training and innovation technology applied to CPR training. He is affected by addiction for Star Trek and Star Wars. He is creator of #LLAP Live Long And Prosper campaign in 2018 (https://goo.gl/chp2Nq).
AUSTRALASIAN VISITOR

Dr Richard AICKIN (NZ)

Richard is Chairman of both the New Zealand Resuscitation Council (NZRC) and the Australian and New Zealand Committee on Resuscitation (ANZCOR) as well as Vice Chair of the ILCOR Paediatric task force. He is a Paediatric Emergency Physician at the Starship Hospital, Auckland, New Zealand.
# FIRST AID PROFESSIONAL DEVELOPMENT UPDATE MEETING

**THURSDAY 9 MAY 2019 - MEETING ROOM C4.8**

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<th>Time</th>
<th>Session</th>
<th>Speaker/Coordinator</th>
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<tr>
<td>09:00 - 09:30</td>
<td>WELCOME</td>
<td>Prof Hugh Grantham</td>
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<tr>
<td>09:30 – 10:00</td>
<td>Bleeding Tourniquets</td>
<td>Dr Finlay Macneil</td>
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<tr>
<td>09:30 – 10:00</td>
<td>Breathing</td>
<td>Ms Toni Dunbabin</td>
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<tr>
<td>10:00 – 10:30</td>
<td>Burns</td>
<td>Mr Alan Morrison</td>
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<td>10:30 – 11:00</td>
<td>Morning Tea</td>
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<tr>
<td>11:00 - 11:30</td>
<td>Spines</td>
<td>Prof Julie Considine / Dr Natalie Hood</td>
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<tr>
<td>11:30 – 12:00</td>
<td>Oxygen</td>
<td>Prof Peter Morley</td>
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<td>12:00 – 13:00</td>
<td>Lunch</td>
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<tr>
<td>13:00 – 13:30</td>
<td>Paediatrics</td>
<td>Dr Richard Aickin / AProf Jason Acworth</td>
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<tr>
<td>13:30 – 14:00</td>
<td>Anaphylaxis</td>
<td>Prof Jason Bendall</td>
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<td>14:00 – 14:30</td>
<td>The Agitated Patient</td>
<td>Mr Tom Clark</td>
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<td>14:30 – 15:00</td>
<td>Cultural Competency</td>
<td>Ms Suzie Avis</td>
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<td>15:00 – 15:30</td>
<td>Afternoon Tea Break</td>
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<tr>
<td>15:30 – 16:00</td>
<td>Future Teaching</td>
<td>Mr Mike Gale / AProf Jason Acworth</td>
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<tr>
<td>16:00 – 16:30</td>
<td>Future Technology</td>
<td>Mr Darryl Clare / Ms Tracy Kidd</td>
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<tr>
<td>16:30 – 16:45</td>
<td>Closing</td>
<td>Prof Hugh Grantham</td>
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</table>
Dr Richard AICKIN (NZ)

Richard is Chairman of both the New Zealand Resuscitation Council (NZRC) and the Australian and New Zealand Committee on Resuscitation (ANZCOR) as well as Vice Chair of the ILCOR Paediatric task force. He is a Paediatric Emergency Physician at the Starship Hospital, Auckland, New Zealand.

A/Professor Jason ACWORTH

Jason is the Director of Paediatric Emergency Medicine at the Queensland Children’s Hospital. Jason has a long-held passion for paediatric resuscitation and simulation education. His current research work is focussing on paediatric rapid response systems in Australia and New Zealand.

He is the current President of Advanced Paediatric Life Support Australia, is a paediatric representative on the Australian Resuscitation Council and is a member of the State Council of St John Ambulance Queensland. Jason has co-authored over 40 publications in peer reviewed journals. He was a part of the group that established the PREDICT (Paediatric Research in Emergency Departments International Collaborative) paediatric emergency research network, serving as its Chair in 2008-2009. He was also Chair of the international Paediatric Emergency Research Network (PERN) in 2010.

Ms Suzanne AVIS

Suzanne Avis is the Paramedicine Discipline Lead for the University of Tasmania and Deputy Chair of the NSW Branch of the Australian Resuscitation Council. Suzanne has experience in clinical guideline writing and evidence evaluation with ILCOR and the ARC. Suzie has broad experience teaching and training BLS, ALS and out of hospital care and is an ALS Course Director and Instructor.
A/Professor Jason BENDALL

A/Prof Jason Bendall is the Deputy Director of Training & Deputy Chair of the Medical Advisory Panel for St John Ambulance Australia. Jason is a Specialist in Anaesthesia and Prehospital & Retrieval Medicine at John Hunter Hospital Newcastle. Jason is the Convener of ANZCOR First Aid sub-committee and is a member of the ILCOR First Aid Task Force.

Mr Darryl CLARE

Darryl is a passionate educator that has been involved in clinical education for 25 years. He has a passion for education, research and implementing best practice in pre-hospital care. He is always looking for new and innovative ways to deliver education that makes it both engaging and dynamic, he has developed and delivered many successful education programs and has an interest in the use of technology in training. In 2008 Darryl was awarded the Medal of the Order of Australia OAM for his service to the Scout Association and St John Ambulance.

Mr Tom CLARK

Tom is the Senior Trainer in First Aid and Mental Health First Aid for the Australian Red Cross, responsible for all training and trainers in Victoria and Tasmania. He is also engaged in developing and reviewing national guidelines in first aid and mental health for the Australian Red Cross.

Tom is passionate about first aid and saving lives, spending many voluntary hours with St John Ambulance Victoria at public events and in training the volunteers in first aid. Tom is the Red Cross delegate on the Australian Resuscitation Council and the host for the meetings of the Victorian Branch of the Australian Resuscitation Council.
Ms Toni DUNBABIN

Toni is a Registered Nurse with over 30 years of Emergency & Intensive Care experience. Currently Toni divides her time between 2 half time positions in southern Tassie – as the Clinical Nurse Consultant for Deteriorating Patients & the Post Graduate Medical Council of Tasmania (PMCT) Clinical Educator.

When not apparently chasing down Code Blues, MET calls & facilitating clinical education in hospital, primary health & university settings, Toni is the Australian Resuscitation Council -Tas Branch Chair. Being involved in the production of the Shock Verdict Video was one of her most challenging & rewarding community initiatives.

Professor Julie CONSIDINE

Professor Julie Considine holds a joint appointment between Deakin University and Eastern Health, one of Victoria’s largest health services. Julie is a leader in emergency nursing research and education with a particular interest in evidence-informed emergency care. Julie has over 160 publications and has attracted over $5.2M in research and project funding. She is a founding fellow of the College of Emergency Nursing Australasia and fellow of the Australian College of Nursing. Julie is Deputy Editor of the Australasian Emergency Care, represents the College of Emergency Nursing Australasia on the Australian Resuscitation Council, and is a member of the International Liaison Committee of Resuscitation Basic Life Support TaskForce.

Mrs Tracy KIDD

Tracy Kidd is a registered nurse with a background in emergency and critical care nursing across metropolitan, regional and rural Victoria. She has completed a Masters in nursing science: clinical education and currently provides continuing nursing education with a clinical risk focus and Advanced Life Support education across the Loddon Mallee Region in Victoria. She has been the Australian College of Nursing representative on the Australian Resuscitation Council since 2013.
Mr Michael GALE

Mike is the National Course Coordinator for the Australian Resuscitation Council and an active Instructor and Director in all ARC Courses. He has been involved in ARC Courses since their commencement in 2005 and leads curriculum development on the ARC Provider and Instructor Courses. He has been involved in inter-professional education for over 25 years in resuscitation, basic life support, first aid, health professional acute and critical care. He continues to practice clinically as a Registered Nurse in an Angiography and Cardiac Intervention suite for an acute 24 hour emergency service at the Fiona Stanley Hospital in Western Australia.

Professor Hugh GRANTHAM

Professor Grantham has a long history of involvement with emergency medicine and resuscitation. Hugh has worked in general practice, ambulance services, disaster medicine and academia. Hugh has been on the national Australian Resuscitation Council for almost past 20 years and is currently Convenor of the BLS Sub-Committee. He is currently clinically active as a senior medical practitioner in Flinders Medical Centre emergency department, a senior medical practitioner with SA ambulance service and as an academic with strong interests in resuscitation. Hugh is passionate about resuscitation and resuscitation education and is a senior educator for the Australian Resuscitation Council advanced life-support courses.

Dr Natalie HOOD

Natalie is a paediatric emergency physician who has been the medical advisor to SLSA for fifteen years and their representative on the Australian Resuscitation Council. She is a member of the ILCOR First Aid Task Force. In the role as an evidence reviewer and question owner for a number of the first aid topics Natalie has been actively involved in the formulation of the ILCOR CoSTR first aid treatment recommendations. As an active, patrolling lifesaver, she can focus on applicability of these recommendations to the frontline aquatic environment.
Dr Finlay MACNEIL

Finlay is the only surgeon on ANZCOR. He is a conjoint Senior Lecturer in Surgery at Newcastle University. He served on the Board of Training for his specialty for the College of Surgeons and still assesses international graduates for Fellowship of the College. He was also the Chief Professional Officer of St John in Australia for 6 years and currently serves as a surgeon in 3HSB (Army). He has a vital interest in the control of bleeding.

Mr Alan MORRISON

Alan is an Intensive Care Paramedic, Director Education with NSW Ambulance and Chair of the NSW Branch of the Australian Resuscitation Council. He has been involved in out of hospital care education for over 20 years spanning first aid, paramedicine and Advanced Life Support. He lives in Sydney and enjoys spending time with family, weekends in the Blue Mountains and riding his motorbike.

Professor Peter MORLEY

Peter Morley is Chairman of the Australian Resuscitation Council and represents ANZICS on the ARC. Peter has been an Editorial Board member and Evidence Evaluation Expert for the ILCOR international consensus process for resuscitation science in 2005, 2010, and 2015. Peter now holds the position of ILCOR Treasurer.
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<th>Session</th>
<th>Chair</th>
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<td>09:00 - 09:10</td>
<td>Welcome</td>
<td>ARC Chairman Prof Peter Morley</td>
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<tr>
<td>09:10 - 09:40</td>
<td>What’s New in Neonatal Resuscitation</td>
<td>Chair – Prof Helen Liley</td>
<td>Prof Susan Niermeyer</td>
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<tr>
<td>09:10 - 09:40</td>
<td>What’s Hot (and What’s Not) in Newborn Resuscitation</td>
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<td>Prof Susan Niermeyer</td>
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<tr>
<td>09:40 – 10:10</td>
<td>What’s Hot (and What’s Not) in Newborn Resuscitation</td>
<td>Is timing everything?</td>
<td>Prof Colm O’Donnell</td>
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<td>10:10 – 10:40</td>
<td>Adrenaline – Is it about time?</td>
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<td>Prof Stuart Hooper</td>
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<td>10:40 – 11:00</td>
<td>Morning Tea</td>
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<td>11:00 - 11:30</td>
<td>Delayed Cord Clamping – Still Hot</td>
<td>Chair – Prof Colm O’Donnell</td>
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<tr>
<td>11:00 - 11:30</td>
<td>What’s the clinical evidence now?</td>
<td></td>
<td>Prof Susan Niermeyer</td>
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<td>11:30 – 12:00</td>
<td>How does it work - Transfusion, haemodynamics, stem cells or hands off?</td>
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<td>Prof Martin Kluckow</td>
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<tr>
<td>12:00 – 12:30</td>
<td>Feasibility of resuscitation before cord clamping?</td>
<td></td>
<td>Dr Lindsay Mildenhall</td>
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<tr>
<td>12:30 – 13:30</td>
<td>Lunch &amp; Poster Walk</td>
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<tr>
<td>13:30 – 13:45</td>
<td>Free Papers</td>
<td>Chair – Dr Marta Thio</td>
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<tr>
<td>13:30 – 13:45</td>
<td>Thermal Management During Neonatal Resuscitation</td>
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<td>Dr Mia McLanders</td>
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<td>13:45 – 14:00</td>
<td>Respiratory Monitors to Teach Newborn Facemask Ventilation: An RCT</td>
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<td>Dr Eoin O’Curraín</td>
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<tr>
<td>14:00 – 14:30</td>
<td>Oxygen and Ventilation in Neonatal Resuscitation</td>
<td>Newborn/infant resuscitation: known unknowns and unknown unknowns</td>
<td>Dr Mark Tracy</td>
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<tr>
<td>14:00 – 14:30</td>
<td>Newborn/infant resuscitation: known unknowns and unknown unknowns</td>
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<tr>
<td>14:30 – 15:00</td>
<td>Starting FiO2 – do we know what’s best?</td>
<td></td>
<td>Dr Jennifer Dawson</td>
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<tr>
<td>15:00 – 15:30</td>
<td>Targets, signals &amp; alarms, and the non-responding baby - Human factors</td>
<td></td>
<td>Prof Helen Liley</td>
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<tr>
<td>15:30 – 15:45</td>
<td>Stretch your legs</td>
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<tr>
<td>15:45 – 16:05</td>
<td>Equity in Resuscitation – Chair – Dr Lindsay Mildenhall</td>
<td>Role of retrieval services</td>
<td>Dr Kathryn Carmo &amp; Dr Marta Thio</td>
</tr>
<tr>
<td>16:05 – 16:25</td>
<td>Helping Babies Breathe – an update</td>
<td></td>
<td>Prof Susan Niermeyer</td>
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<tr>
<td>16:25 – 16:45</td>
<td>Keeping it simple</td>
<td></td>
<td>Prof Colm O’Donnell</td>
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<tr>
<td>16:45 – 17:00</td>
<td>Wrap up</td>
<td></td>
<td>Prof Helen Liley</td>
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Dr Jennifer Dawson

Dr Jennifer Dawson has been working with neonates and their families after completing the neonatal intensive care course at The Royal Canberra Hospital. She has worked in neonatal units in London and around Australia. She has held clinical nurse educator, clinical nurse consultant, and nurse unit manager roles. Her current role is nurse researcher and clinical trial coordinator for the PLUSS trial at the Royal Women’s Hospital, Melbourne.

Jennifer has published over 100 peer-reviewed papers with a focus on neonatal transition. She works with a team of researchers led by Professor Peter Davis at RWH whose goal is “to make the babies better”.

Dr Kathryn Carmo

Dr Kathryn Browning Carmo is the Deputy Director of NETS NSW and a Senior Staff Specialist Neonatologist in the Grace Centre for Newborn Intensive Care. She holds a PhD in Neonatal Retrieval medicine and is passionate about rural and regional babies having equity of access to the tertiary and quaternary paediatric system when they need it.
Professor Stuart HOOPER

Professor Stuart Hooper is an NHMRC Principal Research Fellow and Director of the Ritchie Centre at the Hudson Institute of Medical Research and Monash University. He is a foetal and neonatal physiologist whose research focuses on foetal and neonatal lung development and its transformation into a functional gas-exchange organ at birth. Stuart also leads a multi-disciplinary research team that has pioneered the use of phase-contrast X-ray imaging to image the entry of air into the lungs at birth.

Professor Martin KLUCKOW

Martin Kluckow is a Senior Staff Specialist in Neonatology at Royal North Shore Hospital in Sydney and a Professor of Neonatology at the University of Sydney, Australia. He also holds an honorary position at 2 other academic hospitals. With his Sydney based research group, he has led the development of neonatal haemodynamics and point of care ultrasound in the neonatal unit for the past 20 years, publishing over 100 peer reviewed articles. His research has centered around the physiology and transitional circulation of infants born prematurely, the time frame of changes and the relationship of these changes to complications of prematurity. He has particular interests in the patent ductus arteriosus, management of hypotension and pulmonary hypertension, umbilical cord clamping time and ultrasound training and accreditation.

- 100 Publications in peer reviewed journals, 35 in the past 5 years
- Lifetime citation index = 3680, h-Index = 32
- Regular manuscript reviewer for 10 international journals
- $6 Million of peer reviewed grants in past 5 years
- International Plenary speaker 5-6 times per year
Professor Helen LILEY
Prof Helen Liley is a neonatologist at Mater Mothers' Hospital in Brisbane. She is the Perinatal Society of Australia and NZ representative on the Australian Resuscitation Council and a member (since 2009) of the Neonatal Task Force of the International Liaison Committee on Resuscitation.

Dr Lindsay MILDENHALL
Lindsay Mildenhall is a Consultant Neonatologist at Counties Manukau District Health Board, Auckland NZ. He has research interests in neonatal echocardiography, resuscitation and deferred cord clamping. He was an ILCOR Neonatal worksheet author for the 2010 and 2015 reviews and remains a task force member for the current review. His focus has been evaluating the evidence surrounding chest compressions and adrenaline use during neonatal resuscitation. Lindsay has represented the NZ Paediatric Society on the NZ Resus Council since 1999 and is more recently a member of ANZCOR.

Dr Marta THIO
Dr Marta Thio is a Spanish-trained Neonatologist who has worked at the Women’s Hospital, Melbourne and PIPER-Neonatal retrieval since 2010. She has an interest in training, education and research related to Neonatal Resuscitation. She has been involved in Neonatal Resuscitation training since 2000, first in Spain (National Resuscitation Guidelines and Training Program developer, and currently scientific assessor) and since 2010 also in Victoria. She reviewed the neoResus website before it went live and she contributes to its updates and delivery of the training program. She joined the ILCOR committee in 2015.
Dr Mark TRACY

Mark Tracy leads a research group focused on resuscitation and ventilation of newborns and infants at the Westmead NICU & The Department of Paediatrics and Child Health, NSW.
ABSTRACTS
NEONATAL SATELLITE MEETING
TITLE: WHAT'S HOT (AND WHAT'S NOT) IN NEWBORN RESUSCITATION

AUTHOR: Prof Susan Niermeyer

The International Liaison Committee on Resuscitation (ILCOR) has shifted from cycles of evidence evaluation and guideline publication every 5 years to a process of continuous evidence evaluation and guideline updates highlighting the most controversial, rapidly changing, and fundamental interventions. The Neonatal ILCOR group recently completed an evidence update on initial oxygen concentrations for positive-pressure ventilation in term and preterm infants, affirming the initiation of PPV with 21% oxygen in term infants and specifically recommending against initial use of 100% oxygen. For preterm infants < 35 weeks, low oxygen concentration (21-30%) is suggested. This update further emphasizes the importance of having blended oxygen available at all deliveries. Evidence evaluation is currently in progress comparing standard surfactant administration with endotracheal intubation followed by ventilation and less-invasive or minimally invasive surfactant administration (LISA or MIST) alternatives such as intubation with a catheter or endotracheal tube followed by prompt extubation, administration via supraglottic airway or intrapharyngeal tube, and nebulization with CPAP or NIPPV.

Controversy following the change in approach to resuscitation of depressed infants with meconium-stained amniotic fluid has spurred follow-up comparison of expectant management of the non-vigorous infant to initial laryngoscopy with or without suctioning. Finally, the neonatal group together with an ILCOR Knowledge Synthesis Unit (KSU) is undertaking a network meta-analysis of the burgeoning number of trials of exploring various approaches to umbilical cord management. Network analysis will permit multiple comparisons between not only immediate and delayed clamping, but also between variations with respiratory support before delayed clamping and between delayed clamping and umbilical cord milking.

TITLE: IS TIMING IS EVERYTHING?

AUTHOR: Prof Colm O'Donnell

DEPARTMENT/ORGANISATION: National Maternity Hospital; University College Dublin; National Children's Research Centre, Dublin, Ireland

Since Apgar first assigned a score to newborns at one minute of life, we've been preoccupied with the clock. When umbilical cords were clamped immediately, guidelines recommended that babies were assessed, warmed and given mask ventilation within a minute. Those who didn’t respond to mask ventilation were to receive chest compressions and be intubated within 90 seconds, and intubation was supposed to be successful within 20 seconds. Today, the umbilical cord is more likely to be clamped a minute or more after birth, and it’s unclear how this affects timing of assessment and intervention.

A baby’s heart rate is the most important indicator of their condition, need for and response to resuscitation in the delivery room. ECG has been reported to give a heart rate value more quickly than pulse oximetry. It comes at a cost; is it worth it?

When most preterm infants were intubated and ventilated treated for respiratory distress syndrome (RDS), studies showed that giving surfactant earlier in the course was beneficial, and many infants were intubated for prophylactic endotracheal surfactant. However, intubation is difficult and has adverse effects on babies. Today, the majority of preterm infants are initially treated with continuous positive airway pressure (CPAP). Unfortunately, half of them are ultimately intubated for surfactant. We suspect that babies could benefit from surfactant without the risks associated with intubation are studying whether prophylactic oropharyngeal surfactant will reduce respiratory failure in preterm infants (POPART, EudraCT 2018-004198-41).

While timing isn’t everything, timeliness is a big thing.
From a medicolegal perspective, “birth asphyxia” refers to the severest form of asphyxia, but in reality, perinatal asphyxia is a continuum, ranging from the prolonged and very severe to transient and milder forms caused for example by brief cord occlusions or strong uterine contractions. Irrespective of the severity, the initial physiological response to perinatal asphyxia is identical. Initially it involves bradycardia, apnoea, a mild hypertension and an inhibition of body movements, along with redistribution of cardiac output to increase blood flow and maintain oxygen supply to the heart and brain. As the asphyxia is prolonged, the response diverges depending upon the severity. With less severe reductions in oxygen, the increase in blood flow to the heart and brain maintain oxygen delivery to these vital organs to sustain their function. Apnoea and an inhibition of body movements prevail to reduce overall body oxygen consumption. If the asphyxia is severe, the increase in blood flow to the heart and brain is not sufficient to sustain oxygen delivery to these organs, which results in a gradual reduction in myocardial contractility that in turn causes a reduction in blood pressure. Eventually, blood pressure falls to a point where blood flow ceases, although electrical activity in the heart can continue for some time. While lung aeration and ventilation can rapidly restore cardiac function in the majority of cases, when blood pressures fall below ~20mmHg in newborn lambs, chest compressions are also required. However, when newborn lambs are asystolic or have a pulseless ECG signal with very low arterial pressures (<2mmHg), chest compressions cannot restore cardiac function without adrenaline administration. Adrenaline was most effective when given i.v., but in most cases was ineffective when given via the trachea and required multiple treatments. Intraosseous administration is an alternative approach which is under consideration. Restoration of spontaneous circulation is always preceded by increase in diastolic pressure and so it is unclear where volume loading is of an equal or an additional benefit to adrenaline. Nevertheless, caregivers should be very cognisant of the potential harm that a rebound tachycardia and hypertension can cause to the maximally vasodilated cerebral circulation during the recovery phase from severe birth asphyxia.
Deferral of umbilical cord clamping (DCC) has increasingly become the standard of care in the management of both term and preterm infants judged not to require resuscitation. Randomised clinical trials comparing DCC to immediate cord clamping have shown benefits both physiologically and in important clinical outcomes such as death before nursery discharge. The mechanism of benefit in DCC has been hotly debated. Possible candidates include a placental transfusion, the timing of cord clamping in relation to other events such as lung inflation, the benefits of volume and even the augmented transfer of stem cells to the infant. The concept of supporting the transition with the first step being deferral of cord clamping to allow the infant to breathe spontaneously thereby decreasing interventions at birth has also been raised as an important reason for benefit. Each of these possible contributors to the benefits of DCC will be examined and the relationships between them reviewed in this presentation.

 Delayed cord clamping (DCC) at delivery is rapidly becoming standard of care for managing newborns around the world. Most of the clinical trials that have explored the advantages of DCC however excluded those babies that required resuscitation. Evidence suggests that spontaneous breathing may augment the return of blood from the placenta during DCC. The question of whether giving assisted ventilation at birth augments placental transfer when compared to those apnoeic babies not given assisted ventilation is being tested currently. The feasibility of delivering this resuscitation in challenging clinical situations will be explored in this presentation.
FREE PAPERS
1330-1345
TITLE: THERMAL MANAGEMENT DURING NEONATAL RESUSCITATION
AUTHOR/S: M. L. McLanders, J. Domingo-Bates, P. M. Sanderson, C. Van Dyken
Liley
DEPARTMENT/ORGANISATION: School of Psychology, The University of Queensland, Mater Mothers’ Hospital, Mater Research Institute - The University of Queensland, Faculty of Medicine, The University of Queensland, School of ITEE, The University of Queensland

Introduction. Neonates, especially those of extremely (ELBW) and very low birth weight (VLBW), are vulnerable to cold stress and hypothermia during resuscitation, increasing risk of mortality and morbidity. All guidelines recommend maintaining normothermia during resuscitation and auditing neonatal unit admission temperatures to improve practice.

Aim. To investigate routine use of techniques to maintain normothermia during neonatal resuscitation.

Methods. Motion-activated video recording equipment installed in the neonatal resuscitation room in a tertiary maternity hospital in Brisbane, Australia was used to unobtrusively record resuscitation events. Adherence to each of 5 thermal management interventions was scored 0-2. Addition of sub-scores gave a thermal management score, with 10 being best possible.

Results. Fifty-four resuscitations were analysed. Fourteen of 22 ELBW or VLBW (64%), and 13 (48%) of low or normal birthweight neonates had temperatures <36.50 on neonatal unit admission. Admission temperature (M = 36.24, SD = 1.00) was correlated with birth weight (M = 1788g, SD = 750g; rs = 0.341, p = .012). ELBW/ VLBW neonates had higher thermal management scores (M = 7.05, SD = 1.15) than low and normal birth weight neonates (M = 5.93, SD = 0.72; U = 134, p = .001).

Conclusions. Half the neonates experienced cold stress or hypothermia on admission. Concordant with guidelines, teams used more thermoregulation interventions for ELBW/VLBW neonates, but these were not fully adhered to or effective. Low and normal birth weight neonates were also vulnerable and warrant more interventions. Video-recordings provided valuable insight into work-as-done and will be used for training thermal management.

1345-1400
TITLE: RESPIRATORY MONITORS TO TEACH NEWBORN FACEMASK VENTILATION: AN RCT
AUTHOR/S: E. O’CurraIn, M. Thio, J.A. Dawson, S.M. Donath, P.G. Davis
DEPARTMENT/ORGANISATION: Newborn Research Centre, The Royal Women’s Hospital Melbourne

Background: Face-mask leak during newborn resuscitation is common and impedes effective ventilation. Respiratory Function Monitors (RFM) provide real-time, objective leak and flow information during resuscitation. Our aim was to determine whether using a RFM during resuscitation training reduced mask leak. Health professionals attending a formal, structured newborn resuscitation training course neoResus (www.neoresus.org.au) were eligible to participate in the study.

Methods: This was a multi-centre, stratified, outcome assessor blinded, randomised controlled trial conducted in 13 hospitals in Victoria, Australia between May 2016 and October 2017. An RFM was added to standard training using a mannequin. Adult health professionals attending the neoResus course were eligible and were randomised to have the RFM display visible (intervention) or masked (control) during training. The primary outcome was facemask leak measured after the training session.

Results: 400 participants were randomized, 388 of which were analysed, consisting of 194 in each arm. Participants had a median (IQR) neonatal experience of 8 (3-17) years and 26% were doctors (102/388), 47% (182/388) were midwives and 27% were nurses (104/388). The post training leak was 22.7% (8.1-41.3) in the RFM visible group and 34.6% (13.6 – 67.4) in the masked group p<0.0001. The RFM visible group also had a higher expired tidal volume, 18.2ml (14.8-20.6) vs 14.9ml (10.7-18.6) p<0.0001.

Conclusion: The addition of an RFM to teach newborn mask ventilation helps reduce the operator’s facemask leak.
PLENARY ABSTRACTS CONT’D

TITLE: NEWBORN/INFANT RESUSCITATION: KNOWN UNKNOWNS AND UNKNOWN UNKNOWNS
Author: Dr Mark Tracy
DEPARTMENT: Westmead NICU & The Department of Paediatrics and Child Health, NSW
The delivery of appropriate and consistent tidal volumes and ventilation across device classes of self-inflating bag (SIB), flow dependent t-piece resuscitators and anaesthetic bags have been examined in bench test models, animal experiments and manikin studies.
Biomechanical performance differences between brands and between individual units of one brand have been reported. His work has challenged the concept that one type of device is suitable to provide positive pressure ventilation across the weight range of 500 grams to 10kgs quoted as operational for most devices. Particularly, significant and important differences has been discovered between brands of SIB leading to NSW health to issue a safety alert flowing publication of his research. www.health.nsw.gov.au/sabs/Documents/2018-sn-018.PDF
This presentation will detail the research.

TITLE: STARTING FIO2 – DO WE KNOW WHAT’S BEST?
AUTHOR: Dr Jennifer Dawson
DEPARTMENT/ORGANISATION: Newborn Research Centre/The Royal Women’s Hospital
The transition from foetus to newborn is a normal physiological and developmental process; most infants make the transition with very little assistance. However, some newborn infants, particularly those born prematurely, often need respiratory support including supplemental oxygen in a period following their birth. Over the last 30 years, recommendations from the International Liaison Council on Resuscitation (ILCOR) have reflected changes in practice in response to emerging evidence from clinical and animal studies. In 1992, ILCOR recommended, “Oxygen should be used. It is not toxic and there is no reason to be concerned”(ILCOR 1992). By 2005 the recommendation for using oxygen in the DR was not so straightforward the “Optimal oxygen concentration for newborn resuscitation is not known”(ILCOR 2005). Findings from important clinical trials by Ola Saugstad and Max Vento helped shape our knowledge about the effects of oxygen administration to newly born infants.
We have seen remarkable changes in our attitudes to the use of oxygen in the delivery room (DR). There has been a recognition that newborn infants are susceptible to oxidative stress and 100% oxygen can be harmful to both preterm and term infants.
In 2010 the ILCOR recommendation for infants born at term “For babies born at term it is best to begin resuscitation with air rather than 100% oxygen” (ILCOR 2010). In comparison, for preterm infants there was a modified approach to oxygen delivery “Many babies < 32 weeks gestation will not reach target saturations in air” (ILCOR 2010). In addition to recommendations regarding the amount of oxygen to use in the DR a role for pulse oximetry was included. “Blended oxygen and air may be given judiciously, ideally guided by pulse oximetry. Both hyperoxemia and hypoxemia should be avoided” (ILCOR 2010).
Fast forward to 2019. Is there any new evidence to guide practice? Are we any closer to the answer about when and how much oxygen to use in the delivery? Stay tuned.
Equipment designed for use during neonatal resuscitation and intensive care has improved the survival and outcomes of numerous babies, but the design of equipment can also create unexpected risks. An example is that default settings for alarms may be appropriate for one setting but very inappropriate for another. Another is that if usually highly dependable equipment does not perform as expected, the users may misinterpret this as a failure of patient physiology or human performance, rather than a failure of the equipment. The same applies to standard algorithms.

The user and the equipment (or decision aid) combine to form a system. Users’ shared knowledge of the performance and limitations of the system is important in building resilience to errors. This resilience can also be improved by structured, routine checking, by training that includes a focus on appropriate calibration of trust in the equipment, and on the availability and training in use of back-up equipment that is readily available for emergencies.

A simulation-based iterative, interaction design approach that includes clinical users and “stress tests” can support the development of better equipment. However, there can be important differences between bench tests, simulation and clinical performance. The presentation will focus on examples and strategies to improve equipment, how it is used and how we respond when it lets us down.
The principles that underpin immediate care for newborns are relatively simple – keep them warm; assess their condition quickly and regularly; and provide breathing support to those who may need it. Traditionally, these tasks have been performed using simple methods. Technology is increasingly available to monitor and support babies; however, it is unclear whether much of it is beneficial to them. Introducing technology comes at a cost, and many babies who need help at birth – whether asphyxiated term babies, or premature infants – are born in circumstances unlikely to be able to afford it. The role for technology needs to be defined before its widespread introduction.
NEONATAL SATELLITE MEETING
POSTER PRESENTATIONS
TITLE: IMPROVING INTUBATION SUCCESS IN TRANSPORT

AUTHOR/S: Dalrymple, Hannah1,2, Browning-Carmo, Kathryn1,3

DEPARTMENT/ORGANISATION: 1Newborn and Paediatric Emergency Transport Service (NETS) NSW, Sydney, Australia, 2Royal Prince Alfred Newborn Care, Sydney, Australia, 3Grace Centre for Newborn Intensive Care, CHW, Sydney, Australia

Background: Intubation is a life-saving procedure with fewer training opportunities than in the past and high complication rates. Data from transport medicine audit showed higher paediatric and neonatal first pass success rates from adult trained teams than paediatric or neonatal trained teams [1].

Methods: We performed a comparative intervention study in July to December 2018 using historical controls from 2017. The intervention included an intubation checklist and daily mannequin airway practice at the beginning of each teams shift. Data was obtained from the existing database regarding first pass intubation rates. Details not recorded in the database were obtained using a post-intubation questionnaire.

Results: Most clinical teams consented to involvement. There was a statistically significant improvement in first pass intubation rate from 58% to 74% (p = 0.4). This was largely due to improvement in neonatal intubations 58% to 78% (p = 0.03), rather than paediatric 58% to 65% (p = 0.65). This occurred despite low compliance with daily simulation protocol at 43.5%. Staff reported benefits in communication and teamwork around performing intubation on retrieval.

Conclusions: The intervention demonstrated qualitative benefits in communication and teamwork.


TITLE: TEACHING INTACT CORD RESUSCITATION TO BIRTH PRACTITIONERS

AUTHOR: T. Hewitt

ORGANISATION/CITY: Canterbury District Health Board, Christchurch, New Zealand

The evidence around deferred cord clamping has consistently demonstrated improved infant outcomes resulting from increased placental transfusion. Recent physiologic studies have discussed how maintenance of an intact cord until after onset of ventilation may limit the degree of further injury in the asphyxiated newborn1. While deferred cord clamping is now common for healthy term neonates, it cannot be safely implemented for babies that fail to breathe at birth without a knowledge of intact cord resuscitation (ICR). ICR is an innovative practice which can be taught as part of newborn resuscitation training to boost the confidence and understanding of birth practitioners. Demonstrating ICR and providing an opportunity to practice this skill may improve a practitioner’s ability to make rapid and appropriate decisions at birth about when and whether to transfer a baby to a resuscitation table. Teaching ICR is a relatively new practice for most educators and I will demonstrate how simulation training may be adapted to encourage health professionals to extend the time for placental transfusion, without compromising the newborn by delaying resuscitation. The implications are for a wider transfer of the message of ICR to the educators across the Australasian Region and the resulting improvement in neonatal outcomes. I am currently engaged in research for my Master of Midwifery investigating cord clamping at term vaginal births in New Zealand which will further add to our understanding of the practice.

TITLE: SMALLER FACEMASKS FOR POSITIVE PRESSURE VENTILATION IN PRETERM INFANTS: AN RCT

DEPARTMENT/ORGANISATION: Newborn Research Centre, The Royal Women’s Hospital, Melbourne, Victoria

Background: Effective facemask ventilation is often compromised by leak. Measurements of preterm infants’ faces suggest that the size of standard facemasks may not align with international recommendations. We aimed to compare a smaller 35mm or 42mm diameter facemask (Fischer & Paykel), with a standard 50 mm diameter facemask (Laerdal Size 0/0) when providing preterm facemask ventilation.

Methods: This randomized controlled trial was conducted at the Royal Women’s Hospital, Melbourne, Australia between September 2014 and February 2018. Preterm infants ≤32 weeks’ gestation receiving PPV prior to intubation in the NICU and those 28 to 32 weeks receiving PPV in the delivery room were eligible. Infants were stratified by gestational age and were randomly allocated a standard 50mm diameter mask (control) or a smaller mask (intervention); those ≤26 weeks corrected gestational age (CGA) a 35mm diameter mask and those 27 to 32 weeks CGA inclusive a 42mm diameter mask. The primary outcome was leak between the mask and the infant’s face.

Results: 298 infants were eligible for inclusion, 139 were randomized and 131 were included in the final analysis, 66 in the intervention and 65 in the control groups. The smaller facemasks did not reduce leak; the median (IQR) was 41.5 (13.2 to 69.2) % in the smaller facemask group compared with 39.2 (21.7 to 65.8) % in the control group p=0.43. There were no differences in important secondary outcomes

Conclusions: Smaller facemasks did reduce mask leak in preterm facemask ventilation.

TITLE: RELEVANCE OF VARIABLE PATTERNS OF NEONATAL SPO2 AFTER BIRTH FOR DESIGN OF ADVANCED DISPLAYS TO SUPPORT O2 TARGETING

AUTHOR/S: Zestic J1, Salisbury I1, Sanderson PM1, Dawson J2, Liley H1,3
DEPARTMENT/ORGANISATION: 1The University of Queensland, St Lucia, Australia, 2Royal Women’s Hospital, Melbourne, Australia, 3Mater Research Institute- UQ, South Brisbane, Australia

Background: Oximetry can guide O2 administration during neonatal transition after birth, and SpO2 centile graphs have been published for preterm and term neonates during that period. (1) However, it is unclear how best to use the centiles to guide the design of advanced information displays both to help clinicians achieve nominal O2 targeting during resuscitation and to improve realism of simulation training.

Methods: We reviewed records in the Dawson et al. (1) database and performed a visual categorisation of different patterns of SpO2 over time in the first 15 mins after birth.

Results: Of the 130 term neonates not given oxygen, 12% showed an SpO2 profile largely contained within the 25–75th SpO2 centiles, whereas 53% showed an oscillating pattern, 15% an early depression, and the remaining 20% various other patterns deviating outside the 25–75th centiles.

Conclusions: SpO2 of the individual neonate will reflect many underlying factors that are not directly sensed, and they reflect a changing physiology. To guide O2 administration via advanced displays, we need to gain a deeper understanding of clinicians’ informational needs in newborn resuscitation. Work Domain Analysis (WDA) is one way to define this information. Information gathered from the WDA can be used to inform the design of advanced displays which could reflect underlying physiology and guide treatment decisions.

SPARK OF LIFE CONFERENCE PROGRAM

FRIDAY 10 May 2019

0830–0840 Official Opening
(10min)
Chair: National Chairman
Prof Peter Morley

Plenary I
0840-0910 “Don Harrison Perpetual Lecture”
Richard Aickin

0910-1040 Progress updates (5x15 mins)
- Essential newborn care
  Susan Niermeyer
- Community involvement in CPR
  Andy Lockey
- Airway management
  Jerry Nolan
- Ventilation
  Theresa Olasveengen
- Adrenaline (drugs) and CPR
  Gavin Perkins

Question Time 15 mins

1040-1120 Morning Tea

Plenary II
1120-1320 The Basics (5x15 mins)
Chair: Michael Parr
- Cord clamping—it’s about time
  Colm O'Donnell
- Virtual reality — really!
  Federico Semeraro
- The roles of Social media
  Andy Lockey
- EMS Dispatch
  Theresa Olasveengen
- Aus-ROC Epistry - Update
  Judith Finn
- How does technology help you with evidence?
  Peter Morley

Panel Questions: 30 mins

1320-1400 Lunch

FREE PAPERS SESSIONS

Session 1: MEETING ROOM C3.3
Chair: Finlay Macneil

1400-1415 Ethnic Disparities in the Incidence and Outcome from Out-Of-Hospital Cardiac Arrest In New Zealand
Verity Todd

1415-1430 A Prehospital study of survival outcomes from out-of-hospital cardiac Arrest In ST-Elevation myocardial infarction in Queensland (the PRAISE study)
Brendan Schultz

1430-1445 International Variation in Survival after Out-Of-Hospital Cardiac Arrest: A Validation Study of The Utstein Template
Kylie Dyson

1445-1500 Short and Long-Term Survival Following In-Hospital Cardiac Arrest
Zakary Doherty
1500-1515 Trends in the Epidemiology of Out-Of-Hospital Cardiac Arrest Precipitated by Suspected Drug Overdose
Saeed Alqahtani

1515-1530 The Incidence and Outcomes of Out-Of-Hospital Cardiac Arrest Precipitated By Drug Overdose: A Systematic Review And Meta-Analysis
Saeed Alqahtani

Session 2:  – MEETING ROOMS C3.4 & C3.5  Chair: Kevin Nation

1400-1415 Intubation Performance by Airway Experts (Anaesthetists) in a Simulated Model of Cardiac Arrest with Continuous Chest Compressions – A Crossover Randomised Controlled Trial
Simon Ellis

1415-1430 Airway Management during Resuscitation for In Hospital Cardiac Arrest
James Penketh

1430-1445 Feasibility of using a Defibrillator to provide real-time and post-event Feedback to Paramedics on the quality of their CPR
Nicole Magnuson

1445-1500 How does PCI-capability of receiving-hospital impact on survival from Out-of-Hospital Cardiac Arrest? A New Zealand observational study
Graham Howie

1500-1515 Organ and Tissue Donation after Resuscitation from Cardiac Arrest
David Joughin

1515-1530 Initial findings after implementing the GOODSAM Mobile-Phone App to alert community responders to cases of suspected Cardiac Arrest
Tony Walker

Session 3:  – MEETING ROOM C3.6  Chair: Tracy Kidd

1400-1415 Improving Resuscitation Rates after Out-of-Hospital Cardiac Arrest -An Implementation Study
Paul MacIntyre

1415-1430 Increasing the uptake of Cardiopulmonary Resuscitation Training within Australian Cardiac Rehabilitation Programs: A National Implementation Study
Susie Cartledge

1430-1445 Results from the Heart Foundation’s Heart Watch Survey: Australian’s Awareness of Cardiac Arrest and Rates of CPR Training
Susie Cartledge

1445-1500 Cardiopulmonary Resuscitation (CPR) skills, knowledge, training, self-efficacy and willingness of laypeople: preliminary results from the Townsville CPR study
Matthew Riggs

1500-1515 Cardiopulmonary Resuscitation (CPR) skills over time and human versus Mannequin Assessment: Preliminary results from the Townsville CPR Study
Richard Franklin

1515-1530 Out-of-Hospital Cardiac Arrest Outcomes according to the level of training and the relationship to the patient of the person providing bystander CPR
Brian Haskin
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<td>1530-1600</td>
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<td>1600-1730</td>
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<td>Chair: Peter Morley</td>
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<td>Cervical collars/tourniquets - are they in or out? Jason Bendall</td>
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SATURDAY 11 May 2019

Plenary IV
0830-1030 (6 x 15 mins)

Chair: Michelle Murphy

- Patient and public involvement in research
  Gavin Perkins

- Is it safe?
  Rob Hackett

- PAD – who, where, when, how?
  Janet Bray

- What’s the prognosis Dr?
  Jerry Nolan

- Guidelines- what did we update?
  Kevin Nation

Panel questions 30 mins

1030-1100 Morning tea

Plenary V
1100-1300 (4 x 15 mins)

Chair: Michael Parr

- Neonatal resuscitation: surfactant and ECG
  Colm O’Donnell

- Paediatric Rapid Response Teams: When Needs are “Met”
  Jason Acworth

- What happened to TTM?
  Janet Bray

- VACAR-still improving outcomes
  Resmi Nair

Panel questions 10 mins

- Debate: Drugs are no use in cardiac arrest: For Theresa Olasveengen Against Jerry Nolan

- Improving bystander participation (25 mins)
  Kevin Nation / Andy Lockey

1300-1400 Lunch

Plenary VI
1400-1530 (5 x 15 mins)

Chair: Tracy Kidd

- Emerging experimental science- is it important?
  Theresa Olasveengen

- Good Samaritans and the law
  Craig Ray

- GoodSAM Community Responder App: The NZ Experience
  Bridget Dicker

- CPR and the Apps
  Federico Semeraro

- Lessons from the past
  Jerry Nolan

Panel questions 15 min

1530-1600 Afternoon tea

Plenary VII
1600-1650 (3x15mins)

Chair: Peter Morley

- The next big thing for little things
  Susan Niermeyer

- What next for cardiac arrest research?
  Gavin Perkins

- Restart a heart day-2019
  Federico Semeraro / Andy Lockey / Kevin Nation

Wrap up

1650 - 1700 Closing remarks

Peter Morley
A/Professor Jason ACWORTH

Jason is the Director of Paediatric Emergency Medicine at the Queensland Children’s Hospital. Jason has a long-held passion for paediatric resuscitation and simulation education. His current research work is focussing on paediatric rapid response systems in Australia and New Zealand. He is the current President of Advanced Paediatric Life Support Australia, is a paediatric representative on the Australian Resuscitation Council and is a member of the State Council of St John Ambulance Queensland. Jason has co-authored over 40 publications in peer reviewed journals. He was a part of the group that established the PREDICT (Paediatric Research in Emergency Departments International Collaborative) paediatric emergency research network, serving as its Chair in 2008-2009. He was also Chair of the international Paediatric Emergency Research Network (PERN) in 2010.

A/Professor Jason BENDALL

A/Prof Jason Bendall is the Deputy Director of Training & Deputy Chair of the Medical Advisory Panel for St John Ambulance Australia. Jason is a Specialist in Anaesthesia and Prehospital & Retrieval Medicine at John Hunter Hospital Newcastle. Jason is the Convener of ANZCOR First Aid sub-committee and is a member of the ILCOR First Aid Task Force.

A/Professor Janet BRAY

Associate Professor Bray (Monash University, Melbourne, Australia) is a Heart Foundation Fellow, Associate Director of the Australian Resuscitation Outcomes Consortium (Aus-ROC), a ILCOR EIT Task Force Member, Council Member for the ARC, and Editorial Board Member for Resuscitation.

Her research program is focused on improving outcomes for acute cardiovascular events (i.e. cardiac arrest, heart attacks and strokes) through improving: 1) patient recognition and response to acute symptoms and 2) diagnosis and emergency care.
Professor Julie CONSIDINE

Professor Julie Considine holds a joint appointment between Deakin University and Eastern Health, one of Victoria’s largest health services. Julie is a leader in emergency nursing research and education with a particular interest in evidence-informed emergency care. Julie has over 160 publications and has attracted over $5.2M in research and project funding. She is a founding fellow of the College of Emergency Nursing Australasia and fellow of the Australian College of Nursing. Julie is Deputy Editor of the Australasian Emergency Care, represents the College of Emergency Nursing Australasia on the Australian Resuscitation Council, and is a member of the International Liaison Committee of Resuscitation Basic Life Support TaskForce.

Professor Bridgett DICKER

Prof. Bridget Dicker is the Head of Audit and Research for St John and concurrently serves as a Senior Lecturer at Auckland University of Technology. Prof. Bridget Dicker has made a significant contribution to the field of out-of-hospital emergency care with a focus on resuscitation. She developed and manages the inaugural New Zealand out-of-hospital cardiac arrest registry, established for research into epidemiological, systems, or clinical factors that may contribute to improved outcomes.

Professor Judith FINN

Judith is Director of the Prehospital, Resuscitation and Emergency Care Research Unit (PRECRU) in the School of Nursing, Midwifery and Paramedicine at Curtin University (Perth, Western Australia). She is also Director of the Australian Resuscitation Outcomes Consortium (Aus-ROC) – a NHMRC Centre of Research Excellence administratively based at Monash University (Melbourne, Victoria). Judith is the immediate past Co-Chair of the ILCOR “EIT - Education, Implementation and Teams” Task-force.

Dr Robert HACKETT

Dr Rob Hackett is a senior consultant Anaesthetist who works across several large hospitals in Sydney. He has a passion for human factors science and the system safety approach. He is a director of The PatientSafe Network - a non-for-profit charity providing a framework for working together to create the best environment for patient care.
Professor Peter MORLEY

Peter Morley is Chairman of the Australian Resuscitation Council and represents ANZICS on the ARC. Peter has been an Editorial Board member and Evidence Evaluation Expert for the ILCOR international consensus process for resuscitation science in 2005, 2010, and 2015. Peter now holds the position of ILCOR Treasurer.

Dr Resmi NAIR

Dr. Resmi Nair, a former academic, currently working in data analytics area. Her main interests include machine learning, artificial intelligence technologies, out-of-hospital cardiac arrest management and outcome and pre-hospital care. In her current role, Resmi manages Victorian Ambulance cardiac Arrest Registry (VACAR) database. Also involved in a number of research and evaluation projects aim to improve pre-hospital patients’ care and operational efficiency.

Mr Kevin NATION

Kevin is the Chief Executive of the NZ Resuscitation Council. His involvement with the Council has spanned more than 10 years and has including setting strategic direction, general management of operations, and developing education and training programmes. Kevin’s experience includes that of senior nurse in clinical cardiology, resuscitation educator at Waikato Clinical Campus and he chairs the NZ Resuscitation Council Advanced Life Support Instructors Association (CINZ). He is a past member of the International Liaison Committee on Resuscitation’s (ILCOR) Basic Life Support Task Force and currently is ILCOR Domain Lead for airway and ventilation.

Professor Michael PARR

Michael Parr is Deputy Chair / Secretary-Treasurer and Chair of the ALS Sub-Committee of the ARC (representing the Australian & New Zealand College of Anaesthetists). Michael trained in the UK, New Zealand, USA and Australia. He is Director of Intensive Care at Liverpool Hospital, and at Macquarie University Hospital. He is an editor of ‘Resuscitation’ and a member of ILCOR ALS subcommittee.
Professor Gavin PERKINS

Gavin Perkins is Professor of Critical Care Medicine at the University of Warwick and National Institute for Health Research Senior Investigator. He is Director of Warwick Clinical Trials Unit and an active researcher in emergency and critical care trials. Clinically he holds appointments as a Consultant Physician in Critical Care Medicine at University Hospitals Birmingham and MERIT Team Consultant with West Midlands Ambulance Service. Prof Perkins is co-chair of the International Liaison Committee on Resuscitation, Director of Guidelines and ILCOR with the European Resuscitation Council and Chair of the Resuscitation Council (UK) Community and Ambulance Resuscitation Committee. His portfolio of work includes the National Out of Hospital Cardiac Arrest Outcomes (http://warwick.ac.uk/ohcao). the PARAMEDIC trials (PARAMEDIC-1, mechanical CPR, PARAMEDIC-2, adrenaline for cardiac arrest).

Mr Craig RAY

Craig is the Principal of the Craig Ray & Associates Law firm in Queensland. Craig joined the ARC in 2018 as a Consumer Representative and his involvement has been of great value. He is President of the Child Accident Prevention Foundation of Australia and Chair of the Governance Committee for Scouts Australia. Also, for many years Craig has provided pro bono services and advice to community organisations such as Scouts Australia, Scouts Queensland, Community Supporting Police in Queensland, the Friends of Newstead House and the Volunteer Rifle Association PNG.

A/Professor Dion STUB

A/Prof Dion Stub graduated from Monash University in 2003 and undertook cardiology training, at The Alfred Hospital. Dion has particular interest in treating the cardiac emergencies of myocardial infarction and cardiac arrest and was awarded his PhD in 2013 developing Australia’s first treatment pathway for patients with refractory cardiac arrest, through combined research at the Baker IDI Heart and Diabetes Institute and The Alfred Hospital.

Dion has published extensively and delivered multiple presentations in both cardiac emergencies and structural heart intervention, and has been internationally recognized for his research. He currently holds the prestigious National Heart Foundation Fellowship to support his clinical research. He is an Associate Professor with Monash University and Baker IDI Heart and Diabetes institute, medical advisor to Ambulance Victoria and representative on Australia Resuscitation Council.
Laerdal Upright Resuscitator

Delivering adequate ventilations during those critical moments of a newborn resuscitation event can be challenging. The Laerdal Upright Resuscitator for Newborns has a new innovative design that has been shown to help deliver more adequate ventilations per event than a standard resuscitator¹.

¹ Data on file, Laerdal Global Health, 2014
ABSTRACTS

SOL CONFERENCE
Plenary and Free Paper Presentations
TITLE: ESSENTIAL NEWBORN CARE
AUTHOR: Susan Niermeyer

Essential newborn care includes basic neonatal resuscitation, maintaining warmth, establishing early and exclusive breastfeeding, preventing infection and also recognizing danger signs and treating potentially serious bacterial infections. Although it sounds mundane, essential newborn care actually holds some of the greatest potential for improving newborn outcomes. These outcomes can set a child on the trajectory to thrive throughout an entire lifetime.

Anticipatory guidance/behavior change communication to convey the value of key interventions for well babies: immediate skin-to-skin care, delayed umbilical cord clamping early initiation of breastfeeding. Survival advantages associated with these interventions (decreased mortality, reduced need for resuscitation, prevention of infection) exert a strong effect whether in under-resourced or highly developed settings. Basic resuscitation with emphasis on thorough drying, maintaining thermal stability, clearing the airway only when needed, stimulation to breathe (with delayed cord clamping for at least a minute) can often avert the need for bag and mask ventilation or more advanced interventions.

Family-centered, nurturing care begins with The Golden Hour of uninterrupted skin-to-skin contact. Early initiation of breastfeeding predicts production of adequate milk volumes and sustained duration of breastfeeding. Early physical contact and continued responsive caregiving not only provide developmental advantages to the child, but improved mental health outcomes for parents. Kangaroo mother care, developed to improve survival of preterm infants where incubator care was not possible, has now been shown to have developmental and psychological advantages for all newborns and their families.

TITLE: COMMUNITY INVOLVEMENT IN CPR
AUTHOR: Andy Lockey

Emergency Department, Calderdale & Huddersfield NHS Trust, Halifax, UK

Members of the public have a vital role to play in the chain of survival. By recognising a cardiac arrest, calling for help, starting cardiopulmonary resuscitation (CPR) and fetching and using a publicly accessible defibrillator before the arrival of the emergency medical services, they can help save lives. Increased bystander CPR rates are associated with increased survival rates. This has been demonstrated in Denmark where bystander CPR rates doubled over five years and survival rates trebled over this same period.

The challenge remains of how to successfully deliver training, particularly in a system that hasn't yet decided to make CPR training mandatory on the school curriculum like Denmark. There are many ways that training can be delivered to the community, with many attendant advantages and disadvantages.

The English Parliament in Westminster recently took the important step of mandating that CPR training and AED awareness will be part of the state school curriculum from 2020. The speaker will share his experience of lobbying for this change over the last 10 years and the numerous ‘Plan Bs’ that were put into place in the interim. He will share the highs and the lows of the journey as well as highlighting the benefits of a national ‘Restart a Heart’ initiative.
TITLE: AIRWAY MANAGEMENT

AUTHOR: Jerry Nolan
Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath UK

Several observational studies have documented an association between use of bag-mask ventilation and better outcome in comparison with use of either an SGA or tracheal tube but these studies have a high risk of selection bias.

Three randomised clinical trials involving airway management in out-of-hospital cardiac arrest were published in 2018. A non-inferiority trial of bag-mask ventilation versus tracheal (CAAM Study) found no difference in favourable functional outcome at day 28 and was deemed inconclusive. A cluster randomised trial of the laryngeal tube (LT) versus tracheal intubation (PART) reported better 72-h survival with the LT but a cluster randomised trial of the igel versus tracheal intubation (AIRWAYS-2) documented no difference in functional outcome at hospital discharge.

The ideal airway management strategy during CPR remains unclear. In practice, there is often a progression in complexity of airway management, from no intervention (compression-only CPR), mouth-to-mouth, and bag-mask ventilation, through to supraglottic airway (SGA) devices and tracheal intubation. The best airway is likely to vary depending on the time-point in the resuscitation process, and the skill set of the attending rescuer. A key message is to ensure high quality chest compressions and minimise any interruptions for airway intervention.

TITLE: VENTILATION

AUTHOR: Theresa Olasveengen
Oslo University Hospital, Oslo, Norway

The last decade has seen a lot of focus on resuscitation quality from resuscitation researchers and educators alike. But while the impact of high-quality chest compressions has been studied extensively, the role of ventilation and oxygenation remains less clear. Following the publication of a large North-American 23 711 patient randomized controlled trial on ventilation during continuous vs. interrupted chest compressions, the importance of ventilation strategy has been increasingly recognized and debated. Not only are we still not sure how to best secure the airway, we still lack clear guidance on what to do with that airway.

It is obvious that cardiac arrest patients will eventually need additional oxygen supply, and it is likely that there is some threshold where removal of carbon dioxide will also become a priority – but what are these thresholds? And how should we manage ventilation during and immediately after cardiac arrest? Does anyone really know?

Current treatment guidelines are based on uncertain evidence, and it may be useful for resuscitationists to not only know the evidence behind our current recommendations, but also reflect on the potential effects of various ventilation strategies on peri-arrest circulation. What is the cost of striving for normal ventilatory targets – and is it worth the price our patients may be paying?
TITLE: ADRENALINE (DRUGS) AND CPR
AUTHOR: Gavin Perkins

Adrenaline has been used as a treatment for cardiac arrest for decades despite equivocal evidence about its safety and effectiveness.¹ This talk will explore the historical use of adrenaline from its first use in experimental models through to the current evidence base and draft ILCOR recommendations.² The PARAMEDIC 2 trial, a randomised, placebo-controlled trial, enrolled 8016 with out of hospital cardiac arrest.³ Participants were randomised to 1 mg adrenaline every 3-5 minutes or placebo. The trial found that adrenaline improved the rate of return of spontaneous circulation (26.3% versus 11.7%). Survival to 30 days was higher in the adrenaline group (3.2% vs 2.4%) but survival with a favourable neurological outcome was similar (2.2% vs 1.9%). This is explained as a higher proportion of patients surviving with a poor neurological outcome in the adrenaline group. The discordance between improved survival and neurological outcomes divides opinion on whether adrenaline is useful as a treatment for cardiac arrest. It should prompt wider discussion amongst communities at risk of cardiac arrest to help guide policy makers to decide on future treatments. The trial serves as a reminder of the importance of earlier parts of the chain of survival as early recognition of cardiac arrest and activating emergency services is 10 times more effective, bystander CPR (8 times more effective) and early defibrillation (20 times more effective).

Funding acknowledgement: This project was funded by the NIHR HTA Programme (ref 12/127/126). The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.

References

TITLE: CORD CLAMPING – IT’S ABOUT TIME
AUTHOR: Prof Colm O’Donnell

National Maternity Hospital; University College Dublin; National Children’s Research Centre, Dublin, Ireland

Umbilical cords have been clamped hundreds of thousands of times a day for hundreds of thousands of years. One might expect that the timing of division would not be contentious. However, clamping the umbilical cord immediately after birth – a practice prevalent for 50 years – deprives babies of a significant amount of their blood that remains in the placenta, while clamping it later allows for continued transfusion of blood to the infant. Clinical trials demonstrate that clamping the cord at 1 – 3 minutes haemoglobin and iron stores in well term babies increases. Meta-analysis of clinical trials shows that aiming to clamp the umbilical cord 30 -180 seconds after birth reduces in-hospital mortality in preterm babies. In experimental animals, lung aeration causes a large increase in pulmonary blood flow that diverts blood from the systemic circulation. Clamping the cord after lung aeration allows the placental circulation maintain venous return and ventricular preload, enabling a smooth transition. Future studies should focus on cord clamping relative to the onset of lung aeration, rather than focus on a specific time after birth. This will be challenging for babies who do not breathe effectively after birth, as they will have to receive breathing support while still attached to the umbilical cord.
Virtual reality (VR) may represent a powerful tool for cardiopulmonary resuscitation (CPR) training. The addition of VR to traditional medical trainings improve sense of immersion and may increase skills acquisition and retention. Italian Resuscitation Council (IRC) produced a very innovative and challenging project called “VR CPR”.

The aim of this project is to create a full self-directed learning platform for BLS and AED training in VR. Virtual Reality CPR (VR CPR) is the new learning project from Italian Resuscitation Council. VR CPR was developed by IRC and Studio Evil with the support of several sponsor. The VR CPR platform include three different scenarios with different target groups: adult out-of-hospital chest compression only scenario, adult in-hospital basic life support scenario and out-of-hospital pediatric life support scenario. During every scenario “the player” can select three different types of AED: Philips Heartstart FR3, Zoll AED 3, Physio Control Lifepak CR2, in order to get used to with any potential branded–AED he/she may use in a real instance.

The scenarios are structured with a “gamification” approach measuring “the player’s” quality CPR and with the aim to teach the correct procedure of BLS. During every scenario the performance of the player is recorded with the motion detection technology analysis and compared with that from other players. The main quality CPR factors are measured accordingly to the ERC 2015 guidelines. The platform was developed for Oculus Go and HTC Vive, the two main VR devices on the market.

Over the last 10 years, the use of social media has significantly increased. The vast majority of people own a smartphone; some own even more than one. Whereas Social Media used to be used primarily for messaging, it is increasingly being used for marketing and advocacy.

In July 2018, there were over 2,270 million users of Facebook, with similar numbers using other platforms such as YouTube, WhatsApp, and Instagram.

There are numerous benefits to the use of social media. It is ideal for networking and sharing information in real time with a wide audience. There are also particular benefits allied with use during conferences, such as ‘Spark of Life’.

These benefits need to be balanced however against the disadvantages and risks of social media. The term ‘fake news’ has received prominence in recent years, and concerns have been raised about the use of social media to influence important outcomes.

This talk will cover the advantages and disadvantages of social media use for the resuscitation community and share an important strategy guaranteed to ensure you do not place yourself at risk.
The role of emergency medical dispatch (EMD) in out-of-hospital cardiac arrest is increasingly being recognized as an underutilized resource in a number of ways. From merely being the recipient of a bystander's call for an ambulance, we are recognizing that the EMD has a pivotal role in helping diagnose emergencies, initiate resuscitation and support lay rescuers in optimizing these resuscitation efforts. As health care professionals they have access to increasing resources, and new technologies and innovations keep changing their role within our emergency medical services (EMS) systems.

Many EMD systems are now able to map out the nearest Automated External Defibrillators (AEDs), and some can even dispatch additional nearby volunteer lay rescuers to bring an AED to the caller. There is ongoing work to provide real-time video coaching to callers, deliver AEDs by use of drones and develop technology to allow dispatchers to monitor real-time lay rescuer resuscitation quality. Researchers are even developing artificial intelligence or machine learning networks to improve accuracy of cardiac arrest detection.

The EMD centers are increasingly contributing to our prehospital systems of care, and they hold the keys to ensure we are utilizing all our combined resources – from hard core professionals to everyday lay rescuer heroes.

This paper will present an update on the status of the Aus-ROC Australian and New Zealand (Aus/NZ) out-of-hospital cardiac arrest (OHCA) Epistry. Currently the Epistry has almost 100% coverage across Aus and NZ – with data contributed by Ambulance Victoria, SA Ambulance Service, St John Ambulance WA, Queensland Ambulance Service, St John Ambulance NT, NSW Ambulance Service and Ambulance Tasmania, St John NZ and Wellington Free Ambulance, with ACT expected to join in 2019.

Our first descriptive paper (Beck et al, 2018) reported the OHCA patient characteristics, clinical management and survival outcomes for nearly 20,000 OHCA cases in 2015; with data submitted from 7/10 ambulance services across Aus/NZ. For the first time we were able to accurately estimate the incidence of OHCA in Aus/ NZ (around 100 per 100,000 population); and examine differences between ambulance services in OHCA prognostic determinants, such as bystander CPR and survival outcomes (Return of Spontaneous Circulation (ROSC) and survival to hospital discharge/30-day survival).

We continue to strive to harmonise OHCA data between individual OHCA registries, according to the Utstein definitions. Our next paper will focus on risk adjustment of survival outcomes to better define the factors that underpin the differences in survival outcomes between ambulance services. Other planned studies include sub-group analyses and spatio-temporal analyses.

The Aus-ROC Aus/NZ OHCA Epistry demonstrates the collaborative spirit between ambulance services across Australia and New Zealand and the united goal to improve patient outcomes after OHCA.
FREE PAPERS
NZ has an ethnically diverse population with known health inequities between ethnic groups. We investigated whether disparities existed in the incidence and outcome from out-of-hospital cardiac arrest (OHCA).

A retrospective observational study was conducted using two years of St John OHCA registry data (1/11/2016-31/10/2018) linked to mortality and ethnicity from Ministry of Health National Health Index. Population data was obtained from Statistics NZ and Ministry of Health primary healthcare organisation enrolments. Ethnic groups investigated were Māori, Pacific Peoples and Europeans/Other. Incidence rates, population characteristics and outcomes for Māori and Pacific peoples were compared to the European/Other group. Return of spontaneous circulation (ROSC) at handover and 30-day survival were investigated using logistic regression.

OHCA incidence rates per 100,000 person-years were higher in Māori (157.8) and Pacific Peoples (127.7) compared to Europeans (102.1). A higher proportion occurred in females in Māori (37.7%) and Pacific Peoples (34.2%), compared to Europeans (29.1%) (p<0.001). In Māori and Pacific Peoples a greater proportion occurred in under 65-year-olds (p<0.001). ROSC at handover was lower in Māori (adjusted OR 0.74, 95% CI (0.64 to 0.87), p<0.001). Survival to 30 days was lower for Māori (adjusted OR 0.61, (0.48 to 0.78), p<0.001) and Pacific Peoples (adjusted OR 0.52, (0.37 to 0.72), p<0.001).

Significant ethnic disparities in incidence and outcome from OHCA exist within NZ. Māori and Pacific Peoples have a higher incidence of OHCA, are younger, more likely to be female, and have the lowest survival to 30 days. Our findings provide impetus for targeted health strategies.

### Title: Survival of Patients with Out-of-Hospital Cardiac Arrest Following ST-Elevation Myocardial Infarction Treated by Ambulance Paramedics

**Author(s):** B Schultz, T Doan, S Rashford, B Rogers, E Bosley

**Background.** Patients suffering out-of-hospital cardiac arrest (OHCA) in the context of a ST-elevation myocardial infarction (STEMI) represent a unique cohort who may benefit from targeted prehospital management. Data on the characteristics and survival of this important subset of OHCA patients are limited.

**Methods.** Retrospective analysis of data sourced from the OHCA registry of the Queensland Ambulance Service (QAS), Australia. Adult patients (≥ 18 years of age) who experienced OHCA of suspected cardiac aetiology following paramedic-identified STEMI, between January 2013 and December 2017 in Queensland, were included. A multivariate logistic regression analysis was performed to identify factors influencing event survival (return of spontaneous circulation [ROSC] sustained to hospital handover).

**Results.** A total of 287 patients were included; of these, 219 (76%) survived the event. Important determinants of survival include initial cardiac arrest rhythm of VF/VT (ventricular fibrillation/ventricular tachycardia), administration of reperfusion medications by paramedics, and emergency phone call (000) made inside business hours (9:00 – 17:00 from Monday to Friday), which increase the odds of surviving the event by 8.6 (95% CI 4.1 – 17.9), 2.1 (1.1 – 4.2) and 2.2 (1.1 – 4.7) times, respectively.
**Conclusions.** This study is the first in Australia to investigate the outcomes of OHCA patients following STEMI identified and treated by paramedics. Our study demonstrates excellent event survival for this unique cohort of OHCA patients. The findings support the important role of rapid administration of reperfusion medications by paramedics.

**TITLE: INTERNATIONAL VARIATION IN SURVIVAL AFTER OUT-OF-HOSPITAL CARDIAC ARREST: A VALIDATION STUDY OF THE UTSTEIN TEMPLATE**

**Centre for Research and Evaluation, Ambulance Victoria, Melbourne, Victoria**

**Introduction:** Out-of-hospital cardiac arrest (OHCA) survival varies greatly between communities. The Utstein template was developed and promulgated to improve the comparability of OHCA outcome reports, but it has undergone limited validation. Our objective was to assess how much the Utstein data elements explain the variation in OHCA survival between emergency medical services (EMS) across the globe. Our secondary aim was to assess how accurately the Utstein data elements predict OHCA survival.

**Methods:** We performed a retrospective analysis of patient-level prospectively collected data from 12 OHCA registries from 12 countries for the period 1 Jan 2006 through 31 Dec 2011. Using the Utstein template, we used generalized linear mixed models to examine the variation in survival between EMS agencies that were under a single medical direction (n=232).

**Results:** Twelve registries contributed 86,759 cases. Patient arrest characteristics, EMS treatment and patient outcomes varied across registries. Overall survival to hospital discharge was 10% (range, 2% to 22%). Overall survival with cerebral performance category ≤2 (available for 9/12 registries) was 8% (range, 2% to 20%). The area-under-the-curve for the Utstein model was 0.85 (Wald CI: 0.85-0.85), while 51% of the variation in outcomes was explained by Utstein factors.

**Conclusions:** The Utstein factors explained 51% of the variation in survival to hospital discharge among multiple large geographically separate EMS agencies. These findings suggest that quality improvement and public health efforts should continue to target modifiable Utstein factors to improve OHCA survival. Further study is required to identify the reasons for the variation that is incompletely understood.

**TITLE: SHORT AND LONG-TERM SURVIVAL FOLLOWING IN-HOSPITAL CARDIAC ARREST**
**AUTHOR/S: Z.Doherty, R.Kippen, B.O’Sullivan, J.Fletcher, K.Fuzzard, C.Knott**

**Monash University, Bendigo, Victoria**

**Introduction:** Much is known about the short-term survival of patients who suffer an in-hospital cardiac arrest (IHCA) in Australia and internationally. However, beyond hospital discharge there is little data about the survival of these patients, particularly in the Australian context. This study describes both short- and long-term survival of patients following an IHCA.

**Methods:** Using an existing cardiac arrest registry at a large regional Australian hospital, all adults who suffered an IHCA between 2000 and 2017 were linked to the state death registry. We investigated the association between patient and arrest characteristics, and the outcomes of (1) event survival, (2) survival to discharge and (3) survival beyond discharge, using multivariate logistic regression and Cox survival analysis. In addition, long-term mortality of the IHCA cohort was compared to that of the standard Australian population matched by age, sex and year.
**Results:** 682 patients were included in the final analysis. The median follow-up was 3.9 years post-arrest. Survival of the event was 54.5% and survival to discharge was 31.8%. At 1 year post arrest, 21.1% of the total cohort were alive. When compared to the standard Australian population, annual mortality of the IHCA cohort was significantly higher for the first 10 years post arrest. Patient age, arrest rhythm and duration of resuscitation were significantly associated with long-term survival.

**Conclusion:** Whilst short-term survival following IHCA is poor, a large proportion of patients who survive to discharge survive long-term. This is the first Australian study to describe survival beyond 1 year following an IHCA.

**TITLE TRENDS IN THE EPIDEMIOLOGY OF OUT-OF-HOSPITAL CARDIAC ARREST PRECIPITATED BY SUSPECTED DRUG OVERDOSE**

**AUTHOR/S:** S Alqahtani, Z Nehme, B Williams, S Bernard K Smith

**Department of Emergency Community Health and Paramedic Practice, Monash University, Melbourne, Victoria**

**Background:** Little is known about the long-term trends in the incidence and outcomes of drug overdose out-of-hospital cardiac arrests (OHCA).

**Method:** Between 2000 and 2017, we retrospectively reviewed drug overdose OHCAs from the Victorian Ambulance Cardiac Arrest Registry. Incidence was assessed using linear regression, and the baseline characteristics and survival outcomes were assessed using nonparametric test for trend. Arrest factors associated with survival to hospital discharge were assessed using logistic regression. The 12-month functional recovery and health related quality of life for survivors was summarised using descriptive statistics.

**Results:** The incidence of emergency medical services (EMS)-attended and EMS-treated cases was 5.8 and 2.0 per 100,000 person-years, respectively, with no significant changes in trend over time. Return of spontaneous circulation increased from 23% to 34% (p for trend = 0.001), event survival increased from 23% to 30% (p for trend = 0.007), and survival to hospital discharge increased from 4% to 13% (p for trend = 0.03). Age, arrest witnessed by bystander or EMS, initial shockable rhythm or pulseless electrical activity, intubation, epinephrine and sodium bicarbonate administration were independently associated with survival. The adjusted-temporal trend for survival was not significant (per year increase; OR 1.02, 95% CI: 0.98, 1.07; p=0.244). Of the 12-month survivors, 50% of the responders reported good functional recovery, and few reported severe problems with mobility, self-care, daily activity, pain, and anxiety/depression.

**Conclusion:** Although the incidence of drug overdose OHCA remained unchanged between 2000 and 2017, the rates of survival have significantly improved.

**TITLE: THE INCIDENCE AND OUTCOMES OF OUT-OF-HOSPITAL CARDIAC ARREST PRECIPITATED BY DRUG OVERDOSE: A SYSTEMATIC REVIEW AND META-ANALYSIS**

**AUTHOR/S:** S Alqahtani, Z Nehme, B Williams, K Smith

**Department of Emergency Community Health and Paramedic Practice, Monash University, Melbourne, Victoria**

**Background:** Out-of-hospital cardiac arrests (OHCA) precipitated by drug overdose (OD) are becoming an increasing public health problem in developed countries. Empirical data on the global incidence and outcomes are needed to guide preventive and treatment strategies.

**Methods:** We conducted a systematic review using MEDLINE, Embase, CINAHL and EBM Reviews and CINAHL to identify observational or interventional studies reporting the incidence or outcomes of adult OHCA precipitated by drug OD between 1990 and 2018. Pooled incidence rates per 100,000 person-years and survival outcomes were summarised using random-effects models.

**Results:** Twelve articles met the eligibility criteria, of which six were from North America, four from Europe and two from Asia. Only two studies reported the incidence of EMS-attended cases.
The pooled incidence of Emergency Medical Services (EMS)-treated OHCA was 1.4 cases per 100,000 person-years. The pooled rate of survival to hospital discharge and survival with favourable neurological outcome was 9% (95% CI: 6%, 12%; I² = 90%; p < 0.001) and 6% (95% CI: 2%, 13%; I² = 81%; p < 0.001), respectively. The pooled rate of return of spontaneous circulation was 25% (95% CI: 11%, 41%; I² = 97%; p < 0.001). Drug OD OHCA was associated with an improvement in the odds of survival to hospital discharge (pooled odds ratio 2.2, 95% CI: 1.7, 2.7; I² = 0.0%; p < 0.45).

Conclusion: The incidence and survival outcomes of drug OD OHCA varies substantially across regions. Effective strategies designed to reduce incidence and improve survival outcomes are needed.
SESSION 2 – MEETING ROOMS C3.4 & C3.5 - 1400 - 1530

TITLE: INTUBATION PERFORMANCE BY AIRWAY EXPERTS (ANAESTHETISTS) IN A SIMULATED MODEL OF CARDIAC ARREST WITH CONTINUOUS CHEST COMPRESSIONS – A CROSSOVER RANDOMISED CONTROLLED TRIAL

AUTHOR/S: S W G Ellis, B D Pons, J C Bendalla
a. Department of Anaesthesia, John Hunter Hospital, Lambton Heights, NSW, Australia,  b. University Department of Rural Health, University of Newcastle, Taree, NSW, Australia

Background: Optimal airway management during cardiopulmonary resuscitation is unknown. Endotracheal intubation (ETI) enables chest compressions to continue uninterrupted while the lungs are ventilated and protects the lungs from aspiration. Videolaryngoscopy (VL) for ETI may have a role during CPR. This study describes the performance of anaesthetists performing ETI during a simulated cardiac arrest during continuous chest compressions.

Methods: A prospective, randomised, cross-over trial was conducted at John Hunter Hospital, NSW, Australia. Participants (anaesthetists) were required to intubate a high-fidelity manikin during continuous mechanical chest compressions using a ‘scope-bougie-tube’ technique. Participants were randomised initially to either direct laryngoscopy (DL) or video laryngoscopy (VL). The task was repeated with the alternate device. The primary outcome was speed of successful intubation.

Results: Participants had limited prior experience intubating during cardiac arrest and an a priori preference for using a VL for intubation during CPR. All participants successfully and quickly intubated the trachea with using both DL and VL (19s (IQR 14-25) and 21s (IQR 14-31) for DL and VL respectively). The median time to first ventilation was 37s (IQR 26-41) for DL and 41s (33-65) for VL (p=0.03).

Conclusion: Anaesthetists were all able to intubate the trachea and establish ventilation promptly during continuous chest compressions with 90% doing so within 92 seconds. Ventilation was established faster when using a direct laryngoscope compared to using a McGrathTM MAC Video Laryngoscope.

TITLE: airway MANAGEMENT during RESUSCITATION FOR in Hospital Cardiac Arrest

AUTHOR/S: Penketh JA, Reynolds E, Parr M, Nolan J, Aneman A
Department of Intensive Care Medicine Liverpool Hospital, Sydney, NSW

Background: The International Liaison Committee on Resuscitation (ILCOR) has identified defining the optimal method of ensuring airway patency during in-hospital cardiac arrest as a specific knowledge gap. Advanced airways have been associated with both benefit and harm. Aims: To determine the type of airway devices used during in-hospital cardiac arrest resuscitation attempts.

Methods: International multicentre retrospective observational study of in-patients aged over 18 who received chest compressions for cardiac arrest (Jan 2017-Dec 2018). Patients were identified from national registries and rapid response systems databases. Data were collected through review of resuscitation records and hospital notes. Airways used during cardiac arrest were recorded as basic (adjuncts or bag valve mask), supraglottic airway (SGA) devices, endotracheal tubes (ETT) or tracheostomies. Descriptive statistics were used for initial analysis.

Results: Of 174 identified, 154 patients with complete data records were included for analysis. Airway devices used during cardiac arrest were: No airway 5(3%), basic airways alone 38(25%), SGA 78(51%), ETT 29(19%). Patients who achieved ROSC; no airway 5(5%), basic airways alone 20(22%), SGA 31(34%), ETT 13 (14%). Patients without ROSC; basic airway alone 18(23%), SGA 42(53%), ETT 17(21%). The use of ETT was not associated with ROSC; odds ratio 1.42[95% CI 0.65 – 3.02], p=0.44.

Conclusions: These data demonstrate that SGAs are the most common advanced airway device used during in-hospital cardiac arrest management. Their ease of use, availability and increased use may explain this trend.
Most patients achieving ROSC after in-hospital cardiac arrest do not have tracheal intubation during resuscitation. Further investigation is needed.

References

TITLE: FEASIBILITY OF USING A DEFIBRILLATOR TO PROVIDE REAL-TIME AND POST-EVENT FEEDBACK TO PARAMEDICS ON THE QUALITY OF THEIR CPR

Author/s: K Smith, K Dyson, D Stub, N Magnuson, Anastasopoulos K, S Bernard

Ambulance Victoria

Background: Ambulance Victoria aimed to improve paramedic CPR performance by introducing audio-visual CPR feedback via a defibrillator with accelerometer-based technology and detailed debriefs post event.

Methods: We conducted an evaluation assessing the feasibility of using a defibrillator to provide real-time and post-event feedback to paramedics on the quality of their CPR. The pilot was conducted over a 6-month period between the 17th June 2017 and 17th December 2017.

Results: Ambulances participating in the trial arrived first at 234 OHCA. Of these cases, teams voluntarily used the CPR Feedback Pads for 85 (36%) OHCA, however case data was only available for 70 cases. The majority (77%) of paramedics who used the CPR Feedback device found it easy to apply with the defibrillator pads, with little to no disruption to standard CPR performance. The recommended chest compression depth (>5cm, 51%) and rate (100-120 compressions per minute, 51%) were achieved for half of cases. The median chest compression fraction (84%) was above the recommended standard of >80%. Overall, only 26% of paramedics who received real-time feedback were able to achieve all three CPR Quality Standards. When compared to perceived performance, this statistic differed significantly as majority (70%) of paramedics believed their CPR was already of good quality. Most paramedics reported that they found the post-event feedback helpful (74%).

Conclusion: Although utilization rates were low for the CPR Feedback device, the mismatch between perceived and actual performance highlights the need for such feedback.
TITLE: How does PCI-capability of receiving-hospital impact on survival From Out-of-hospital Cardiac Arrest? A New Zealand observational study

AUTHOR/S: G Howiea,b, B Dickerb,a, V F Toddh,a, B Tunnagea,b, A Swaina, T Smithb

aParamedicine, School of Clinical Sciences, Auckland University of Technology (AUT), Auckland, New Zealand; bSt John Ambulance, Auckland, New Zealand

Background: To compare patient characteristics and outcomes following an out-of-hospital cardiac arrest (OHCA) between those transported to hospitals with, versus without, percutaneous coronary intervention (PCI) capability.

Method: A retrospective observational study of adult patients treated for OHCA of presumed cardiac aetiology, utilising St John New Zealand OHCA registry data, 1 October 2013 to 31 October 2018. Chi-Squared analysis was used to compare population characteristics. Binary logistic regression modelling was used to investigate outcome differences in survival at thirty-days post-event, according to receiving-hospital PCI-capability.

Results: Following an OHCA, 1750 patients were transported to hospital with sustained return-of-spontaneous-circulation (ROSC). Thirty-day survival was higher in patients transported to hospitals with PCI-capability (Adjusted OR 1.3, 95%CI (1.01 to 1.63), p=0.04). A lower proportion of patients >65 years (49.9%) were conveyed to hospitals with PCI-capability compared to younger age groups, 15-44 years (52.1%) and 45-64 years (59.7%) (p<0.001). Pacific Peoples (86.2%) had the highest proportion of transport to hospitals with PCI-capability, followed by European (55.6%), then Māori (32.9%) (p<0.001). Patients in urban locations were more likely to be transported to hospitals with PCI-capability (59.1%) compared to patients located rurally (34.7%) (p<0.001). Median ambulance transport time from scene of OHCA to PCI-capable hospitals (13 minutes) was longer compared to non-PCI-capable hospitals (10 minutes) (p<0.001).

Conclusion: Odds of survival were significantly increased in patients conveyed to hospitals with PCI-capability compared to those who were not. Inequities in healthcare may exist related to age, ethnicity and rurality, associated with receiving-hospital PCI-capability. These warrant further investigation.

TITLE: ORGAN AND TISSUE DONATION AFTER RESUSCITATION FROM CARDIAC ARREST

AUTHOR/S: D Joughin; V Palmer; M Parr

Intensive Care Unit, Liverpool Hospital, Sydney, NSW

Introduction: Organ and tissue donation (OTD) increases both quality of life and life expectancy. OTD after cardiac arrest (CA) has been uncommon, but post-resuscitation care of patients following cardiac arrest has changed over the last decade, and consideration for OTD may have also changed.

Methods: We performed a retrospective, observational study reviewing OTD after CA at Liverpool Hospital between January 2016 and February 2019.

Results: Over the 3 years, 210 patients were referred for consideration of OTD. During this period there were 132 post CA deaths with 60 (45.5%) referred for OTD consideration accounting for 28.6% of all referrals. In total, 32 patients became actual or intended donors, of which 12 (37.5%) were post CA (3 in and 9 out-of-hospital). Of the post CA donors, 6 (50%) were donations after brain death, 1 (8.3%) was a donation after circulatory death, 3 (25%) were tissue donors, and 2 (16.7%) were intended donors that did not progress to completion. Organs donated included: 1 set of heart valves, 2 lungs, 5 livers, 6 kidneys, 4 eyes, 2 skin donors and 1 bone donor.

Conclusions: Referrals for OTD from post CA patients accounted for 28.6% of referrals and 37.5% of all donations. Donation was achieved in both in and out-of-hospital CA victims, which indicates that OTD is viable in CA patients. Increased consideration and notification practice may improve OTD rates from victims who ultimately do not survive cardiac arrest.
Communities are striving to increase bystander cardiopulmonary resuscitation (CPR) and retrieval of Automatic External Defibrillators to improve out-of-hospital cardiac arrest (OHCA) outcomes. Ambulance Victoria have adopted the GoodSAM mobile-phone app to alert registered community responders to cases of suspected OHCA in their vicinity.

**Methods:** We performed an interim evaluation of the implementation of GoodSAM at Ambulance Victoria from 28-Jan-2018 to 31-Jul-2018. GoodSAM eligible cases included suspected OHCAs, apnoeic seizures and drownings according to dispatch event types.

**Results:** By the end of the evaluation period, there were 1,926 registered responders. There were 3,609 eligible events and 544 (15%) where at least one responder was notified. Of these, 283 (52%) did not respond, 133 (24%) rejected the alert and 128 (24%) accepted the alert. GoodSAM responders attended 41 events including 23 confirmed cardiac arrests. For OHCA events where GoodSAM responders did arrive first, they arrived a median of 1.7 minutes faster than emergency medical services (EMS). GoodSAM responders reported giving CPR to 7 (30%) patients and defibrillating 1 (4%) patient. Unadjusted survival was higher for GoodSAM eligible resuscitation attempted OHCAs where responders attended (41% versus 11%).

**Conclusion:** GoodSAM was effectively integrated with the EMS response model for OHCA, however, only a small number of responders accepted an alert and arrived on scene. Increasing the number and geographical coverage of registered responders and identifying the reasons why responders did not accept an alert are important factors in establishing the overall success of GoodSAM.
SESSION 3 – MEETING ROOM C3.6 - 1400 - 1530

TITLE: IMPROVING RESUSCITATION RATES AFTER OUT-OF-HOSPITAL CARDIAC ARREST - AN IMPLEMENTATION STUDY

AUTHOR/S: S. K MacIntyre S Bettiol A Kitsos T Kariotis N Gibson P MacIntyre
School of Medicine. University of Tasmania and Department of Cardiology, Royal Hobart Hospital

Introduction: Early cardio-pulmonary resuscitation (CPR) and defibrillation are crucial to improving outcomes following out-of-hospital-cardiac-arrest (OHCA) and compression-only CPR has been advocated as an alternative to standard CPR. This study aimed to develop an Australian CPR video with a celebrity actor and use this in a national campaign to raise awareness of resuscitation through digital media.

Methods: The 8-week digital media campaign was launched February 2018 with the release of ‘Shock Verdict’, an educational video based on the Australian comedy-drama “Rake”. Developed in partnership with the Tasmanian Branch of the Australian Resuscitation Council, the University of Tasmania and Royal Hobart Hospital, the campaign focusses on how untrained bystanders can perform compression-only CPR and use an Automated External Defibrillator. An online survey was carried out to examine knowledge and attitudes related to CPR.

Results: There were over 1,392,208 video views: 1,140,023 views via Facebook, 251,185 views via Youtube. 72% of Facebook views were in women and 60% in people aged ≥45 years. Of Youtube views, 27% were in women and 24.5% in people aged ≥45 years. Baseline survey data from 140 participants found that 50% of respondents rated their knowledge and confidence to perform CPR as good or fair. Participants were more likely to report willingness to start hands-only CPR on strangers and unkempt individuals than standard CPR.

Conclusion: This study supports the use of digital marketing to deliver CPR education and raise awareness. It highlights the importance of collaboration between academics, policy makers and practitioners in improving outcomes from OHCA.

TITLE: INCREASING THE UPTAKE OF CARDIOPULMONARY RESUSCITATION TRAINING WITHIN AUSTRALIAN CARDIAC REHABILITATION PROGRAMS: A NATIONAL IMPLEMENTATION STUDY

AUTHOR/S: S Cartledge, J Bray, B Abell, D Stub, J Finn, L Neubeck
Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria

Background: People attending Cardiac Rehabilitation (CRehab) are at increased risk of cardiac arrest. We have demonstrated that people attending CR would like to be taught cardiopulmonary resuscitation (CPR) yet provision of CPR training in Australian CRehab programs is 24%.

Aim: This study aimed to identify the best strategy to implement CPR training into CR programs.

Methods: A two-arm randomised controlled implementation study is being conducted across Australia. One CRehab coordinator per program are eligible to participate. Coordinators are randomised 1:1 and receive an information pack (control & intervention) and a face-to-face education session (intervention).

Results: To date 36 programs (61% metropolitan, 39% rural) have been randomised. Few programs had (14%) offered past CPR training and only 17% currently include CPR information. Baseline data identified common barriers to incorporating CPR training included time (69%), resources (69%) and a lack of awareness (19%). Coordinators are motivated to include CPR training as they believe that participants are interested in learning CPR (78%). Of the 12 programs to complete the study to date, 70% have incorporated CPR training into their programs (80% intervention, 60% control). Time was the most common barrier (67%) to implementation. Brief qualitative interviews with coordinators revealed that staffing, the responsibility of conducting CPR training and a reluctance to change were additional barriers.
Conclusions: CR represents a logical location to provide targeted CPR training to high-risk cardiac groups at scale nationally. This study will aid understanding of how CR coordinators can be supported to enable more programs to incorporate CPR training.

TITLE: RESULTS FROM THE HEART FOUNDATION’S HEART WATCH SURVEY: AUSTRALIAN’S AWARENESS OF CARDIAC ARREST AND RATES OF CPR TRAINING.

AUTHOR/S: S Cartledge, D Saxton, J Finn, J Bray
Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria

Introduction: There is growing evidence of a link between rates of community CPR training and rates of bystander CPR. We aimed to obtain contemporary data on the Australian public’s CPR knowledge and training.

Methods: An online survey was conducted with adults throughout Australia in July 2017 as part of the HeartWatch survey conducted by the Heart Foundation of Australia.

Results: 1,076 adults (51% female, 76% Australian-born, 90% completed at least 12 years of education) responded. Most had heard of CPR (90%) and a defibrillator (80%). One third stated they knew the difference between a cardiac arrest and a heart attack. However, only 16% of these described the conditions correctly and less than 3% described a person in cardiac arrest as unresponsive and not breathing.

Over half (56%) were trained in CPR, but only 22% trained in the last year (42% trained >5 years previously). Having CPR training was associated with greater confidence in ability to perform effective CPR (45% vs. 6%, p<0.001) and willingness to provide CPR to a stranger (70% vs. 34%, p<0.001). The majority who were untrained had never thought of it (46%) or didn’t know where to learn (22%), but most (76%) of those untrained were willing to learn. Training preference was for group learning led by a professional (76%) with 18% preferring self-learning.

Conclusion: This is the first Australian-wide data on CPR awareness and rates of training. There is a need to improve Australian’s understanding of cardiac arrest and to increase rates of CPR training.

TITLE: CARDIOPULMONARY RESUSCITATION (CPR) SKILLS, KNOWLEDGE, TRAINING, SELF-EFFICACY AND WILLINGNESS OF LAYPEOPLE: PRELIMINARY RESULTS FROM THE TOWNSVILLE CPR STUDY

AUTHOR/S: Matthew Riggs,1 Richard Franklin,2
1. College of Medicine and Dentistry, James Cook University. 2. College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, Qld

Aim: To describe the associations between laypeople cardiopulmonary resuscitation (CPR) skills against knowledge, training, self-efficacy and willingness.

Methods: A survey and practical CPR assessment of community members at public locations in Townsville, Queensland, using a convenience sampling approach. Participants completed a survey about demographics, training history, self-efficacy and willingness to perform CPR, then were assessed by both a human assessor and digital mannequin while performing CPR for 2 minutes.

Results: Of the 343 people who performed CPR, 271 were laypeople (i.e. not health professionals). Among laypeople, age and socioeconomic status were not associated with CPR skills. Males performed more effective ventilations than females, however there was no difference in compression skills. Weekly exercise duration was not associated with CPR skills. People who speak English as a first language or were born in Australia perform higher quality CPR than culturally and linguistically diverse groups. Ever having had formal CPR training, the number of times formally trained, and a smaller duration since CPR training were associated with improved CPR performance.
Designated lifeguards or volunteer first-aiders had better CPR skills, particularly ventilation skills, than non-lifeguards. Total knowledge score was positively associated with CPR ability. Self-efficacy was significantly associated with CPR skills. Willingness to perform CPR did not consistently improve any given skill.

**Conclusions:** Training, knowledge and self-efficacy were factors most consistently associated with CPR skills of laypeople in Townsville. Encouraging frequent and regular formal CPR training should improve skills. Self-efficacy could be used to identify individuals who would maximally benefit from further training.

**Acknowledgements:**
This study was supported by the Laerdal Foundation Project Support Grant and the James Cook University.

**TITLE:** CARDIOPULMONARY RESUSCITATION (CPR) SKILLS OVER TIME AND HUMAN VERSUS MANNEQUIN ASSESSMENT: PRELIMINARY RESULTS FROM THE TOWNSVILLE CPR STUDY

**AUTHOR/S:** Matthew Riggs,1 Richard Franklin,2
1. College of Medicine and Dentistry, James Cook University. 2. College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, Qld

**Aim:** To describe the impact of time from training on skills and the differences between human and mannequin assessment.

**Methods:** A community survey exploring CPR skills on a Laerdal Resusci Anne QCPR™ skills mannequin was undertaken in Townsville, Queensland, using a convenience sample. Participants were assessed using the mannequin and human assessor for: compression depth/rate, hand placement, chest recoil, ventilation, interruptions to CPR and compression-to-ventilation ratio. The participant performed CPR for 2 minutes.

**Preliminary Results:** There were 269 people who undertook the skills assessment, average time since last trained was 1,542 days (3.82 years). There was no difference in time since trained by gender or level of education, however time since trained increased as a person aged (P<0.001) and was shorter for people without children (889 vs 2061 days). Overall 62% were assessed as competent with those with the most recent training (<6months) having the highest proportion. The decline in skills using the overall mannequin score showed a decline at the 3-year mark. There was a correlation between with the human and mannequin assessment overall, however this varied by individual skills, e.g. for compression rates there were 210 people that the human assessor said were competent and only 102 for the mannequin, with 72 (34%) where both the human and mannequin agreed. The lowest correlation was for chest recoil and ventilation and highest was for depth and minimising interruptions.

**Conclusions:** Time since training impacts on skills. While correlated there are differences in assessment between a human and a skills meter.

**Acknowledgements:**
This study was supported by the Laerdal Foundation Project Support Grant and the James Cook University.
TITLE: OUT-OF-HOSPITAL CARDIAC ARREST OUTCOMES ACCORDING TO THE LEVEL OF TRAINING AND THE RELATIONSHIP TO THE PATIENT OF THE PERSON PROVIDING BYSTANDER CPR


NHMRC Centre of Research Excellence in Pre-hospital Emergency Care Australia and New Zealand (PEC-ANZ), Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria

Background: Bystander CPR (byCPR) has been associated with improved outcomes in Out-of-hospital Cardiac Arrest (OHCA). In this study, we describe the relationship to the patient of the person providing byCPR, their level of training and the influence these had on patient outcomes.

Method: Non-traumatic OHCA who received byCPR and Emergency Medical Services resuscitation from 1/1/2015 - 31/12/2017 were included from the Victorian Ambulance Cardiac Arrest Registry. Ambulance Victoria patient care reports were analysed to ascertain the relationship to the patient of the person providing byCPR and their level of medical qualification. We performed multivariable logistic regression to assess the association between survival to hospital discharge and 1) Related-byCPR (family, friends and colleagues), and 2) Med-byCPR (healthcare professional providing by-CPR).

Results: We found that 2385 (53.4%) OHCA patients received byCPR from a relative, 468 (10.5%) from a friend or colleague and 1611 (36.1%) from a bystander unrelated to the patient. Of those providing byCPR 3703 (83%) were laypersons and 761 (17%) were healthcare professionals. Using multivariable regression analysis, adjusted for known Utstein factors, we found Med-byCPR was associated with increased odds of survival to hospital discharge (14.5% vs 13.8%, OR:1.4 [95% CI: 1.02 – 1.92]) compared to those who received Lay-byCPR. We found no association between the relationship to the patient and survival to hospital discharge.

Conclusion: Bystander CPR from a healthcare professional was associated with increased survival. This is an important finding and has implications when planning the dispatch of community responders to cardiac arrest patients.
PLENARY ABSTRACTS CONT’D

TITLE: CERVICAL COLLARS AND TOURNIQUETS - ARE THEY IN OR OUT?
AUTHOR: Jason Bendall
St John Ambulance Australia | University of Newcastle, NSW

ILCOR 2015 made game changing recommendations regarding the first aid management for major bleeding and spinal injuries. The treatment recommendation for bleeding saw the return of tourniquets for the control of life-threatening limb bleeding. Whilst there is no doubt tourniquets can save lives, a tourniquet is not needed to control most bleeding encountered in the first aid setting and therefore the benefits of tourniquets does not always outweigh the potential harms. The role for tourniquets in the immediate treatment and triage of mass casualty situations is becoming well established in an environment of elevated threats.

ILCOR 2015 suggested against the routine use of cervical collars by first aid providers however this was a weak recommendation based on very low quality evidence. The benefits versus risks / harms of cervical collars remains controversial. No doubt due to the consequences of a spinal cord injury there remains considerable concern about the potential to worsen or cause cord injury if a cervical collar is not applied. Conversely some argue that the mere application of a cervical collar in itself potentially cause or worsen a spinal injury. The principles of spinal injury care remain the same (with or without collars) – first do no harm, ensure the neck is in a neutral position and limit angular movement of the neck. It is also important to recognise that most people with suspected spinal injuries do not actually have a clinically important bony or neurological injury.

There remain important gaps in the science of bleeding control and the first aid management of suspected spinal injuries and this presentation will provide an update on both the science and practice of bleeding control and the management of spinal injuries. The simple answer to the question IN or OUT is “it depends”.

TITLE: BREATHS AND CPR
AUTHOR: Julie Considine
Deakin University – Eastern Health, Melbourne, Victoria

Currently there are two forms of cardiopulmonary resuscitation (CPR): CPR consisting of chest compressions and assisted ventilation (rescue breathing) and chest compression-only CPR. Supporters of chest compression-only CPR report that it is easier to teach, remember, and perform when compared with chest compressions and assisted ventilation so is therefore an effective strategy to increase bystander CPR. The opposing perspective is that chest compressions without assisted ventilation are less effective because of inadequate oxygenation and increasing respiratory acidosis. Concerns about compression only CPR are particularly important in patients whose cardiac arrest is from a presumed asphyxial cause or in the context of prolonged CPR. In this presentation, the current state of the evidence regarding compression only versus CPR with chest compressions and assisted ventilation will be presented and an overview of the specific patient groups in whom assisted ventilation is important will be highlighted.

TITLE: AN UPDATE ON PCI
AUTHOR: Dion Stub
A/Prof Stub will highlight updates in the landscape on interventional cardiology, with a focus on recent landmark trials in the role of coronary angiography after cardiac arrest and percutaneous techniques for myocardial infarction and valve replacement.
TITLE: POST RESUSCITATION CARE (INCL TTM)

AUTHOR: Jerry Nolan
Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath UK

After return of spontaneous circulation (ROSC) many patients will develop the post-resuscitation syndrome (PCAS) and the chances of surviving and making a good neurological recovery will be influenced significantly by the quality of the management of the PCAS. Patients with ST elevation on their ECG will benefit from urgent coronary catheterisation.

Comatose survivors of cardiac arrest should be treated with targeted temperature management (TTM); however, the optimal target temperature, duration and method remains uncertain. The ongoing TTM-2 trial aims to determine if there is any benefit for TTM at 33°C versus fever control only.

There is conflicting evidence for potential harm from hyperoxia and some recent evidence indicates that mild hypercarbia may be protective. The EXACT and TAME trials are evaluating titrated oxygen therapy and mild hypercapnia respectively.

There is evidence that some post cardiac arrest patients have impaired cerebral autoregulation and such patients may benefit from a higher mean arterial pressure. The optimal blood pressure is uncertain but is the subject of ongoing research.

About a third of comatose post-cardiac patients who eventually awaken do so more than 48 h after stopping sedation (late awakeners) and there is evidence that withdrawal of life sustaining treatment (WLST) decisions are frequently made prematurely. Multimodal prognostication is now advocated in an attempt to prevent premature WLST.

TITLE: CPR AND ORGAN DONATION

AUTHOR: Michael Parr
Liverpool Hospital ICU, Sydney NSW

Each organ and tissue donor can transform the lives of several patients and Australia is a world leader for successful transplantation. While the donation rate has more than doubled in recent years, the demand for organs remains high. There are insufficient donors to meet demands in many countries. In Europe and estimated 12 patients die each day while waiting for an organ transplant. Around 1,400 Australians are currently waitlisted for a transplant, and an additional 11,000 are on dialysis and would benefit from a kidney transplant.

In Australia in 2018, 1,782 recipients received organs from 554 deceased and 238 living organ donors. Donation from living donors is not possible for heart, lung, pancreas and small bowel. Most donors worldwide are brain dead donors after neurological determination of death but donation after circulatory determination of death (DCD) has become increasingly common in recent years. DCD can be controlled or uncontrolled.

In controlled DCD, cardiac arrest (CA) occurs after withdrawal of life-sustaining treatments in patients where further treatment is deemed as futile. In uncontrolled DCD, cardiac arrest occurs unexpectedly, either in-hospital or out-of-hospital. Traditionally the organs from patient who die from sudden cardiac arrest (both controlled and uncontrolled) have been considered unsuitable because of organ injury but in recent years this perception has changed and more donations are occurring from this group.
TITLE: PATIENT AND PUBLIC INVOLVEMENT IN RESEARCH

AUTHOR: Gavin Perkins

The research landscape is changing. Traditional models of clinical research considered patients as the subject of research trials who would be assigned to one or more interventions. Information from research would be used to inform treatment decisions about patients.

Research that reflects the needs and views of the public is more likely to produce results that can be used to improve health and social care. Contemporary approaches by contrast prioritise patient involvement as a way to improve identifying which research questions are most important, enhancing the design and conduct of the trial to enhance acceptability and sharing decisions about how the findings from the research are used to inform practice.

INVOLVE, an organisation which supports active public involvement in research, defines public involvement in research as research being carried out ‘with’ or ‘by’ members of the public rather than ‘to’, ‘about’ or ‘for’ them.

The PARAMEDIC2 trial, a randomised, placebo controlled trial of adrenaline in out of hospital cardiac arrest, worked with patient and public partners to help design, deliver and disseminate the research findings. Involvement was achieved through patient and public membership of the research team and as a co-applicant on the application for funding; consultation to develop and prioritise the research question; patient and public user group development of key patient focused materials; interpretation and dissemination of the research findings.

Further information: INVOLVE, https://www.invo.org.uk/

TITLE: IS IT SAFE?

AUTHOR/S: D Brewster-O’Brien, R Hackett, Whitaker DK, Barach P

Patient Safety Network, Sydney, Australia

The Australian Standardisation of the Hospital Emergency Number (ASHEN) initiative has achieved great progress and is building momentum to achieve international change. This project was created to save lives and decrease morbidity from unnecessary delays by creating a forcing function that helps staff struggling to recall what their Hospital Emergency Number is during a time critical emergency. Early defibrillation and effective cardiopulmonary resuscitation are essential for survival from cardiac arrest. After 2-3 minutes, success at resuscitation will have decreased by almost 50%. Time to the arrival of a cardiac arrest team has been found to be inversely related to the survival of an in-hospital cardiac arrest and likelihood of hospital discharge.

In 2006 the NHS created a standardised ‘crash call’ number, being 2222, for acute trusts in the UK. A post-implementation survey in the UK showed a 96% correct recall rate of the nationally standardised 2222 HEN, and this in contrast to a Danish survey which showed a 38% correct recall rate where the HEN was not yet standardised.

The ASHEN project has gained significant momentum across Australia, with all public hospitals in NSW, the ACT, and Ramsay Health Care agreeing to standardise to 2222 in the near future.

This is an example of ‘bottom-up’ safety change to help providers do their jobs well! The standardisation will ensure that trained healthcare workers could perform effectively at any health facility in the world.
TITLE: PAD – WHO, WHERE, WHEN, HOW?
AUTHOR: Janet Bray
Public Access Defibrillation (PAD) aims to reduce the time to defibrillation. This talk will summarise some of the novel programs aiming to increase PAD use.

TITLE: WHAT’S THE PROGNOSIS DR?
AUTHOR: Jerry Nolan
Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath UK

Of all the initially comatose survivors of cardiac arrest, about one third will take longer than 48 hours to awaken after sedation has been stopped. There are several reports of survivors taking 10 or more days to awaken. This is probably caused by a combination of prolonged effects of sedation and the slow recovery from global hypoxic-ischaemic brain injury. With this knowledge, we are now sure that many withdrawal of life sustaining treatment (WLST) decisions made on the basis of perceived irreversible brain injury are undertaken prematurely.

The ability to reliably predict either a good or a poor outcome for a comatose survivor of cardiac arrest would facilitate communication with families and enable appropriate decisions about ongoing organ support. In the last few years there has been a vast amount of new data on prognostication but it is all observational and is prone to self-fulfilling prophecy, i.e., a WLST decision is made on the basis of one or more of the tests being investigated. The only way we could ever be certain of the reliability of a prognostic test would be to continue treatment of the patient regardless of the test results. This approach would be theoretically possible in some cultures but has yet to be achieved.

In the meantime, international guidelines recommend a multimodal approach to prognostication: clinical examination, imaging (CT and MRI), electrophysiological tests (EEG and somatosensory evoked potentials (SSEPs) and biomarkers (e.g. neuron specific enolase (NSE)). Furthermore, any consideration of WLST decisions on the basis of a poor prognosis are undertaken only after 72 hours after any sedation has cleared. In practice, such decisions are now often delayed for at least a week.

TITLE: GUIDELINES- WHAT DID WE UPDATE?
AUTHOR: Kevin Nation
New Zealand

Since 2015 the International Liaison Committee on Resuscitation (ILCOR) has transitioned from a 5-year cycle of resuscitation science evidence review to a near continuous evidence evaluation process. This ensures the timely delivery and dissemination of the highest-quality resuscitation science evidence and evaluation, and consensus on treatment recommendations. The relevant ILCOR Task Forces work with expert systematic reviewers to produce a final Consensus on Science and Treatment Recommendation (CoSTR).

The Australian and New Zealand Committee on Resuscitation (ANZCOR) reviews the newly published CoSTRs to ensure that resuscitation guidelines for Australia and New Zealand remain current and consistent with the latest evidence.

This presentation will outline recent updates to the guidelines and highlight how, before making changes, ANZCOR must balance new content from the CoSTR with the intended and unintended consequence of change and the potential training burden.
**TITLE: NEONATAL RESUSCITATION: SURFACTANT AND ECG**

**AUTHOR:** Prof Colm O’Donnell  
**National Maternity Hospital; University College Dublin; National Children’s Research Centre, Dublin, Ireland**

Heart rate (HR) is the most important indicator of a baby’s condition at birth and is used to determine their need for and response to resuscitation. Traditionally the HR has been assessed clinically. In more recent years it has been assessed with pulse oximetry (PO). Though ECG has been reported to measure the newborn’s HR more quickly than PO in the delivery room, it is not yet widely used. We are studying the utility of HR measurement with ECG in the delivery room in term and preterm infants.

**TITLE: PAEDIATRIC RAPID RESPONSE TEAMS: WHEN NEEDS ARE “MET”**

**AUTHOR:** Jason Acworth  
**Emergency Department, Queensland Children’s Hospital, Brisbane**

The Medical Emergency Team (MET) model was first developed in Sydney in the early 1990s and has since been widely implemented around the world. The concept describes a hospital-wide patient-focused system that aims to improve recognition of acute deterioration in patients and trigger a rapid response from a designated team (with critical care skills) who enact management aimed at preventing potentially avoidable adverse events (including cardiac arrest and death).

The system is different to the previous standard “code” or “arrest” team model in that it aims to assess a greater number of patients at an earlier stage of clinical deterioration rather than patients who have already suffered a respiratory or cardiac arrest. The model is particularly suited to paediatric patients because cardiac arrest in this population is more often preceded by a more prolonged period of potentially reversible deterioration.

This session will summarise the history of paediatric rapid response systems (RRS); describe how deteriorating paediatric patients differ to adult populations; demonstrate the value of implementing a MET response in a paediatric setting and outline the ideal components of a modern paediatric RRS.

**TITLE: WHAT HAPPENED TO TTM?**

**AUTHOR:** Janet Bray  

The delivery of target temperature management (TTM) is recommended in all international guidelines. However, a marked change in clinical practice has occurred in some regions following the publication of the TTM trial in 2013. This talk will summarise this emerging issue.
Background: Out-of-hospital cardiac arrest (OHCA) remains a significant public health issue in Victoria. Across the nation every year, as many as 30,000 OHCAs occur. Typically, less than 10% of OHCA patients survive. However, when cardiopulmonary resuscitation (CPR) and defibrillation are provided quickly, alongside an effective system of care, the chances of an OHCA patient being resuscitated and having a good neurological recovery greatly increases. In order to improve systems of care and patient outcomes, it is essential to monitor performance, identify problems and successes and track progress. In this paper we aim to describe how Ambulance Victoria (AV) has improved outcomes using data from VACAR.

Results: In 2017/2018 AV attended 6,434 OHCA events of which 98% were adults and 73% were presumed to be of cardiac cause. Bystander CPR has increased in past decade from 26% to 37%. The rate of event survival for patients receiving bystander CPR (29%) was higher than for patients not receiving bystander CPR (17%). Survival rates were significantly higher if a public AED was used; 64% were discharged from hospital alive compared to 26% of patients first shocked by paramedics. The rate of survival to hospital discharge for bystander witnessed patients presenting in a shockable rhythm (Utstein subgroup) was 37%. 71% individuals returned to work after their cardiac arrest and of those 84% returned to work in the same role.

Conclusion: VACAR data shows that improved cardiac arrest survival outcomes can be achieved by a systems-based focus on ongoing monitoring of OHCA survival.

TITLE: IMPROVING BYSTANDER PARTICIPATION
AUTHOR/S: Andy Lockey, Kevin Nation
United Kingdom, New Zealand

Bystander cardiopulmonary resuscitation (CPR) including the use of an automated external defibrillator (AED) is associated with a greater likelihood of survival following out of hospital cardiac arrest. Both form integral components of the chain of survival and an important goal of national public health strategy should be to increase the frequency and quality of bystander CPR.

In February 2018 the cast of the local hit TV show Rake joined a campaign to promote CPR, with a short film that aims to show Australians how to help someone who is having a sudden cardiac arrest. This is an initiative of the Australian Resuscitation Council, Tasmania Branch and is part of a National Health Campaign. The campaign intends to save lives by empowering untrained members of the community to perform bystander CPR, locate an AED and use it. Promotional activities (mass training events, media campaigns) are one of a number of strategies that may improve a bystander’s motivation and capability to respond. CPR training opportunities that occur throughout an individual’s life (at school, mandatory workplace first aid) are a more traditional approach and in January of 2019 it was announced that CPR and first aid training are to be included as part of the school curriculum in England. More locally, the New Zealand Resuscitation Council have partnered with the New Zealand Ministry of Education to develop AEDs in schools, a guidance document for local school boards.

The speakers will share their experience of these and other regional initiatives and the session will include a personal story of success.
For decades basic animal research guided the development and evolution of cardiopulmonary resuscitation. What happens when you push harder on the chest? How fast should we push? What are the hemodynamic effects of ventilation during cardiac arrest? Can we successfully resuscitate more animals if we use drugs? But as an increasing number of drugs and devices have failed to make a successful transition from bench to bedside, we have all but lost faith in the usefulness of animal experiments. But could the pendulum be shifting? We understand that animals and not humans, and that laboratory results cannot be directly extrapolated to guide clinical practice. But are we not increasingly recognizing that one human is not necessarily the same as another human, and that results from large randomized controlled trials may not always apply to individual patients? Moving away from “one size fits all” strategies and towards individualized medicine, we will surely need an increased understanding of the pathophysiologic mechanisms behind disease? What can we learn from the lab?
TITLE: CPR AND THE APPS
AUTHOR: Federico Semeraro
Department of Anaesthesia, Intensive Care and Emergency Medical Services, Ospedale Maggiore, Bologna, Italy

The smartphone is a new technology that combines mobile communication and computation in a handheld-sized device, facilitating mobile computing at the point of care. Medical applications make smartphones useful tools in the practice of evidence-based medicine at the point of care, in addition to their use in mobile clinical communication. Also, smartphones can play a very important role in patient education, disease self-management, and remote monitoring of patients.

The pervasive use of mobile phones has motivated several initiatives to integrate them into the chain-of-survival for cardiac arrest. The aim of presentation will be a systematic analysis of app available for several purpose.

TITLE: LESSONS FROM THE PAST
AUTHOR: Jerry Nolan
Department of Anaesthesia and Intensive Care Medicine, Royal United Hospital, Bath UK

The evolution of cardiopulmonary resuscitation (CPR) may be considered in three domains: artificial ventilation, artificial circulation, and defibrillation. The development of the emergency medical services enabled all three of these to be delivered sufficiently rapidly to save lives after the onset of cardiopulmonary arrest. The original of each of these domains of CPR go back much further in history than is generally realised and although ‘modern CPR’ is usually attributed to Kouwenhoven, Jude and Knickerbocker in 1960, there is good evidence that these techniques had been applied long before then… it is just that they were not well communicated and therefore failed to be disseminated.

The early life-saving societies focussed on the resuscitation of drowned victims since this was one of the commonest causes of cardiac arrest in the 18th Century. There are several good descriptions of closed chest cardiac massage dating from the 19th Century and even rudimentary attempts at defibrillation had been described well before the classic report of the first internal defibrillation by Claude Beck in 1947. There is even evidence that the Utstein template is rather older than we think.

We can all learn from the past…

TITLE: THE NEXT BIG THING FOR LITTLE THINGS
AUTHOR: Susan Niermeyer

You are the only medical provider in a remote health post. The ambulance service is on the way with a woman experiencing vaginal bleeding and back pain. She thinks she may be pregnant, but has received no prenatal care.

You spring into action to assess her not only by physical exam, but also with biomarkers for gestational age determination and risk of preterm delivery. In fact, she delivers precipitously and the baby is not breathing despite drying and stimulation. You quickly clamp a pair of dry electrodes on the chest and within 5 second determine that the heart rate is less than 60. You have participated in simulation practices with the new upright ventilation bag and the simplified respiratory function monitor, so you confidently begin positive-pressure ventilation. You immediately achieve a good seal and excellent chest wall movement. The heart rate rises rapidly and the baby begins to cry. You cut the cord and apply a binodal wireless epidermal monitoring system to the chest and foot, which gives you temperature, blood pressure, heart rate, respiratory rate and oxygen saturation. The mother continues skin-to-skin care. Despite appearing small and 36 weeks gestation, the baby soon is breathing quietly and regularly and latches at the breast.
TITLE: WHAT NEXT FOR CARDIAC ARREST RESEARCH?
AUTHOR: Gavin Perkins

Survival rates from cardiac arrest remain dismal. In most settings, less than one in ten people survive to go home from hospital after out of hospital cardiac arrest. There is a need for a refreshed approach to cardiac arrest management. A richer understanding of the pathophysiology of cardiac arrest at an individual patient level, will enable a personalised medicine approach to titrate treatments based on individual need rather than a one treatment fits all approach.

New approaches should make use of novel technologies to enhance evidence based interventions focused around the chain of survival. When initial treatments are unsuccessful, there is a need for clinically and cost effective new therapies to achieve return of spontaneous circulation.

The devastating burden of hypoxic-ischaemic brain injury after cardiac highlights the need for new approaches to rescuing the brain after cardiac arrest. This may need to begin at the start of the resuscitation attempt through to return of spontaneous circulation and in to the post resuscitation care phase. For those left with residual impairments after cardiac arrest, there is a need to develop evidence rehabilitation programmes which will allow the patient to return to enjoy an improved health related quality of life.

TITLE: RESTART A HEART DAY-2019
AUTHOR: F Semeraro, A Lockey, K Nation

Italy, United Kingdom, New Zealand

The inaugural World Restart a Heart day was run on 16 October 2018.
In Australia, 20,000 people were engaged in promotional activities with the personal support and a speech from Scott Morrison, the Australian Prime Minister. Events across the country were coordinated by the Council of Ambulance Authorities.

In New Zealand, activities were organized by St. John and Wellington Free Ambulance Service. Sessions were held in schools, airports, and hospitals with an estimated 2,150 people involved. The social media campaign, supported by the New Zealand and Australian Resuscitation Councils, reached 16,600 via Facebook and 15,000 via Twitter.

Worldwide, over 675,000 people were trained and #WorldRestartaHeart reached over 12.7 million people.

World Restart a Heart day for 2019 is once again scheduled for 16 October. Activity is planned in Canada, America, South America, Europe, Southern Africa, India, Sri Lanka, Saudi Arabia, Oman, Asia, and, of course, Australia and New Zealand.

Using an innovative approach, the three speakers will share their experiences of this initiative and the successes to date. They will also discuss the plans for World Restart a Heart 2019 as well as outlining opportunities for how the audience can support the call for all children to be taught CPR.

“All citizens of the world can save a life!”
POSTER PRESENTATIONS
(PARKSIDE BALLROOM – LEVEL 2)
POSTERS WILL BE DISPLAYED THROUGHOUT THE ENTIRE CONFERENCE IN THE TRADE EXHIBITION AREA
BOOTH NUMBER 2

TITLE: SOCIAL DETERMINANTS IMPACTING ON CPR TRAINING: RESEARCH EXPERIENCE FROM RIVER DROWNING ‘BLACKSPOTS’

AUTHORS: AE Peden 1,2, RC Franklin 1,2, PA Leggat 2, JH Pearn 1,2,3,4
1. Royal Life Saving Society – Australia, Broadway, NSW, 2007, Australia 2. College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, QLD, 4811, Australia 3. Faculty of Medicine, University of Queensland, Herston, QLD, 4006, Australia 4. Queensland Children’s Hospital, South Brisbane, QLD, 4101, Australia

The mission statement of every ARC member body is to increase CPR skills in the general community. Enrolment for CPR training is related to socio-economic status, societal awareness of risk and personal opportunity. We report here a study which has investigated several social determinants relating to acceptance of CPR training. The model of a recreational population which uses rivers and inland waterways for swimming, social events and watercraft leisure were the target of the research.

On-site research studies at four river drowning ‘blackspots’ in Queensland and New South Wales were undertaken. River users (18 years and over) were personally interviewed using a structured survey and were breathalysed. Core questions included recency and currency of CPR training, detailed demographic data including socio-economic status, remoteness classification of residential postcode, age, sex and country of birth.

Results were obtained from 677 volunteer respondents. Residents of major city areas (5.4 years), compared to those living more remotely (2.0 years), reported a longer mean time since last trained in CPR. People residing in areas classified as low socio-economic had a shorter time since qualification current (5.8 years) than those residing in more affluent areas (7.2 years).

CPR training uptake is a result of outreach advocacy highlighting the importance of potential bystander CPR training. Previous research has highlighted the crucial importance of targeting specific at-risk groups. This study indicates that advocacy for currency of CPR training and increased vigour for those in major metropolitan areas and among those in more affluent areas.

TITLE: ASSOCIATION OF TRAINING FACTORS AND LAYPEOPLE’S PRACTICAL CARDIOPULMONARY RESUSCITATION (CPR) SKILLS AND FUTURE RESEARCH RECOMMENDATIONS: FINDINGS FROM A SYSTEMATIC REVIEW

AUTHORS: Matthew Riggs,1 Richard Franklin,2 Lua Saylany1
1. College of Medicine and Dentistry, James Cook University. 2. College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, QLD

Aim: To determine whether various training methods and frequencies are associated with cardiopulmonary resuscitation (CPR) psychomotor skills.

Methods: Eight databases were systematically searched from January 2005 to February 2018 for articles that involved adult layperson participants and explored an association between training history, knowledge, self-efficacy or willingness and CPR psychomotor skills or survival outcomes after real CPR attempts.

Results: All studies showed that training improves psychomotor skills, compared to no training or pre-training levels. Training with a popular song prevented deterioration of compression rate skills and was the only intervention that predictably improved retention of a specific skill, compared to control (standard) training methods. The optimal retraining interval could not be determined due to the small number of studies and lack of reported statistical significance. Previous CPR training was generally associated with higher skills and survival-to-discharge rates, compared to no training. There was a lack of consistency in reporting across the studies.
**Conclusion:** All laypeople should attend a CPR training session to improve CPR skills and should retrain on a regular basis. Training sessions should utilise a combination of validated skill-specific training strategies, preferably including a popular song to enhance compression rate skill retention. Refresher training, which focuses on skills and self-confidence rather than knowledge, should be undertaken every 3-6 months, although this timeframe needs further validation. All future studies assessing CPR psychomotor skills should adhere to a standardised reporting outcome measures to ensure consistency and comparability of results.

**TITLE: CHANGING PRACTICE THROUGH AN IN SITU MOCK CODE BLUE PROGRAM IN A REGIONAL HOSPITAL**

**AUTHOR/S L Greives**
Tasmanian Health Service – North West¹, University of Tasmania, Rural Clinical School – Burnie². Burnie, Tasmania, Australia

**Objectives**
1. To identify system and design problems that may hinder deteriorating patient and resuscitation responses.
2. To implement appropriate practice change where necessary to resolve identified problems.

**Method:** An in situ mock code blue guideline was drafted to ensure consistent and safe practices in simulation were adhered to. Briefing sessions were held to inform participants of program objectives, roles of responders and facilitators, and general simulation procedures. Mock code blue simulations were scheduled at various sites throughout the hospitals. Some areas were chosen to test systems in newly designed layouts, or where there had been a recent practice change. The mock code blue was announced over the hospital public address system. The code blue team rostered at the time of the call attended the simulation. Evaluations and feedback were collated with recommendations forwarded to the hospital medical emergency response committee (MERC). Where problems were identified, subsequent practice changes were implemented.

**Results:** As a result of the program practice changes were implemented in the paediatric unit, intensive care unit, ante natal clinic, Radiology Department, Operating Theatres and North West Private Hospital (results table on poster).

**Conclusion:** An in situ mock code blue program was able to identify systems and design errors that may have impeded deterioration patient and resuscitation team efforts. By staging the mock code blue scenarios in the clinical areas, practice changes were able to be implemented pre-emptively. This process may help inform design layout in new clinical environments.

**TITLE: A Web Based App to Improve Pre-Course Learning for the Immediate Life Support Course**

On behalf of the Immediate Life Support Subcommittee, Resuscitation Council (UK), London, United Kingdom

The Immediate Life Support (ILS) Course was introduced by the Resuscitation Council (UK) (RCUK) in 2002¹ and since its establishment nearly 500,000² people have attended. This 1-day course is aimed at all health care professionals and is designed to provide the knowledge and skills to manage a deteriorating patient or cardiac arrest in the first minutes whilst awaiting the arrival of a cardiac arrest team. ILS includes a pre-course manual, face-to-face lectures, skills stations and cardiac arrest scenario simulation.

We have designed a web based app to enhance the pre-course learning materials. The app incorporates lectures previously given on the course, interactive sections on the ABCDE assessment and cardiac arrest algorithm, two new videos created by RCUK, a pre-course test, and sections on non-technical skills and shared decision making. Timing for the face-to-face element is reduced increasing the focus on the technical and team working skills.
The online learning tool is participant centered, enabling individuals with different learning needs to alter the focus of their pre-course learning accordingly.

This web based app has been introduced to limited ILS centers for testing in January 2019 and will be rolled out nationally later in the year. Content will be reviewed on a regular basis and updated as necessary.

BOOTH NUMBER 24

TITLE: CALD* COMMUNITIES ACCESS TO RESUSCITATION

AUTHOR: Elizabeth Flemming-Judge
ARC Consumer Representative

We all think we have access to high quality resuscitation in Australia. But even in Melbourne, we have groups who don’t even realize it is possible to resuscitate a collapsed person. This is a preliminary study of Culturally and Linguistically Diverse (CALD) communities understanding of and access to resuscitation. For this qualitative research, 19 participants were interviewed face-to-face. The communities were: older Greek, Sikh, Chinese (Mandarin and Cantonese) and older Muslim Women (Indian, Iranian, Ethiopian) and Italian. At least 7 respondents had university education, 5 had high school education only, 7 had been trained in CPR as a requisite for their employment, such as day care and elderly care workers.

Our findings showed that an overwhelming majority of the respondents did not understand the word resuscitation or never heard the word before, or what it entailed. However, 17 out of 19 did recognize the word CPR. They also were keen to participate in training once the possibility was explained to them, particularly the Sikh, young Muslim women and the Chinese communities. The majority never witnessed resuscitation but would call an ambulance if confronted with a collapsed person. Likewise, the majority of respondents would consent to be resuscitated and were willing to learn resuscitation.

Most said proficiency in English is a barrier to understanding resuscitation and learning about resuscitation was difficult to achieve in their countries of origin. Given this is 25% of our population; the question is how are we going to solve this inequality?

* CALD: Culturally and Linguistically Diverse (communities)

TITLE: CORE COMPETENCIES FOR PREHOSPITAL ALS EDUCATION

AUTHORS: D. Reid1 and H. Grantham2 and M. Gale2 and Shelley Beatty3
1: Edith Cowan University and St John Ambulance Australia (NT) Inc 2: Australian Resuscitation Council, 3: Edith Cowan University. Perth, Western Australia

The Australian Resuscitation Council estimates there are over 15,000 out of hospital cardiac arrests annually. Prehospital cardiac arrest is associated with extremely high morbidity and mortality, and Aus-Roc identifies variation between Australian States in relation to both event survival (21%-36%), and survival to discharge (9%-17%). The prehospital environment involves specific challenges including limited space, lighting and unpredictable bystanders when compared to cardiac arrests occurring in healthcare facilities. Prehospital providers also experience the added challenge of moving a patient on a narrow stretcher, in a moving vehicle whilst performing resuscitation procedures. A literature review of 116 articles identified that standardised ALS education focusses on the hospital environment, which assumes access to space, equipment, lighting, fixed beds, diagnostics and trained staff. An international survey, attracting 177 respondents, indicated prehospital ALS education gaps in leadership, interprofessional teamwork, working with lay responders, communication and prehospital simulation. The literature review and survey demonstrated the need for a prehospital focussed ALS course with core education components identified. A follow-up survey of 42 healthcare professionals and 29 face-to-face semi-structured interviews identified that a prehospital focussed ALS course should follow the core components of current ARC courses, with specific adjustments for the prehospital environment.
Adjustments included inclusion of prehospital scenarios, team composition, roles and responsibilities, post-ROSC care and hot debriefing. This research is important as it supports core components of prehospital ALS education as Aus-ROC continues to research prehospital resuscitation, the recent registration of paramedics and identification that approximately 25% work in the private sector, and continued incorporation of the Global Resuscitation Alliance Program 3 (Begin High-Performance EMS CPR with ongoing training and quality improvement) across Ambulance Services.

**TITLE: CALL AN AMBULANCE! AMBULANCE CALLS TO AUSTRALIAN BEACHES 2008/09 TO 2017/18**

**AUTHORS: D. Reid¹ and Shane Daw² and Chris Jacobsen²**

¹: Edith Cowan University and St John Ambulance (NT) Inc ²: Surf Life Saving Australia

Between 2008/09 and 2017/18 Surf Life Saving Australia (SLSA) volunteer lifesavers and lifeguards performed 125,057 rescues and treated 593,125 patients with injuries. Of those rescues and first aid treatments, 38,663 (5% of total incidents) were serious enough to have a detailed SLSA Incident Report Form completed and data entered onto the SLSA National Incident Report Database (IRD). This study, which is of particular interest to those working in emergency departments, paramedics and first aiders, describes the aetiology of 12,342 ambulance calls occurring on Australian beaches over a 10-year period for which an SLSA Incident Report Form was completed.

The study design was retrospective analysis and included all first aid incidents which were entered into the SLSA Incident Reporting Database. It is relevant because of the significant number of people who are being injured or get ill on the beach each year. Of the 12,342 ambulance calls, 36% were for females, 52% for patients aged 18-59 years of age with a further 37% for patients aged under 18 years. 79% of calls were for traumatic injuries, with 21% of calls for medical emergencies. 23% of ambulance calls were for neurological emergencies, 14% for fractures or dislocations and 9% for open wounds. The significant number of beach incidents attended each year by SLSA staff and volunteers has implications for their training, and resourcing requirements. The aetiology of beach incidents reflects the importance that the beach plays in many peoples’ lives in Australia, as well as the sporting and tourism roles it has in the community.

Surf Life Saving Australia Annual Reports available from sls.com.au

**TITLE: COMPARISON OF PAEDIATRIC OUT-OF-HOSPITAL CARDIAC ARREST ACCORDING TO WITNESS STATUS**

**AUTHORS: Magnuson N, Nehme Z, Bernard S, Smith K.**

Ambulance Victoria

**Background:** A proportion of paediatric out-of-hospital cardiac arrest (OHCA) are witnessed by paramedics. In this study, we aimed to examine the characteristics and survival outcomes for paediatric OHCA by witness status in Victoria, Australia.

**Methods:** A total of 1,204 paediatric OHCA cases receiving EMS attempted resuscitation between 2000 and 2017 from the Victorian Ambulance Cardiac Arrest Registry, were included and stratified by witnessed status: unwitnessed cases ± bystander CPR, bystander witnessed cases ± bystander CPR, and EMS witnessed cases. Adjusted logistic regression analysis was used to compare survival outcomes between witness groups.

**Results:** Initial shockable rhythm was most common in bystander witnessed cases (20.5%), receiving bystander CPR. In comparison, EMS witnessed cases predominantly presented with PEA (65.1%) as the initial arrest rhythm. Unadjusted survival-to-hospital discharged was highest in the bystander witnessed cases, receiving bystander CPR (16.9%) and the EMS witnessed group (15.4%).
When stratified by initial arrest rhythm, survival-to-hospital discharge was highest in bystander witnessed cases, receiving bystander CPR, given VF/VT was the initial arrest rhythm. Following multivariate analysis, odds of survival-to-hospital discharge was twice as high in the EMS witnessed group (OR 2.44, 95% CI: 1.11, 5.36) compared to bystander witnessed cases, receiving bystander CPR (reference).

**Conclusion:** Survival-to-hospital discharge for paediatric OHCA is greatest in the EMS witnessed group compared bystander witnessed cases and unwitnessed cases.

**BOOTH NUMBER 27**

**TITLE:** A COMPARISON OF VICTORIAN REGIONS AT DIFFERENT RISK LEVELS OF ACUTE MYOCARDIAL INFARCTION - HOW ARE THEY DIFFERENT?

**AUTHORS:** JE Bray, R Beauchamp, R Clark, Z Nehme, A Nguyen, S Cartledge, P Cameron, D Stub and J Finn.

*Monash University, Melbourne; Curtin University, Perth; National Heart Foundation, Melbourne; Deakin University, Melbourne; and Ambulance Victoria, Melbourne.*

**Background:** The Heart Foundation’s Heart Maps allow for the identification of Local Government Areas (LGAs) at highest-risk of acute myocardial infarction (AMI). In this study we compared the population characteristics, knowledge, and rates of out-of-hospital cardiac arrest (OHCA) and ambulance use of LGAs at highest- and lowest-risk.

**Methods:** We obtained the names of the LGAs with the highest (n=16) and lowest (n=16) age-standardised rates of AMI from the Heart Foundation Heart Maps Website. We compared data for each of these LGAs obtained from the: Australian Bureau of Statistics Census (2016); Heart Foundation Heart Maps; Heart Foundation Heart Watch Surveys; Victorian Department of Health and Human Services (DHHS) Victorian Population Health Survey (2016); and the DHHS Victorian Emergency Minimum Dataset (VEMD).

**Results:** Age and sex distributions were similar between the regions. High-risk regions were significantly more likely to have: lower population densities, different demographics (e.g. more Australian-born), and lower socio-economic status (e.g. education and income). There was no difference in rates of CPR training (65% vs 57%, p=0.14). However high-risk regions were: less likely to know the difference between a heart attack and a cardiac arrest (23% vs. 43%, p<0.001); have high rates of OHCA per 10,000 residents (8.0 vs. 6.5, p=0.03); and lower rates of ambulance use for AMI (adjusted OR=0.87, 95%CI:0.81-0.94).

**Conclusion:** Education targeting regions at highest risk of AMI may provide a logical and practical opportunity to reduce cardiovascular mortality and morbidity. Tailoring this education to knowledge deficits and underlying characteristics may assist in reaching these populations.

**TITLE:** NOT AGAIN! FALSE ALARM CODE BLUES IN A NEW AUSTRALIAN HOSPITAL

**AUTHOR/S:** Z Doherty, R Kippen, B O’Sullivan, P Faulkner, J Fletcher, K Fuzzard,

*Monash University Bendigo, Victoria*

**Introduction:** A Code Blue is used in most hospitals to notify staff of a medical emergency. It is commonly activated by pressing an emergency-alert button and results in the deployment of staff to the area. As such, strategies to prevent accidental presses should be investigated. This study evaluates the use of protective button covers for decreasing accidental presses.

**Methods:** All false-alarm Code Blues were analysed from a prospectively collected Code Blue registry at a large regional hospital before a hospital site relocation (pre January 2017), after relocation and before installation of covers (January 2017 - June 2018) and after installation of covers (July – December 2018).

**Results:** During the period from 2000 to 2018, a total of 1,289 false-alarm Code Blues occurred. At the
old hospital site, where covers had been installed, the average number of false alarms was 0.4 per week. After the relocation, and before the installation of covers, the average increased to 11.9 per week (27-fold increase). Following the cover installation, false alarms decreased to an average of 4.8 per week.

**Conclusion:** At a large regional hospital, there was a 27-fold increase in the number of false-alarm Code Blues following relocation from the old hospital site where emergency-alert buttons had covers, to the new site where covers had not been installed. False alarms reduced significantly once covers were installed on emergency-alert buttons at the new site. A mandatory requirement that all emergency-alert buttons have covers may reduce the number of false alarm Code Blues.

**TITLE:** A MACHINE LEARNING APPROACH FOR OUT-OF-HOSPITAL CARDIAC ARREST OUTCOME PREDICTION

**AUTHOR/S:** R NAIR, S NANAYAKKARA, K DYSON, K SMITH

Centre for Research and Evaluation, Ambulance Victoria; Department of Epidemiology and Preventive Medicine, Monash University; Department of Cardiology, Alfred Hospital; Baker Heart & Diabetes Institute and Department of Medicine, Nursing and Health sciences - Melbourne, Victoria, Australia

**Introduction:** Out-of-Hospital Cardiac Arrest (OHCA) is a leading cause of death around the world, however outcome prediction remains challenging. We aimed to develop a proof-of-concept machine learning model (gradient boosted machine; GBM) to predict OHCA mortality using pre-hospital variables compared to logistic regression.

**Methods:** This retrospective cohort study was based on Victorian Ambulance Cardiac Arrest Registry (VACAR) data between 2008 and 2017. Adult patients (Age >= 15 years) with cardiac aetiology where emergency personal attempted resuscitation were included in the study. The primary outcome was mortality either at scene or hospital discharge. The sample was divided into a training cohort (80%) and internally validated against a separate cohort (20%).

**Results:** A total of 18,519 patients were included. Mean age was 68 ± 16 years and 69% were male. The overall mortality was 85%. The ML algorithm demonstrated significantly greater discrimination and improved calibration compared to logistic regression; (AUC: 0.89 vs 0.76; and Brier score 0.09 vs 0.11). The precision/recall scores were (0.89 vs 0.86; 0.97 vs 0.99)

**Conclusions:** In patients with OHCA, ML modelling improves discrimination and calibration for the prediction of mortality compared with logistic regression. Further research is required to determine the role of additional features and data linkage with in-hospital data as well as long term outcomes. Explainability algorithms may also improve translation to the clinical setting.

**TITLE:** OPTIMIZING PUBLIC DEFIBRILLATOR LOCATIONS – A CASE STUDY IN ALBANY, WA

**AUTHORS:** S BALL, D BRINK, D ROSE, P BAILEY AND J FINN

CURTIN UNIVERSITY, PERTH

**Background:** Bystander use of automated external defibrillators (AEDs) is one of the most effective ways of saving lives from out-of-hospital cardiac arrest (OHCA), but depends critically on access to an AED in the minutes following an arrest. In regional Australia, there are significant challenges in ensuring that AEDs are located near likely locations of OHCA. We modelled spatial variation in the density of OHCA in the vicinity of Albany, Western Australia, to help prioritise areas for deployment of public-access AEDs.

**Methods:** We used spatial analysis methods to map the density of non-traumatic OHCA cases in the vicinity of Albany, Jan 2015 to Dec 2017. From this, we defined four zones of varying density, and developed a decision support tool in MS Excel to compare scenarios of spatial coverage of AEDs.

**Results:** Cases of OHCA were highly concentrated within parts of the Albany region. While 82 square kilometres included 90% of all cases, only 19 square kilometres were required to include 50% of all cases.
Our decision support tool demonstrated that high density deployment of AEDs (i.e. within walking-distance) is only practical for a subset of the Albany region, and that other models of delivery (e.g. vehicle-based) may be required for outlying areas.

**Conclusion:** High levels of spatial variation in the density of cardiac arrests mean that investment in public-access defibrillators needs to be carefully targeted. Even within small geographic regions, different densities and modes of AED deployment may be required to achieve coverage.

**BOOTH NUMBER 28**

**TITLE: A DESCRIPTIVE STUDY OF RESUSCITATION PRACTICES IN VICTORIAN RESIDENTIAL AGED CARE FACILITIES**

**AUTHORS:** S Cartledge, J Bray, M Perkins, R Dwyer, A Crabtree, K Dyson, K Eastwood, K Detering, M Sellars, J Lowthian, K Smith, J Finn

*Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria*

**Background:** Survival from out-of-hospital cardiac arrests (OHCA) in older populations is poor (4%). Currently, 8% of OHCA attended by Ambulance Victoria occur in residential aged care facilities (RACF) where resuscitation is often not required or not provided prior to ambulance arrival.

**Aim:** To describe current resuscitation policies and practices in Victorian RACFs.

**Methods:** A cross-sectional survey, sent via mail and email to all Victorian RACFs (n= 760) between September 2018 and January 2019.

**Results:** We received 206 surveys (27% response rate). Respondents were typically the facility director/manager (33%) who had worked in the facility for <4 years (51%). The majority of facilities were state government (26%), private (24%) or community not-for-profit (22%). Over a quarter (28%) of facilities were co-located with an acute health service, and these were more likely to have resuscitation (85% vs 66%) or advance care planning (88% vs 64%) policies (both \(p < 0.001\)). Most facilities (78%) had a Registered Nurse and cardiopulmonary resuscitation trained staff rostered at all times (83%). However, resuscitation equipment was basic, consisting of oxygen/suction (91%) and airway/ventilation equipment (64%). Few facilities had automated external defibrillators (37%) or resuscitation drugs (23%)- these were typically in co-located facilities (11% vs 53%, \(p <0.001\)).

**Conclusion:** RACFs facilities, specifically those not co-located with an acute facility, are not be prepared for resuscitation due to a lack of appropriate policies and resuscitation equipment.
Out-of-Hospital Cardiac Arrest (OHCA) survival has gradually improved over the last decade in Western Australia (WA). A systematic approach to strengthening the chain of survival was accelerated in 2016/17 by St John, in an attempt to further increase survival from OHCA. Focus was put on ‘000’ call handling to improve OHCA recognition, telephone CPR and ambulance dispatch. Public Access AED program promotion was enhanced to increase device availability. As part of fostering a culture of excellence, a high-performance model of resuscitation was introduced into ambulance practice in mid-2018 to optimize CPR quality. The year 2018 saw a significant increase in the number of survivors (n=170) over the same period in 2017 (n=113); reflecting an increase in survival to hospital discharge for OHCAs with resuscitation attempted from 9.6% to 14.8%.

Using data from the WA OHCA Database (linked to State Death Records), we sought to understand what contributed to these recent changes in OHCA survival. We considered changes in population, case mix and aspects of the chain of survival, including bystander interventions. These analyses showed that whilst there was no change in patient/arrest characteristics, the number of survivors who received a bystander AED shock increased from 17 in 2017 to 40 in 2018.

Conclusion – Identifying areas for review and investing in system improvements, fostering cultural changes in resuscitation performance and promoting public access AED availability and use, are thought to have contributed to an increase in OHCA survivors in 2018 in WA, but will require ongoing monitoring to confirm.

Context: Currently only 1 in 10 people survive an out of hospital cardiac arrest (OHCA) in Australia. Heart Safe Community (HSC) is a public health initiative implemented by the Heart Foundation in partnership with Ambulance Victoria (AV). The project aims to improve survival from OHCA by building community awareness of cardiac arrest, increasing confidence and skills to respond and improving public access to AEDs.

Methods: In 2017 the University of Melbourne was commissioned to evaluate the implementation, effectiveness, partnerships and sustainability of the HSC pilot in Tatura, Victoria. Mixed methods were used including local evaluation data; HSC Project team workshops; and a community stakeholder workshop.

Results: The HSC pilot has shown an improvement in local community capacity to respond to OHCA as demonstrated by increased community knowledge, confidence and skills to: call Triple Zero; commence chest compressions; and acquire and use an AED. HSC activities have continued in the community following the conclusion of the project.

Implications: Key HSC enablers include recruitment of local project coordinators and visible Ambulance service involvement; utilising pre-existing community volunteer networks and organisations. Observed challenges include reaching all population cohorts and reliance on community volunteers for sustainability. Recommendations for future HSC initiatives include: 1) recruit local community staff to coordinate HSC initiatives; 2) establish a local community steering group to have ownership, voice and to engage existing community volunteers, networks and organisations 3) develop a sustainability strategy to maintain local community volunteer capacity and evaluation of HSC initiatives.
Introduction: Advance care planning (ACP) is the documentation of a persons’ values and preferences in relation to their healthcare. It allows people to make informed decisions for their future with focus on patient autonomy. ACP is not a simple discussion regarding resuscitation, but all aspects of care.

Relevance: Advances in medical technology are increasing management options. Some options are invasive, burdensome and unlikely to improve clinical outcomes. Therefore it is timely to discuss choices with patients before a situation arises. ACP directs management based on patient’s wishes and their clinical state. ACP is not designed to restrict access to treatment, but encourages open dialogue to empower patients. Critically, it minimises a paternalistic approach to care. For first responders, ACP reduces futile transfers and unwanted interventions, and enables optimal resource management.

Limitations: The primary limitation with ACP is lack of access for first responders. Without citing documents, therapies are commenced, even against patients’ wishes. This is the antithesis of ethical practice, and leads to avoidable costs on the healthcare system. This has been noted previously, with a call for better access. In Australia, each state has different legislation and documentation for ACP, leading to lack of consistency.

Conclusion: Ongoing research is needed to assess the efficacy of ACP in reducing unwanted and inappropriate management options for patients. It is imperative to encourage ACP as it promotes the delivery of care that upholds patient autonomy, which is the foundation of ethical medical practice.

References
**LOCATION OF TRADE EXHIBITORS & POSTER PRESENTATIONS**

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