

SWAN 24

# TRAUMA

CONFERENCE

29 – 30 JULY 2016

SCIENTIFIC PROGRAM



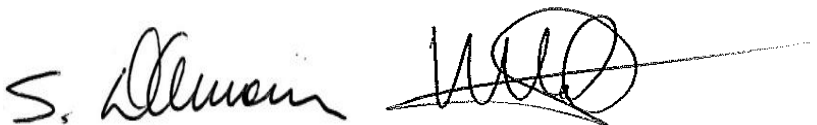
Dear Colleagues,

It is with very great pleasure that we once again welcome you to the 24th SWAN Trauma Conference. With another world renowned international faculty from Norway, Canada, Colombia, Estonia and New Zealand and our own national experts in trauma care, this conference promises to be a superb mix of lectures, great debates, interactive case scenarios, key note speeches and Q and A sessions.

Our regular SWAN delegates will see that we have undergone some changes in particular with the program and website. This year we have expanded the program with multiple concurrent sessions which gives you the chance to pick and choose what particularly interests you or you may have expertise in. Of course there will still be the major plenary sessions for all to attend and we have brought back our free paper session for all to have a chance at presenting their work and research.

This year we will examine quality in trauma care as well as have heated discussions on the controversies and complexities of trauma diagnosis and management including the problems of managing the extremes of age. Our very popular annual great debate will again entertain and provoke and our real life case scenarios will continue to generate great dispute, deliberation and discourse. We will move from the resuscitation room to the intensive care unit and finally to the operating room discussing various demanding aspects of caring for the multiply injured patient. We will also have a session that moves us away from Level one centre care to the rural setting which presents its own enormous challenges. Our keynote address will explore the difficult question "Are We Doing Enough as Trauma Centres in Injury Prevention?"

We look forward to seeing you at Australia's leading Trauma Conference for an excellent two days of education, entertainment and inspiration. This conference will ensure you are up to date with the latest and greatest innovations and research in trauma management as well as give you the privilege of sharing the vast experience and knowledge of our faculty of experts as well as other delegates involved in trauma care.

The image shows two handwritten signatures. The signature on the left is 'S. D'Amours' in a cursive script. The signature on the right is 'Valerie Malka' in a more stylized, circular cursive script.

Dr Scott D'Amours

Dr Valerie Malka

Conference Convenors

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## Become a Trauma Leader

The University of Newcastle's Master of Traumatology program is the first of its kind in Australia, and is designed to combine formalisation of clinical experience with a postgraduate coursework qualification.

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Professor Zsolt Balogh, Program Convenor



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# General Information



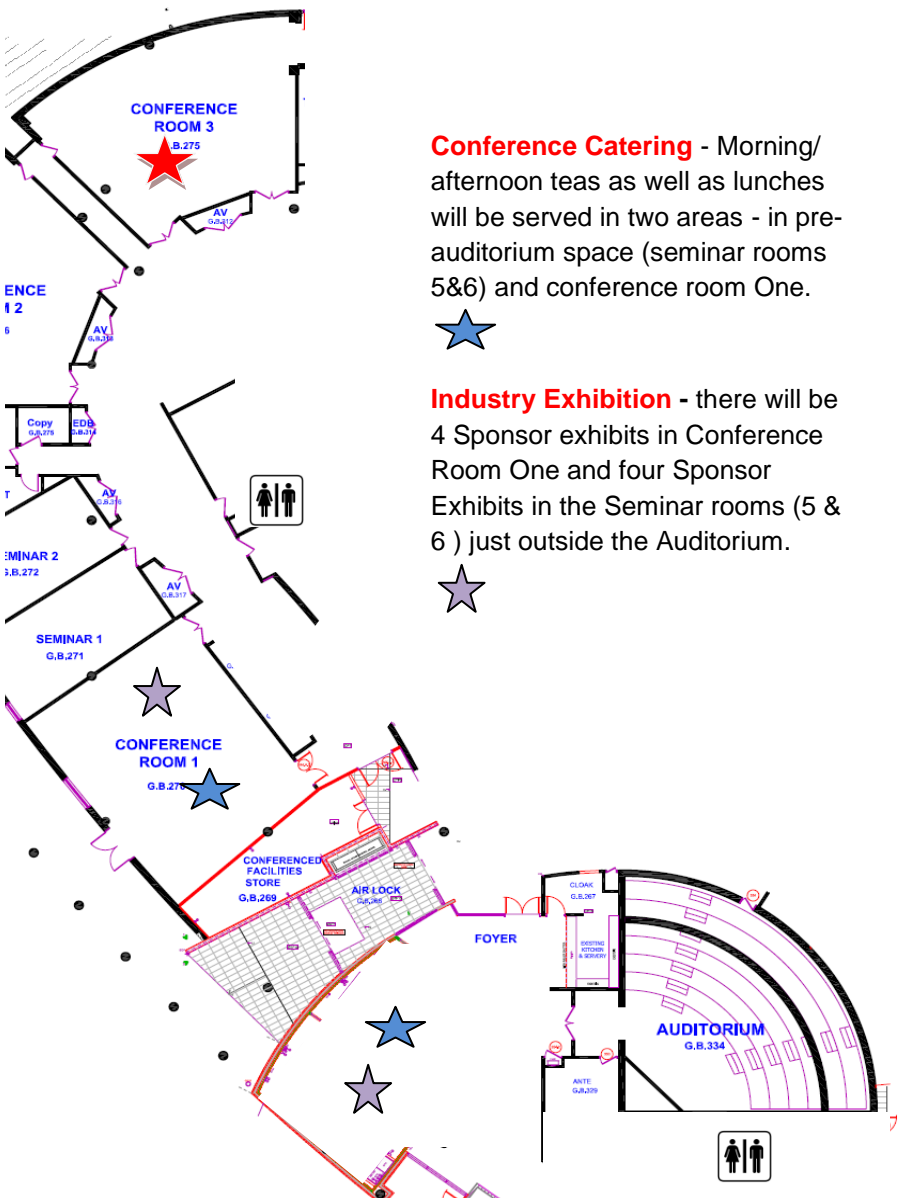
**Venue** - Thomas and Rachel Moore Education Centre

**Car Parking - 3 parking stations -**  
 1. Underground car park, below the Thomas and Rachel Moore Education Centre, corner of Goulburn and Elizabeth Streets.

2. Multi-storey car park located at the corner of Campbell and Forbes Streets, Liverpool.

3. Third car park beneath the Clinical Building entrance on the corner of Lachlan Street and Hart Street at entrance J.

Opening hours: 6.00am – 9.30pm.  
 approx. \$24.00 per day



**Conference Catering** - Morning/afternoon teas as well as lunches will be served in two areas - in pre-auditorium space (seminar rooms 5&6) and conference room One.



**Industry Exhibition** - there will be 4 Sponsor exhibits in Conference Room One and four Sponsor Exhibits in the Seminar rooms (5 & 6) just outside the Auditorium.



**Registration Desk** - Desk will be located just outside the Auditorium. Name badges and satchels must be collected prior to entry to the conference.

**Scientific Program** - Plenary sessions will be run in the Auditorium. Concurrent sessions will be run in the Auditorium and Conference room 3.



## General Information

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**Wine and Cheese Function** - will be held in the pre- auditorium space in seminar rooms 5-6. Please join us at 5pm on Friday for a drink and nibbles and meet your fellow colleagues and catch up with friends.

**SWAN 24 Feedback** - go to link emailed to you preconference



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**JOANNE BANFIELD, RN, BA**

Joanne is the Manager for Trauma Injury Prevention at Sunnybrook Health Sciences Centre in Toronto, Canada's first and largest trauma centre. Joanne began her nursing career in 1974 and currently runs the RBC First Office for Injury Prevention, which includes the flagship P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) Program and iNavigait – a pedestrian education and awareness program. She previously managed the trauma unit at Sunnybrook. Joanne is actively and passionately involved in injury prevention at the local, provincial, national and international level and serves on a number of committees, associations and boards including the Trauma Association of Canada, The Dr. Tom Pashby Sports Safety Fund, the Fire Marshal's Public Fire Safety Council, the CDC, UN and WHO. Joanne was the Medical and Injury Prevention Chair for the 2012 Ontario Summer Games. She was awarded the Ontario Ministry of Transportation - Road Safety Achievement Award in 2005 and in 2014 was the first recipient to receive a Lifetime Achievement Award from the Ministry of Transportation for her contribution and commitment to road safety.



**TINA GAARDER, PhD, MD**

Dr Gaarder is a Consultant General and Trauma surgeon, Director of Trauma at Oslo University Hospital, Ullevål (OUH U), the only high volume trauma center in Norway. She is the founder of the OUHU formal Trauma Service in 2005 and later the national advisory board for trauma. Responsibilities include clinical, administrative, educational and quality improvement in trauma. Head of the Norwegian Surgical Society Committee on Trauma. Involved in the development and revision of the national trauma system. Running national trauma educational programs and involved in international trauma surgical training. President elect in IATSIC (International association for trauma surgery and intensive care). She runs a broad trauma research program.



**ANDERS HOLTAN, MD**

Anders Holtan is a consultant anesthesiologist working at Oslo University Hospital in Norway. He takes special interest in emergency medicine and trauma. He has his clinical work both pre hospital and in hospital, and also takes part in education, teaching and quality assurance. A part of his job is trauma prevention as he is medical adviser for National accident analysis groups after fatal road accidents. Holtan is also responsible for disaster preparedness and contingency plans in the division of emergencies and critical care in Oslo University Hospital. As a member of the DATC international committee and being an international DATC instructor, he is also taking an active role in developing DATC into an international education platform for anesthesiologist taking interest in trauma.



**MIKE HUNTER, MD**

Dr Hunter is a Consultant General Surgeon, Consultant Intensivist, as well as Professional Practice Fellow in Surgery at the Dunedin School of Medicine of the University of Otago. He was for 9 years (2006-2015) the Clinical Leader in Intensive Care at Dunedin Hospital. He is also the Medical Director of the Otago Rescue



Helicopter Trust, the chair of the Southern Region Emergency Care Co-ordination Team and a champion within the Southern DHB for Quality Improvement and Lean methodology in healthcare. He is currently leading the drive to establish a robust Trauma Service in the Southern District. He also served in the NZ Army for 35 years as a Field Surgeon. He is actively involved in the Early Management of Severe Trauma Course programme and the Care of the Critically Ill Surgical Patient Course programme of the Royal Australasian College of Surgeons. When not working, Mike is a keen hunter and fisherman, likes to bike and run (well hobble perhaps) and loves growing vegetables and making stuff in his workshop.



#### **MARIA FERNANDA JIMENEZ, MD**

General Surgeon, Professor of Surgery, Universidad del Rosario Hospital Universitario Mayor- MEDERI, Bogota, Colombia, Chair International Injury Care Committee Chief Region 14 (Latin America and the Caribbean), American College of Surgeons-Committee on Trauma. Chair Membership Committee Panamerican Trauma Society, Vice- President Asociación Colombiana de Cirugía, Former President Asociación Colombiana de Trauma



#### **PÅL AKSEL NÆSS, MD**

Dr Naess is a consultant in the Department of Traumatology and the Dept of Pediatric Surgery at Oslo University Hospital Ullevål in Oslo, Norway and Chief of Traumatology (Col) in the Norwegian Armed Forces Medical Services. He is a trauma and surgical educator and board member of the Norwegian Surgical Society Committee on Trauma. He is actively involved in DSTC nationally and internationally and is also an ATLS Director. He is a member of the Educational Subcommittee, IATSIC and the Visceral Trauma Subcommittee, ESTES.



#### **PEEP TALVING, MD, PhD, FACS**

Dr Talving is a Trauma Surgeon, Professor of Surgery at the University of Tartu and Director of Acute Care Surgery Division of the North Estonia Medical Center in Tallinn, Estonia. He was previously an Assistant Professor of Surgery and Emergency Medicine at the Division of Trauma and Acute Care Surgery at the University of Southern California, Keck School of Medicine and an Attending Surgeon at the Los Angeles County General Hospital. He defended his PhD thesis at the Karolinska Institute in Stockholm, Sweden. Dr. Talving is a fellow of the American College of Surgeons and the American Association for the Surgery of Trauma (AAST). He is the National Chair and Course Director of ATLS in Estonia.



#### **TIMOTHY K WILLIAMS, MD, RPVI, LtCol, USAF, MC**

Dr. Williams is an active duty surgeon in the United States Air Force, at David Grant Medical Center, Travis Air Force Base, California. He underwent general surgery training at Thomas Jefferson University Hospital in Philadelphia, Pennsylvania, USA and vascular surgery fellowship training at The Johns Hopkins Hospital in Baltimore, Maryland, USA. Based on deployment experience treating injured warfighters who succumbed to hemorrhage following traumatic injury on the battlefield, he was inspired

to seek new methods to address this common cause of preventable death. Over the past several years, he has been actively engaged in several translational large animal research efforts aimed at novel resuscitation paradigms for non-compressible truncal hemorrhage. Additionally, he has been actively developing new technology to facilitate the investigation of the complex hemodynamics of hemorrhagic shock through automation, as well as developing devices capable of delivering this therapy in a clinical setting. Future research efforts will aim to solidify these novel strategies and develop expanded applications of this technology to address the need for prolonged field care as well as critical care management.

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### **BRIAN BURNS**

Emergency Physician. Prehospital & Retrieval Specialist, Sydney HEMS. Trauma Director, Orange Health Service. Brian is an Emergency Physician in Northern Sydney LHD. He is also a prehospital and retrieval specialist and Director of Research with Sydney HEMS. He is the Trauma Director for Orange Health Service, NSW and A/Professor of Emergency Medicine, Sydney University. Brian has numerous roles in the Research Advisory Committee, ITIM & ECI, Agency for Clinical Innovation, NSW.

### **ERICA CALDWELL**

Erica is the Trauma Nurse Coordinator at Liverpool Hospital. She provides leadership and expert clinical advice to patients, carers and nursing, medical and allied health staff in trauma related matters. She holds qualifications in general, psychiatric and midwifery nursing as well as BA Psychology and had broad experience in emergency nursing, education, community mental health and occupational health management prior to specialising in trauma nursing. Erica is a recognised expert in trauma systems, monitoring patient outcomes and key performance indicators. She supports the trauma service in Abbreviated Injury Scale coding, research and education.

### **JOVY CARPIO**

Dr Carpio is a General and Trauma Surgeon from the Philippines who is currently the Trauma Fellow at Liverpool Hospital. Dr Carpio is a fellow in the Trauma Department at Liverpool Hospital. She completed 5 years of general surgery training at Philippine General Hospital in 2009 gaining a Diploma with the Philippine Board of surgery in 2010. She worked as the trauma fellow at Liverpool Hospital in 2011 and 2012. Jovy has a passion for rural medicine and surgery working in Darwin for 2 years enjoying cultural challenges. She believes good communication with patients is an integral part of providing holistic surgical treatment. She has presented at conferences and workshops detailing how to do much with little using innovative approaches. Jovy is a keen educator and is an EMST and DSTC instructor. One of her long term goals is to work for an overseas aid organisation once family commitments permit.

### **JOHN CROZIER**

Dr Crozier is a Vascular and Trauma surgeon on staff at Liverpool Hospital. He is the Head of the Vascular Surgery Department Liverpool Hospital and Medical Director of the Liverpool Hospital Vascular Diagnostic service. He has been involved with DSTC teaching since 1996. He is Chair of the National Trauma Committee of the Royal Australasian College of Surgeons. He was appointed Brigadier, Director General Health Reserves - Army, with effect from Jan 2012.

### **SCOTT D'AMOURS**

Dr Scott D'Amours is a Trauma Surgeon & Director of Trauma at Liverpool Hospital in Sydney. He is an enthusiastic trauma & surgical educator and senior lecturer in Trauma at the University of New South Wales. Scott is a member of the Royal Australasian College of Surgeons Trauma Committee & is currently the Chairman of DSTC Australasia as well as a member of the International DSTC Committee of IATSIC.

### **KERIN FIELDING**

A/Prof. Kerin Fielding was the first Female Orthopaedic Surgeon in NSW and has established a successful career in Wagga over the past 25 years working at the Wagga Wagga Base Hospital and Calvary Healthcare Riverina. She has a special interest in the surgery of Hip, Knee and Spine. She is a leader in surgical education and training and is the Chair of the NSW Clinical Surgical Training Council for HETI, and teaches Medical Students for Notre Dame University. Kerin is also a senior course director of the Early Management of Severe Trauma course for the Royal Australasian College of Surgeons and serves on the National EMST committee. Kerin is a strong advocate for the treatment for osteoporosis and has campaigned publicly on this issue. She was a member of the National scientific committee of Osteoporosis Australia and on the executive for the National Hip Fracture Registry. Prof Fielding was elected last year to as a councillor for the Royal Australian College of Surgeons. She is Chair for the Research Audit and Academic Surgery Committee and received a

College of Surgeons medal for service to education and Rural Surgery in NSW in 2012. Kerin is married to A/Prof. Joe McGirr Rural Dean of the University of Notre Dame in NSW and has four children. Her other great passions in life are cooking and all things French and she is a qualified Pastry Chef. She spends her holidays renovating an old farmhouse in rural France.

## **AILENE FITZGERALD**

Dr Fitzgerald is a General and Trauma Surgeon and Director of the Shock Trauma Service at Canberra Hospital. She chairs the ACT Trauma Committee, is the regional representative for ACT on the RACS Trauma SubCommittee, a Committee member of the Australasian Trauma Society and Deputy Chair of RACS ACT. She is also active as a Commander in the Navy Health Reserves having joined the Royal Australian Navy in 1991 as an undergraduate medical student. She served in a number of establishments and ships and completed a number of deployments prior to transferring to the Reserves in 2000 to pursue surgical training. She remains active in the Navy Health Reserves as the Assistant Professional Liaison Officer for Navy Surgeons and participates regularly in Defence training forums.

## **SALLY FORREST-HORDER**

Sally has been the Trauma Case Manager at Liverpool since 2003. Sally is an experienced Emergency nurse, having experiencing trauma in rural remote and metropolitan centres since 1999. Her qualifications include Bachelor of Nursing, Graduate Certificate in Emergency and Orthopaedic Nursing, First Line Emergency Care (FLEC trained), Trauma Nursing Core Course, Disaster Training; FAST accredited and is an EMST co-ordinator. Sally's role as Trauma Case Manager is to co-ordinate the care of the trauma patient, from arrival to discharge.

## **NEVENKA FRANCIS**

Nevenka joined the Trauma Department in 2005, prior to this she spent six years working in Liverpool ICU, and two years as the Hospital MET coordinator. Her qualifications include Diploma in Health Sciences, Graduate Certificate in Intensive Care and Masters in Public Health she is also an EMST coordinator. In August 2008 she completed her accreditation to become accredited to do FAST scans. The Area Coordinator collects data and reviews trauma management and outcomes for regional trauma admissions. One of the other roles is to monitor all patients that are transferred in via the Trauma Hotline.

## **BRUCE FRENCH**

Dr Bruce French is Head of Cardiothoracic Surgery at Liverpool Hospital and has vast experience in Trauma. He worked as a consultant cardiothoracic surgeon at Royal Prince Alfred Hospital from 1994-2003 and at Liverpool Hospital since 1996. He served as Chairman of the Clinical Examination Committee of Surgical Training, a member of the NSW State Committee, the Surgeons Supervisor Committee and the Rowan Nicks Foundation Committee. He has been actively involved with "Open Heart International" since 2006 when he made his first to Myanmar and has also been a team member in Tonga, Fiji and Vietnam. Dr French has been actively involved in the training of many cardiac surgeons and their teams in three hospitals in Yangon.

## **ALAN GILES**

Dr Alan Giles graduated from UNSW in 1986 and gained his Fellowship in Emergency Medicine in 1995. Since then he has worked mainly in the South West of Sydney as an Emergency Physician at Liverpool Hospital and later Campbelltown Hospital. Presently Dr Giles works as a medical educator in the South West of Sydney and clinician in the Sydney Adventist Hospital. His interests are in medical education, especially Simulation and critical care ultrasound. Happily married for 20+ years he has 2 daughters at university, 2 annoying cats and a long living deaf, blind, aromatic, arthritic dog called Koichi. One day he may finally take good travel photos and speak passable conversational Spanish.

## **BERNIE HANRAHAN**

Bernie is an Senior Anaesthetist at Liverpool Hospital with an interest in trauma and airway management. He has been a Retrieval Specialist with CareFlight for 20 years and is currently Air Medical Director of CareFlight International. Bernie is a Retrieval Consultant for Ambulance Service of NSW and has been in the Australian Army Reserve for 20 years holding the rank of LT Colonel.

## IAN HARRIS

Professor Harris is Professor of Orthopaedic Surgery at UNSW and is an active clinician and researcher based in Liverpool. His clinical interests are trauma related and his academic interests are in clinical research, including multicentre randomized trials. He has published widely on surgical outcomes and is the author of the recent book "Surgery, the Ultimate Placebo".

## MICHAEL KERNOHAN

Dr Kernohan is a Plastic and Reconstructive surgeon at Liverpool Hospital. He trained in the UK, is dual qualified in both Medicine and Dentistry and holds Royal College fellowships in both Dental Surgery and Plastic Surgery. He has subspecialist interests in Head and Neck Cancer, Facial reconstruction and Cranio-maxillofacial trauma. In addition, he has a research degree in Speech and Swallowing. He worked as a consultant in a large UK Level 1 Trauma and Burns Centre in Newcastle UK and moved to Sydney in 2014.

## MARY LANGCAKE

Dr Langcake trained as a General Surgeon in Adelaide and completed Post Fellowship training in Upper GI Surgery at Westmead Hospital. She has a major interest in the management of severely injured trauma patients. As a Squadron Leader with the Royal Australian Air Force, she deployed to Afghanistan in 2008 where she dealt with trauma far outside the range of normal civilian practice. This experience, coupled with a passion for improving outcomes for injured patients saw her offered the role of Trauma Director at St George Hospital shortly after her return from military service.

## PATRICK LISTON

Patrick is an intensivist and anaesthetist with an interest in trauma, ultrasound, retrieval and pre-hospital care. He completed undergraduate training at Flinders University in Adelaide and speciality training in NSW. He is currently a senior specialist at Liverpool ICU.



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## **SUHRID LODH**

Dr Lodh is an Interventional Radiology Staff Specialist at Liverpool Hospital (Sydney). He holds an academic appointment with the UNSW Clinical school at Liverpool Hospital and has formerly held teaching appointments at the University of Wollongong and University of Sydney (RNSH). He has also been actively involved in the education of Radiology registrars, Junior medical staff, radiographers and nursing staff since 2010.

## **VALERIE MALKA**

Dr Valerie Malka is a Trauma and General Surgeon at Liverpool Hospital. She was the previous Director of Trauma Services for Westmead Hospital and Sydney West Area Health Service for over a decade. She is an EMST Director and DSTC Instructor with a great passion for trauma and acute care surgery. With special interests in education and quality assurance she has worked extensively in patient safety and the maintenance of ethics in healthcare. Valerie has worked with the International Committee of the Red Cross and the International Rescue Committee and holds a Diploma in International Humanitarian Assistance from Geneva University and a Masters Degree in International Public Health with a major in Humanitarian Law. She also holds a Masters degree in Journalism and works freelance writing medical, health and wellbeing articles.

## **BRONTE MARTIN**

Bronte is currently Director of Nursing (Trauma & Disaster) at the National Critical Care Trauma Response Centre, providing clinical governance and oversight for Trauma Services at Royal Darwin Hospital, NCCTRC Education & Training program, and the Australian Medical Assistance Team deployable Field Hospital capability. Recent deployments include Tropical Cyclone Pam, Vanuatu in March 2015 and Philippines super-Typhoon Haiyan in November 2013. Bronte has also been a member of the Australian Defence Force for the past 15 years in the Royal Australian Air Force Specialist Reserve with several overseas Operational experiences. Most recently, Bronte has just returned from undertaking a 6-month secondment in 2015 with the World Health Organisation Global Emergency Medical Teams Secretariat in Geneva to develop and establish a Global Classification, Mentorship & Verification program; ensuring validated, quality international Emergency medical care is delivered in response to Sudden Onset Disasters.

## **KATE MARTIN**

Dr Martin is a full-time General and Trauma Surgeon at the Alfred Hospital. Her trauma-specific interests are resuscitation, abdominal, pelvic and chest trauma. She is the supervisor of General Surgical Education and Training for the Alfred Hub, as well as a Director with the Early Management of Severe Trauma (EMST) and Definitive Surgical Trauma Care (DSTC) faculties. Kate is the secretary of ANZAST- the Australian and New Zealand Association for the Surgery of Trauma and the President of the Australasian Trauma Society Executive.

## **NAVIN NILES**

Associate Professor Niles is an accomplished Endocrine and Head & Neck Surgeon specializing in thyroid, parathyroid, adrenal and salivary gland surgery. He is a full member on the international Association of Endocrine Surgeons. He performs over 400 endocrine procedures annually. Associate Professor Niles is the head of translational research in thyroid and head & neck cancer at the Ingham Institute for Applied Medical Research and Western Sydney University. He has a keen interest in teaching and is the supervisor of surgical training for the southern rotation for the Royal Australasian College of Surgeons. Having pioneered Robot assisted thyroid surgery in Australia, Associate Professor Niles is the most experienced surgeon in removal of the thyroid with no neck incision. He has set the benchmark in scar-less neck thyroid surgery. This allows him to offer patients a wider spectrum of care from the traditional open thyroid/parathyroid operations to minimally invasive and scar-less neck surgery. Most importantly this gives patients more autonomy and greater choice.

## **REBECCA OGILVIE**

Rebekah is a Trauma Nurse Practitioner with over 18 years emergency nursing and trauma experience, and is the current Trauma Coordinator at The Canberra Hospital. She completed a Master of Nursing (Critical Care) at the University of Sydney in 2004 and was awarded the Elsevier Australia Prize for Critical Care. Rebekah also completed a Master of Nursing – Nurse Practitioner (Trauma & Retrieval) through the University of Newcastle, graduating in 2009 with Merit. She is currently a Doctor of Philosophy Candidate with the University of Sydney, thesis title: Life threatening injury in young people aged 16-25 years; a mixed methods study.

## MICHAEL PARR

Professor Parr trained in anaesthesia, internal medicine and intensive care in the UK, New Zealand, USA and Australia. He is Director of Intensive Care at Liverpool Hospital, Sydney, Conjoint Professor University of New South Wales, and Director of Macquarie University Hospital Intensive Care and Clinical Professor Macquarie University. He is an editor of 'Resuscitation', Deputy Chair of the Australian Resuscitation Council and a member of ILCOR ALS committee.

## RYAN RUDOLPH

Dr Ryan Rudolph is an interventional radiologist and has been a staff specialist at Liverpool Hospital since 2011 and has also been appointed to Prince of Wales Hospital since 2014. He attends and presents at many local meetings and is an active member of IRSA, Interventional Radiology Society of Australasia. His particular interests are in vascular imaging and intervention, pain relief and injections, interventional and diagnostic oncology and urology, and radiation safety. He is an active contributor to the Urology MDT at Liverpool Hospital and the GIT MDT at Prince of Wales Hospital. He also works at a prominent private radiology practice one day a week.

## MARK SHERIDAN

Director of Neurosurgery at Liverpool Hospital.

## WAYNE WALLACE

Wayne is an Intensive Care Paramedic with NSW Ambulance and has previously worked for the Victoria Police and undertaken operational service with the Australian Army. Wayne has experience in providing emergency Out of Hospital Care in regions such as rural NSW, including snowfields, and metropolitan areas. With an interest in paramedic research and development, Wayne is actively involved in mentoring paramedics and takes part in providing training for future Intensive Care Paramedics for NSW Ambulance. Wayne is currently stationed in the South West Sector of Sydney, which attracts a high volume of medical and trauma cases, and will be part of the new Paramedic Response Network at Bankstown.

## MARTIN WULLSCHLEGER

Associate Professor Martin Wullschleger is a Swiss and Australian trained General and Trauma Surgeon, who is currently working at the Gold Coast University Hospital as the Medical Director of Trauma Services and Staff Specialist in the Acute Surgical Unit. Apart from his clinical commitments, he is a passionate teacher and researcher in the field of trauma management and trauma system development as well as in performing studies in soft tissue and fracture healing.



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**08:00 – 10:00 PLENARY SESSION - TRAUMA CARE - HOW GOOD ARE YOU?**
**Auditorium – Chair: Michael Parr**

08:00 – 08:15	Welcome	Scott D'Amours
08:15 – 08:30	What is Quality and Safety in Trauma Care?	Mike Hunter
08:30 – 08:45	Factors Associated with Poor Outcomes	Ian Harris
08:45 – 09:00	Lessons Learnt from other Industries	Pal Aksel Naess
09:00 – 09:15	WHO – Emergency Medical Teams	Bronte Martin
09:15 – 09:30	Question Time with the Panel	
09:30 – 10:00	<b>CASE SCENARIO</b>	Chair: John Crozier
	<b>Panel:</b> B. Burns, M. Kernohan, N. Niles, R. Rudolph, T. Gaarder, W. Wallace, N. Francis	

**10:00 – 10:30 MORNING TEA**
**10:30 – 12:30 CONCURRENT SESSION - ISSUES AND CONTROVERSIES IN TRAUMA**
**Auditorium – Chair: Alan Giles**

10:30 – 10:45	Chest Tubes – What's the Problem?	Mike Hunter
10:45 – 11:00	Trauma Centre Mortality – What's acceptable?	Ailene Fitzgerald
11:00 – 11:15	Time Critical Trauma Interventions	Kate Martin
11:15 – 11:30	Reimaging Solid Organ Injury	Tina Gaarder
11:30 – 11:45	Alcohol and Trauma Capturing the Data	John Crozier
11:45 – 12:00	EVAC – Extending REBOA	Tim Williams
12:00 – 12:30	Question Time with the Panel	

**10:30 – 12:30 CONCURRENT SESSION - FREE PAPERS**
**Conference Room 3 – Chair: Peep Talving & Erica Caldwell**

10:30 – 10:45	Changes in Trauma Care Delivery at Gold Coast University Hospital	Elizabeth Wake
10:45 – 11:00	FEISTY - Fibrinogen Early In Severe Trauma Study	James Earls
11:00 – 11:15	Time to Haemorrhage Control in Unstable Trauma Patients:	Fadie Aziz
11:15 – 11:30	ANZ Hip Fracture Registry	Ian Harris
11:30 – 11:45	Bringing PARTY to Liverpool	Nevenka Francis
11:45 – 12:00	Rib Fracture Fixation - An Early Experience	Ana Galevska
12:00 – 12:30	Question Time with the Panel	

**12:30 – 13:30 LUNCH**
**13:30 – 15:00 CONCURRENT SESSION - TRAUMA PATIENT IN THE RESUSCITATION ROOM**
**Auditorium - Chair: Kate Martin**

13:30 – 13:45	Difficult Vascular Access	Anders Holtan
13:45 – 14:00	Routine Spinal Precautions – Is it for Everyone?	Mark Sheridan
14:00 – 14:15	NOACS	Alan Giles
14:15 – 14:30	Limitations of E-FAST	Brian Burns
14:30 – 14:45	The Importance of Debriefing	Joanne Banfield
14:45 – 15:00	Question Time with the Panel	

**13:30 – 15:00 CONCURRENT SESSION - TRAUMA PATIENT IN THE OPERATING ROOM**
**Conference Room 3 – Chair: John Crozier**

13:30 – 13:45	Pancreaticoduodenal Injuries – Best Approach	Maria Fernanda Jimenez
13:45 – 14:00	Pelvic Packing – Do We Need It?	Pal Aksel Naess
14:00 – 14:15	Mangled Extremities – Best Approach	Martin Wullschlegler
14:15 – 14:30	E.R. Thoracotomy – How I Do It?	Peep Talving
14:30 – 14:45	Splenic Preservation	Tina Gaarder
14:45 – 15:00	Question Time with the Panel	

**15:00 – 15:30 AFTERNOON TEA**

**15:30 – 17:00 PLENARY SESSION - MARIA SEGER KEYNOTE ADDRESS**  
**Auditorium – Chair: Valerie Malka**

15:30 – 16:00	Injury Prevention – Are We Doing Enough?	Joanne Banfield
16:00 – 16:30	<b>DEBATE</b> – Prehospital Thoracotomy is a Prehospital Autopsy	B Burns vs T Gaarder
16:30 – 17:00	<b>CASE SCENARIO</b>	Chair: Valerie Malka
	<b>Panel:</b> B.Martin, B.Hanrahan, A.Giles, M.Langcake, T.Williams, R.Rudolph, M.Wullschlegler	

**17:00 – 18:30 WINE AND CHEESE FUNCTION**

**SCIENTIFIC PROGRAM** **SATURDAY 30<sup>TH</sup> JULY 2016**

**08:30 – 10:30 PLENARY SESSION - TRAUMA - LET'S BE PROVOCATIVE...!**  
**Auditorium – Chair: Mary Langcake**

08:30 – 08:45	Are Low Volume and High Performance Compatible?	Kate Martin
08:45 – 09:00	TEG and ROTEM - What's the Use	Tina Gaarder
09:00 – 09:15	Laparoscopy in Trauma – Is there a Role	Ailene Fitzgerald
09:15 – 09:30	Catheter-based Interventions – Have We Gone Too Far?	Tim Williams
09:30 – 09:45	Question Time with the Panel	
09:45 – 10:30	<b>CASE SCENARIO</b>	Chair: Scott D'Amours
	<b>Panel:</b> K.Fielding, P.Liston, P.Talving, S.Lodh, J.Carpio, T.Gaarder, B.Burns, R.Olgilvie	

**10:30 – 11:00 MORNING TEA**

**11:00 – 12:30 CONCURRENT SESSION - CRITICAL CARE COMPLEXITIES**  
**Auditorium – Chair: Tina Gaarder**

11:00 – 11:15	The Role of ECMO	Michael Parr
11:15 – 11:30	Severe Head Injury – What Makes a Difference?	Peep Talving
11:30 – 11:45	Reducing Geriatric Mortality and Morbidity	Mike Hunter
11:45 – 12:00	Rib Fixation – Who and When?	Bruce French
12:00 – 12:15	Damage Control Resuscitation	Patrick Liston
12:15 – 12:30	Question Time with the Panel	

**11:00 – 12:30 CONCURRENT SESSION - RURAL AND REMOTE CHALLENGES**  
**Conference Room 3 – Chair: Ailene Fitzgerald**

11:00 – 11:15	Neurosurgery for Non-Neurosurgeons	Mark Sheridan
11:15 – 11:30	Who Needs to be Transferred to a Level One?	Pal Aksel Naess
11:30 – 11:45	Vascular Emergencies – Quick Fixes	John Crozier
11:45 – 12:00	Solid Organ Injuries without Angiography	Maria Fernanda Jimenez
12:00 – 12:15	Orthopaedic Trauma Limitations	Kerin Fielding
12:15 – 12:30	Question Time with the Panel	

**12:30 – 13:30 LUNCH**

**13:30 – 15:30 PLENARY SESSION - TRAUMA AND EXTREMES OF AGE**  
**Auditorium – Chair: Mike Hunter**

13:30 – 13:50	<b>DEBATE</b> - 70 is the New 50, Right?	A Giles vs M Langcake
13:50 – 14:05	Paediatric Trauma in the Pre-Hospital Environment	Bernie Hanrahan
14:05 – 14:20	Fragile Elderly Bones	Kerin Fielding
14:20 – 14:35	Operating Room	Peep Talving
14:35 – 14:50	Pitfalls in Paediatric Resuscitation	Brian Burns
14:50 – 15:00	Question Time with the Panel	
15:00 – 15:30	<b>CASE SCENARIO</b>	Chair: Michael Parr
	<b>Panel:</b> A.Giles, M.Fernanda, S.Lodh, P.Naess, W.Wallace, A.Holtan, M.Hunter, S.Horder	

**15:30 – 15:45 PRIZES AND CLOSE**

## **Scientific Program Abstracts**

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### **WHAT IS QUALITY AND SAFETY IN TRAUMA CARE?**

**Mike Hunter**

### **FACTORS ASSOCIATED WITH POOR OUTCOMES**

**Ian Harris**

There is an enhanced focus on outcomes after injury; not just mortality, but other outcomes such as pain, quality of life and mental health. Knowledge of the predictors of these outcomes can alert patients and practitioners to potential problems early, and knowledge of modifiable predictors allows us to improve outcomes. The relative role of injury, patient, treatment and system factors in trauma outcomes will be described.



## LESSONS LEARNT FROM OTHER INDUSTRIES

Pal Aksel Naess

Human factors account for a substantial part of errors in both medicine and aviation industry. Crew resource management (CRM) is a communication tool introduced in 1979 from work undertaken by the National Aeronautics and Space Administration (NASA). CRM was developed after the identification of human error as the primary cause of the majority of aviation accidents. The CRM focuses on integrated training of the entire crew in communication and teamwork to ensure an error-free flight. There has been a widespread implementation of CRM programs in health care, trauma included. Although there is little evidence of the effectiveness of CRM to improve patient outcome, improved team dynamics is considered to increase patient safety [1,2].

Near-misses are events in which harm is avoided because of chance or intervention. Near-miss analysis is part of routine for quality improvement in high reliability organizations (HROs). Although near-misses and subsequent adverse events are more frequent in healthcare settings than in most high-risk industries, routines for systematic reporting and analysis of near-misses are lacking in most healthcare institutions. A simple approach to near-miss investigations as an integrated part of the institutional quality improvement program would have potential impact on clinical outcomes [3].

1. Hughes KM, Benenson RS, Krichen AE et al. A crew resource management program tailored to trauma resuscitation improves team behavior and communication. *J Am Coll Surg* 2014; 219: 545-551.
2. Reeves S, Kitto S, and Masiello I. Crew resource management: how well does it translate to an interprofessional healthcare context? *Journal of Interprofessional Care* 2013; 27: 207-209.
3. Van Spall H, Kassam A, and Tollefson TT. Near-misses are an opportunity to improve patient safety: adapting strategies of high reliability organizations to healthcare. *Curr Opin Otolaryngol Head Neck Surg* 2015; 23: 292-296.

## WHO – EMERGENCY MEDICAL TEAMS

Bronte Martin

### Global Emergency Medical Team Classification & standards

The World Health Organization (WHO) Global Emergency Medical Team (EMT) Initiative aims to reduce the loss of lives and prevent long-term disabilities as a result of sudden onset disasters and outbreaks through the rapid deployment and coordination of quality assured Emergency Medical Teams; Preserving Health, Protecting Dignity and Saving Lives. The EMT Initiative supports member states, NGOs and international organizations by identifying best practice and minimum standards in clinical care, operational field logistics and coordination in austere environments.

The Australian Medical Assistance Team (AUSMAT) program is funded by Australia's Department of Health to maintain a standby national and international EMT deployment capability to sudden onset disasters (SODs) and medical emergencies throughout the Asia-Pacific region, including a fully self-sufficient, Type 2 Surgical Field Hospital. Recent deployments include 2013 super-typhoon Haiyan (Philippines) and Tropical Cyclones Pam in 2015, (Vanuatu) and Winston in 2016 (Fiji) respectively.

There has been significant progress and transformative changes implemented in the quality and coordination of EMT responses to sudden onset disasters following the global lessons noted in Haiti Earthquake. International response operations in the Philippines, West Africa, Vanuatu and more recently Nepal have highlighted the need for flexible and effective coordination mechanisms that take into account the local context and operational environment. The Global EMT Classification, Verification and Mentoring program was introduced by WHO in 2015, ensuring a transparent, equitable and supportive process for validated, quality assured international Emergency medical care is delivered in response to Sudden Onset Disasters.

## **TRAUMA CENTRE MORTALITY – WHAT’S ACCEPTABLE?**

**Ailene Fitzgerald**

What can we deduce from trauma mortality statistics, to what extent are they reflective of standards of care and what is acceptable?

We often use trauma mortality statistics as a performance measure within our systems of care. However, reducing trauma mortality is a far greater task than optimizing our resuscitation and operating skills within trauma centres. Some of the biggest advances in reducing trauma-related injuries and deaths have been the result of preventative health reforms implemented by government after injury data provided supportive evidence. Legislation resulting in harm reduction has included mandatory wearing of seatbelts, blood alcohol limits for drivers, mandatory bicycle helmets and more stringent alcohol supply laws. Further advances in preventative strategies are reliant on accurate data collation and continued advocacy work by key stakeholders such as RACS and will contribute to reducing preventable trauma deaths.

Despite a huge disparity in trauma mortality globally, we have seen significant improvements in first world countries since the development and implementation of an organized system of trauma care. Led by the US in the 70s and 80s, several countries including Australia, have benefitted from adopting a similar approach. With improved data collection and surveillance capabilities, we must constantly assess our trauma systems to ensure the highest level of care. We must challenge ourselves to do better and identify ways of achieving this through collaboration, research, education and quality assurance measures within our systems of care. What is acceptable? No preventable death is “acceptable” and this must be our continual aim.

## TIME CRITICAL TRAUMA INTERVENTIONS

Kate Martin

There are a number of interventions performed in Trauma that when performed in a timely fashion, will minimize mortality and morbidity. With a focus on trauma reception and resuscitation, and the application of the principles of EMST, the need for the following interventions should be considered:

1. Early definitive airway for patients with severe TBI,
2. Early ventilatory support for patients with severe chest wall injury, specifically flail chest injury,
3. Blood component resuscitation in the hypovolemic, shocked patient,
4. Early definitive control of haemorrhage
5. Resuscitative thoracotomy in the severely shocked patient with pericardial tamponade,
6. Early definitive decompression of intra-cranial haematomas causing mass effect

## FOLLOW-UP IMAGING IN SOLID ORGAN INJURIES

Tina Gaarder

Nonoperative management (NOM) has become the treatment modality of choice in most patients sustaining blunt solid abdominal injuries, defined here as spleen, liver, kidney and low grade pancreatic injuries. Data are lacking on the management of adult patients once NOM with or without angioembolization is undertaken, and the necessity for routine post-injury CT scanning is debatable for all solid organs. Existing studies suggest, however, a significant risk of complications for all solid organ injuries, mandating vigilance in order to identify clinical signs of complications like delayed bleeding, abscesses and various leaks as triggers for reimaging.

For splenic injuries, the recent updated EAST practice management guidelines do not support routine follow-up CT scans as they tend not to influence management. This view is supported by a recently published Delphi study from the Amsterdam Medical Centre. Some studies describe the development of pseudoaneurysms (PSAs) within 48-72 hours post injury, requiring intervention. Our group traditionally performed early follow-up imaging, but failed to identify PSAs in embolized spleens, and thus have restricted follow-up imaging to non-embolized grade 3 injuries only as all our NOM grade 4 and 5 have undergone SAE.

For liver injuries, existing evidence fails to support routine follow-up imaging. Level 3 evidence suggests restricting follow-up radiology to patients with clinical signs of ongoing bleeding, infection, increasing abdominal pain, jaundice or increase in transaminases.

Current guidelines state that routine repeat imaging for renal trauma can be safely omitted in grade 1-4 injuries, as long as the patient is clinically well. Most studies confirm that clinically relevant complications are symptomatic.

Pancreatic injuries represent a diagnostic challenge, are often diagnosed late, and are associated with a high complication rate. The aim is to rule out or confirm a pancreatic duct injury, mandating operative intervention. Follow-up radiology with the use different modalities should then dictated by the clinical course. CT scanning in young people carries a long-term risk of malignancy and ophtalmologic damage. Reducing the amount of radiation exposure is important, and alternative radiological modalities should be considered when possible. Contrast enhanced ultrasound and MRI has shown promising results and should be considered.

1. [www.east.org](http://www.east.org) for updated guidelines re liver and spleen
2. Bryk DJ, Zhao LC. Guideline of guidelines: a review of urological trauma guidelines. *BJU Int* 2016;117:226-234

**EVAC – EXTENDING REBOA****Timothy Williams**

Haemorrhage remains a leading cause of death in both military and civilian populations. For injuries to the torso, causing incompressible truncal haemorrhage, options to bridge the gap between injury and definitive haemorrhage control are limited. While emerging techniques such as Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) are effective at controlling haemorrhage, the duration of intervention is limited by progressive distal ischemia, as well as adverse effects on proximal vascular beds. Endovascular Variable Aortic Control (EVAC) builds upon the principles of REBOA, whereby haemorrhage can be limited by reducing blood flow to the site of injury. However, EVAC advocates for early restoration of limited blood flow to downstream vascular beds in an effort to maintain organ viability, as well as reducing the adverse effects on proximal tissue beds from exposure to supraphysiologic pressure and flow. By providing permissive regional hypoperfusion to distal vascular beds, the progressive ischemic burden incurred with complete aortic occlusion (REBOA) is mitigated. While critics of this concept rightfully highlight the real potential for ongoing bleeding through partial flow restoration prior to definitive haemorrhage control, our preliminary data in a large animal model of mixed arterial and venous liver injury suggest tolerable rates of ongoing haemorrhage, if not establishment of durable haemostasis.

In contrast to REBOA where the duration of intervention is finite, EVAC may be sustainable for extended periods. In this regard, EVAC as a conceptual therapy is ideally suited for scenarios where a delay between injury and intervention is anticipated, such as military transport from remote, austere environments and for civilian transport from rural settings. Due to the theoretical decreased physiology burden of EVAC as compared to REBOA, the potential exists to apply this therapy earlier in the course of a resuscitative effort. Another virtue of this strategy is to potentially open the door for non-operative management of certain injury patterns that previously mandated surgical intervention. Additionally, EVAC may have potential applications beyond trauma such as high risk surgery, obstetrics and other shock states. In conclusion, EVAC is poised to usher in a new era of resuscitation for trauma and beyond, serving as a key adjunct to augment our existing surgical capabilities and extend our reach into increasingly remote locations.

## FREE PAPER SESSION

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### CHANGES IN TRAUMA CARE DELIVERY AT GOLD COAST UNIVERSITY HOSPITAL

Elizabeth Wake

Elizabeth Wake, BSc (Hons), MN, Trauma Research Coordinator, Gold Coast University Hospital.

Kate Dale, Nurse Practitioner, Trauma Service Program Manager, Gold Coast University Hospital

James Winearls, BSc (Hons), MBBS, MRCP, FCICM, Consultant Intensivist, Gold Coast University Hospital.

Don Campbell, MBBS, FACEM, Consultant Emergency Medicine/Deputy Director Trauma, Gold Coast University Hospital.

A/Prof Martin Wullschleger, MBBS, MD, PhD, FRACS, Director of Trauma, Gold Coast University Hospital

The Trauma Service commenced in February 2014 and now case manages over 100 multi-trauma patients each month, with approximately 30% being major trauma (ISS>12). Case Management improves the efficacy and quality of patient care (Curtis and Leonard 2012).

Trauma Care innovations at GCUH include:

- Implementation of the Red Blanket Protocol for patients with severe haemorrhage who require immediate surgical intervention, with 19 activations since its introduction in February 2015.
- Introduction of ROTEM® which changed how both ED and ICU clinicians administer allogenic blood products to bleeding patients, including 22 instances of Fibrinogen Concentrate administration; ROTEM® is now included in the Massive Transfusion Protocol for all GCUH patients.
- Variation to trauma alert activation, which led to an 85% increase in attendance rates by specialities to ED and consequently to improved patient outcomes (Christensen et al 2011).
- Dedicated Trauma Beds for multi-trauma patients and trauma patients being discharged from ICU/HDU. This has improved interdisciplinary case coordination with clinical and resource efficiency, length of stay management and early discharge and rehabilitation planning. The ward is located on the same level as ICU/HDU providing a major trauma hub for improved patient flow and coordination.
- Development and implementation of the Telecover project (due to commence April 2016) to facilitate earlier discharge and rehabilitation for patients with TBI in Northern NSW via a tele-health platform.

In addition, the health workforce has increased with the appointment of a trauma director, trauma registrars and engagement in dedicated allied health personnel such as a physiotherapist and occupational therapist.



**FEISTY - Fibrinogen Early In Severe Trauma study****Fibrinogen Concentrate vs. Cryoprecipitate in Severe Traumatic Haemorrhage: A Pilot RCT****Authors:**

Dr James Winearls, Consultant Intensivist, Gold Coast University Hospital.  
A/Prof Martin Wulschleger, Director of Trauma, Gold Coast University Hospital  
Elizabeth Wake, Trauma Research Coordinator, Gold Coast University Hospital.  
Dr Catherine Hurn, Consultant Emergency Medicine, Royal Brisbane and Women's Hospital.  
A/Prof Jeremy Furyk, Director Emergency Medicine Research, Townsville Hospital.  
Dr Glen Ryan, Consultant Emergency Medicine, Princess Alexandra Hospital.  
A/Prof Gerben Keijzers, Consultant Emergency Medicine, Gold Coast University Hospital.  
Dr Wayne Dyer, Senior Research Fellow, Australian Red Cross Blood Service.  
Prof Jeffrey Presneill, MBiostat, Consultant Intensivist, Royal Brisbane and Women's Hospital.  
Prof John Fraser, Intensivist/Director Critical Care Research, Prince Charles Hospital  
Dr Don Campbell, Consultant Emergency Medicine/Deputy Director Trauma, Gold Coast University Hospital.

**Introduction:** Trauma is a leading cause of death worldwide and represents a major global health concern. Major haemorrhage in the setting of severe trauma is associated with significant morbidity and mortality. Hypofibrinogenaemia plays a significant role in traumatic haemorrhage and is associated with worse outcomes. It is postulated that early fibrinogen replacement may reduce haemorrhage and improve outcomes. This study will assess the clinical and laboratory effects of a targeted dose of Fibrinogen Concentrate (FC) vs. standard of care (Cryoprecipitate) in traumatic haemorrhage.

**Hypothesis:** Fibrinogen replacement in traumatic haemorrhage can be achieved quicker with a more predictable dose response using FC compared to Cryoprecipitate.

**Primary Study Aims:**

1. Investigate the feasibility of early fibrinogen replacement in traumatic haemorrhage
2. Compare time to administration of fibrinogen replacement between FC and Cryoprecipitate
3. Investigate effects of fibrinogen replacement on fibrinogen levels during haemorrhage
4. Investigate the feasibility of implementing study protocol in a pilot multicentre study

**Design:** Multi-centre, randomised controlled, un-blinded, feasibility pilot study

**Primary Outcome Measures:**

1. Time to administration of Fibrinogen Replacement
2. Feasibility of administering FC within 30 mins
3. Effects on Fibrinogen levels during traumatic haemorrhage

**Secondary Outcome Measures:**

1. Transfusion requirements
2. Duration of bleeding episode
3. ICU and Hospital LOS
4. Duration of Mechanical Ventilation
5. Adverse Events

**Inclusion:**

1. Adult affected by Trauma
2. Judged to have significant haemorrhage
3. Predicted to require significant transfusion with ABC score  $\geq 2$  or by treating clinician judgement

**Intervention:** 100 patients randomised into FC (Intervention) or Cryoprecipitate (Comparator) arms

Requirement for fibrinogen replacement triggered by pre-specified ROTEM values

**Summary:** This study will add to the evidence base and inform the planning a definitive multi-centre study with patient centred outcomes as primary endpoints.

## **TIME TO HAEMORRHAGE CONTROL IN UNSTABLE TRAUMA PATIENTS: A SURVIVAL ANALYSIS**

**Fadie Aziz**

Fadie Aziz (UNSW medical student, Liverpool Hospital)

Dr Scott D'Amours (Liverpool Hospital)

**Objective:** To determine the relationship between survival and the in-hospital time taken to receive definitive haemorrhage control in unstable trauma patients.

**Methods:** An analysis was performed on retrospective data obtained from the South Western Sydney Regional Trauma registry. Inclusion criteria included the following: haemodynamically unstable trauma patients (defined by systolic blood pressure <100 mm Hg amongst other markers) that underwent a haemorrhage control procedure at Liverpool Hospital. Risk ratios for time intervals and binary logistic regression were used to determine the independent mortality risk for delay to haemorrhage control procedure.

**Results:** Relative risk for mortality increased within the first 90 minutes of admission. Logistic regression produced a statistically significant odds ratio for mortality of 1.037 (95% CI 1.010- 1.064; p = 0.006) per minute. This equates to 2.068 (95% CI 1.220-3.45) per 20 minutes indicating that the probability of mortality doubles for every 20 minutes passed.

**Conclusion:** Time to haemorrhage control procedure is an important factor in unstable trauma patients, with risk of mortality doubling for every in-hospital 20-minute delay.

## **ANZ HIP FRACTURE REGISTRY**

**Ian Harris**

### **THE AUSTRALIAN AND NEW ZEALAND HIP FRACTURE REGISTRY**

Professor Ian Harris

The Australian and New Zealand Hip Fracture Registry (ANZHFR) was created in 2012 and has developed since then into a registry that covers approximately 30-40% of all hospitals treating hip fractures in Australia and New Zealand. The ANZHFR has produced annual facility level audits since 2012, has published NHMRC guidelines on the management of patients with hip fractures, and in collaboration with the Australian Commission on Safety and Quality in Health Care and the NZ counterpart, they have produced Clinical Quality Indicators, due for release in August 2016. The first annual patient-level report will be released with the new indicators.

The origins and history of the ANZHFR will be provided, along with current output and lessons learned along the way in establishing a national clinical quality registry.

## **BRINGING PARTY TO LIVERPOOL**

**Nevenka Francis**

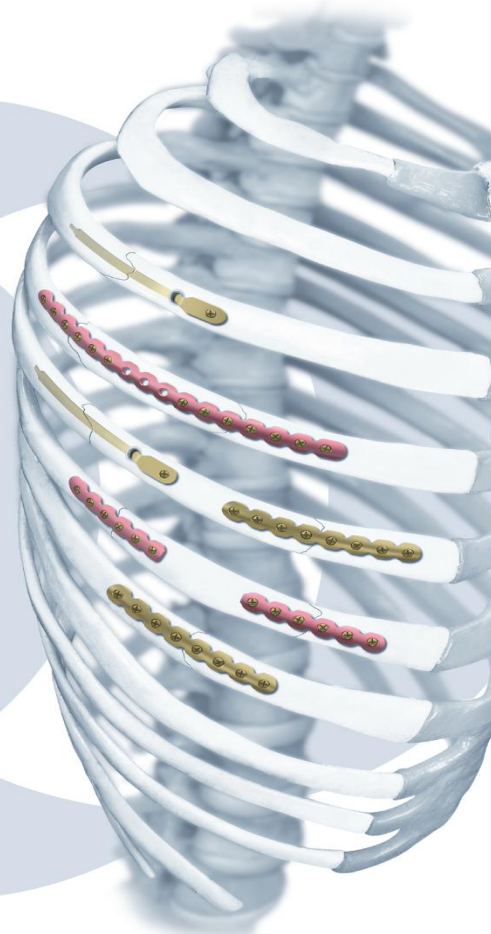
Trauma is responsible for 40% of deaths in the 15 – 24 years age group. Young people are grossly over represented in injury data, both in terms of death and long term disability. This not only impacts the patient but also immediate family, friends, and the community. The costs of immediate care, potential rehabilitation and long term disability support are very high. There is often a significant burden placed on the health care system and productive years of life lost to injury and disability are high. A twelve month analysis of the cost of road trauma injuries admitted to Liverpool was calculated to be greater than\$ 4.5 million. Young people are less able to assess risk, will naturally try to test their limits, overestimate their abilities, have high levels of risk and attention seeking behaviour and are influenced by their peers. South western Sydney is characterised by considerable diversity including; including a relatively young profile compared to the NSW population as a whole with the median age of 35 years compared to 41 years for NSW with a greater proportion of people aged under 15 years than any Sydney region. In 2011 129,120 people were aged 15 - 24 years (21.5% of the population compared to 19% for NSW). This is why the Trauma department chose to bring the P.A.R.T.Y (Prevent Alcohol and Risk Related Trauma in Youth) to Liverpool. The programme engages young people through vivid reality so they can recognise risk and make informed choices about activities and behaviours. We want to be supportive of our young people and have them be independent and make informed decisions so that they do not become a statistic.

Surgical rib fixation for significantly displaced rib fractures and flail chests is becoming more accepted practice. Current literature clearly shows that in a carefully selected group of patients rib fixation is associated with reduction in pain, intensive care length of stays, ventilator time and costs. At Liverpool Hospital we are looking at developing clear guidelines for the surgical management of rib fractures. In this pilot study, we present four patients recently treated at our major trauma centre in Sydney. We are looking at starting a multicentre study examining selection criteria for rib fracture fixation, costs and outcomes.



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# Scientific Program Abstracts

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## DIFFICULT VASCULAR ACCESS IN THE EMERGENCY ROOM

Anders Holtan

Vascular access can be essential in order to get control over the ABC, and a simple and practical strategy is needed. The ATLS rule of 2 large-bore needles is still the standard<sup>1</sup>, and further lines are mostly not needed. If vascular access cannot be achieved and the main problem is A or B, the access is needed for drug administration. Here any small access can be used. The quickest route with highest success rate is mostly intraosseous, as suggested for CPR by the ERC<sup>2</sup>.

In hemorrhagic shock and need for large volume resuscitation, Hagen-Poiseuille law is essential: short and thick. Many products are available, and central venous access is the mostly used. The debate whether ultrasound should be used must be institution specific, and based on access to ultrasound and training. The jugular vein access has the greatest support for use of ultrasound.

Other techniques, e.g. Seldinger technique in order to get large-bore peripheral catheters are elegant but require small access to start with. Devices for making veins visible are available, and ultrasound can be used, however this is frequently not used in the emergency room. Intraosseous is a highly variable and mostly poor flow route for adults, and this is only a quick emergency start up access to use while better access is achieved. Positive pressure should be used<sup>3</sup>. Cut down is an invasive and time consuming access less frequently used than before<sup>4</sup>.

1. Advanced trauma life support (ATLS®):Ninth edition. ATLS Subcommittee; American College of Surgeons' Committee on Trauma; International ATLS working group.
2. A Randomized Cadaver Study Comparing First-Attempt Success Between Tibial and Humeral Intraosseous Insertions Using NIO Device by Paramedics: A Preliminary Investigation. Szarpak L et al. Medicine (Baltimore). 2016 May;95(20)
3. Comparison of the Fluid Resuscitation Rate with and without External Pressure using Two Intraosseous Infusion Systems for Adult Emergencies, the CITRIN (Comparison of Intraosseous infusion systems in emergency medicine)-Study. Hammer N et al . PLoS one. 2015 Dec 2;10(12).
4. Peripheral venous cutdown. Chappell S et al.J Emerg Med.2006 Nov;31(4):411-6.

## ROUTINE SPINAL PRECAUTIONS – IS IT FOR EVERYONE?

Mark Sheridan



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**References** 1. Boehringer Ingelheim Pty Ltd. PRAXBIND (idarucizumab) Approved Product Information. Praxbind® and Pradaxa® are registered trademarks of Boehringer Ingelheim Pty Limited, ABN 52 000 452 308, 78 Waterloo Road, North Ryde NSW 2113. AUS/PRA-161401. July 2016.





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## THE IMPORTANCE OF DEBRIEFING

Joanne Banfield

With increasing evidence to support the role of debriefing, more trauma programs are beginning to integrate structured debriefings into their trauma training programs. The main purpose of debriefing is to investigate the circumstances of the event and allow team members to reflect on performance and discuss areas for improvement. Additionally from a preventative perspective debriefing provides an enhancement for mental coping, minimizes the chances for members returning home distressed or full of self-doubt, and helps in screening individuals in need of further professional intervention for stress reactions and PTSD. This presentation will address four key questions: *Why do it, who should do it, how to do it and why isn't everyone doing it?*

Being involved in a trauma response team ought to be a rewarding experience for all team members. It is our responsibility to take care of ourselves at least as well as we try to take care of others.

1. **Psychological guidelines for a medical team debriefing after a stressful event.**  
Knobler HY<sup>1</sup>, Nachshoni T, Jaffe E, Peretz G, Yehuda YB
2. **Acceptability and implementation of debriefings after trauma resuscitation.**  
Berg GM<sup>1</sup>, Hervey AM, Basham-Saif A, Parsons D, Acuna DL, Lippoldt D.
3. **Debriefing the Trauma Team: Taking Care of Your Own** Dennis Potter, M.S.W., B.C.S.C.R

## PANCREATICODUODENAL INJURIES – BEST APPROACH

Maria Fernanda Jimenez

Pancreatic duodenal trauma is uncommon resulting in lack of significant management experience, with devastating consequences, when missed. This is a challenging situation due to the complex anatomy, presence of multiple injuries, and the lack of standardized and reliable method of repair. Recommendations are based primarily on observational studies and expert opinion.

CT scan or exploratory laparotomy generally recognizes pancreatic and duodenal injuries. Plan of repair depends on: severity of the injury, hemodynamic state, degree of contamination, and presence of sepsis.

Indications for Non Operative Management of pancreatic injury are: patients with no indication of laparotomy, pancreatic injuries Grade II and I, no clinical or CT scan suggestion of possible duct injury. Therefore, main duct injury must be excluded early in patients with clinical or CT suspicion with MRCP or ERCP

Algorithms of treatment provide a safe and sensible approach that could be used at most trauma centres worldwide. Application of damage control techniques for pancreatic duodenal injuries leads to improvement of survival and acceptable incidence of complications. The Less is Better approach is recommended in complex pancreatic and duodenal injuries .

Malhotra A, Biffl WL, Moore EE, Schreiber M, Albrecht RA, Cohen M, Croce M, Karmy-Jones R, Namias N, Rowell S, Shatz DV, Brasel KJ. Western Trauma Association Critical Decisions in Trauma: Diagnosis and management of duodenal injuries. J Trauma Acute Care Surg. 2015 Dec;79(6):1096-101

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Patients with severe pelvic injuries carry a high risk of complications and death, hemorrhage being the most frequent cause of mortality during the first 24 hours. In the last two decades, two procedures for in-hospital hemostatic control are dominating the existing literature; angiographic embolization (AE) and extraperitoneal pelvic packing (EPP). Angiography of patients presenting with hemodynamic instability related to pelvic fractures, has been found positive for arterial bleeding in the majority of patients. AE has been reported effective with a low complication profile and traditionally advocated as a front-line therapeutic intervention for hemostasis. However, the procedure is time consuming and not available 24/7 in all institutions taking care of severely injured patients.

EPP was introduced at Oslo University Hospital Ulleval two decades ago and has since been part of a formal treatment protocol for severe pelvic injuries which also includes fracture reduction and initial non-invasive pelvic binder and AE [1]. Published studies from other institutions have advocated EPP as a first-line therapy in-lieu of angiography. However, EPP is invasive with a high risk of complications and should be performed only when initial resuscitation fails to stabilize the patient for AE.

In line with international trends, our institutional resuscitation strategies have changed towards damage control resuscitation principles including better multidisciplinary approach and with an updated massive hemorrhage protocol from January 2007. To clarify whether these changes have influenced treatment and outcome in patients with severe pelvic injuries, we retrospectively evaluated trends in management between 2002-2006 and 2007-2012. We found that EPP and angiography rates for exsanguinating pelvic injuries have decreased with improved resuscitation strategies, reducing red blood cells requirements and hemorrhage related deaths. However, EPP still has a role as a lifesaving procedure in exsanguinating pelvic injuries not responding to resuscitation and in situations where angiography is not available [2].

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## **MANGLED EXTREMITIES – BEST APPROACH**

**Martin Wullschleger**

Mangled extremities are rare injuries, but seriously challenge the clinicians in terms of decision-making and management. From the literature, approximately 20% of mangled limbs result in amputation, half of them in the early phase<sup>1</sup>. Apart from limb injury characteristics (soft tissue damage/loss, vascular and nerve damage), other factors such as severe head injury, shock in the emergency room and high-energy mechanism are associated with early amputation<sup>1</sup>. The mangled extremity severity score (MESS) and other scoring systems have been used and indicate some prognostic value, but particularly in upper limb injuries as well as in the combat situation its threshold score and clinical application is debatable<sup>2,3</sup>.

This presentation will concentrate on the initial assessment, clinical decision-making and management during the early resuscitative phase of patients with mangled extremity injuries. Challenges, including entrapped mangled limb situations, haemorrhage control, life-before-limb circumstances and risk for reperfusion syndrome, will also be discussed.

In conclusion, experience and senior clinician input is crucial in the decision-making and management of these limb, and potentially life-threatening injuries.

Literature:

<sup>1</sup> de Mestral C et al., A contemporary analysis of the management of the mangled lower extremity, *J Trauma Acute Care Surg*, 2013.

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Emergency room thoracotomy (ERT) is a life-saving intervention in trauma patients in an imminent or a recent cardiac arrest. Predominantly, ERT is reserved to patients with penetrating chest injuries with short prehospital times and recent loss of vital signs. The American College of Surgeons have established guidelines for the practice both for adults and children (1). Nevertheless, varying practices prevail in various regions of the world. The ERT requires appropriate training, surgical equipment, and common effort between surgical, anaesthesia and ED providers in the ER setting and in OR. In ER, a well-established protocol must be followed with immediate airway management, establishment of intravenous access with large bore peripheral lines and/or a CVC sheath. The patient is placed on an ER gurney with left chest slightly elevated on a bump. This position provides optimal view into the mediastinum during the procedure. A simple tray of ERT instruments must be available with polypropylene 2-0 and 3-0, non-cutting sutures. The incision is performed in the left 5<sup>th</sup> intercostal space to access the heart, to achieve haemorrhage control and to provide cardiac resuscitation. Likewise, the left thoracotomy allows aortic cross-clamping to shunt the blood to brain and coronary vessels during the resuscitation. After the skin incision, the intercostal muscles are divided with a scalpel and scissors. Right main-stem bronchial intubation decompresses the left lung that provides easy access to the left chest. The Finochietto retractor facilitates surgical exposure. The left lung is retracted with Duval clamp and the inferior pulmonary ligament is divided making sure not to injure the inferior pulmonary vein. The pericardial sac is opened anterior to the phrenic nerve and the heart is delivered to the left chest for haemorrhage control, repair, and resuscitation. Placement of a right chest tube is performed simultaneous to thoracotomy. If the chest tube output signals a major haemorrhage in the right chest, the thoracotomy is extended across the sternum to a clam-shell thoracotomy for a wide exposure and haemorrhage control in bilateral chest cavities and mediastinum. In selected cases, the aortic cross-clamp is placed just proximal to the diaphragmatic dome (2). Intravenous and/or intra-cardiac pharmacological resuscitation by epinephrine, atropine, bicarbonate and calcium solutions is utilized in some settings. In ventricular fibrillation, the direct cardiac defibrillation is applied with 30 J. In a failing myocardial activity, epicardial pacing can be utilized in very selected cases. The survival following ERT is 8.8% and 1.4% in penetrating and blunt injuries, respectively, with a full neurological recovery in 94% of cases (3).

**References:**

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3. Rhee P, Acosta J, Bridgeman A, et al. Survival After Emergency Department Thoracotomy: Review of Published Data from the Past 25 Years. *J Am Coll Surg.* 2000, 190 (3).

**SPLENIC PRESERVATION****Tina Gaarder**

The vast majority of blunt splenic injuries are currently managed nonoperatively, with the primary indication for operative management being haemodynamic compromise due to ongoing bleeding. As most splenic injuries requiring surgery are high grade injuries, splenectomy is likely the safest and least time-consuming choice. With increasing nonoperative management (NOM), few splenic injuries lend themselves to intra-operative splenic salvage like splenorrhaphy, performed previously in today's typical NOM patient.

The role of interventional radiology in the form of splenic arterial embolization (SAE) has evolved over the last 2 decades as an important adjunct to (NOM). Risk factors for failure of NOM include high grade injuries, large haemoperitoneum, contrast extravasation and age, but none of these represent absolute contraindications. Protocols still vary and should be tailored to the local hospital resource context, but widely accepted indications for SAE are pseudoaneurysms and contrast extravasation on CT scan in haemodynamically normal or normalized patients. Additionally, more and more institutions have implemented preemptive SAE for OIS (Organ Injury Scale) grade IV and V haemodynamically normal patients, with high success rates. However, there is still a call for a randomized controlled trial (RCT) to confirm the safety of SAE in high grade splenic injuries, and such a multicentre international trial is planned with 13 participating trauma centres.

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## PLENARY SESSION – MARIA SEGER KEYNOTE ADDRESS

### Injury Prevention – Are We Doing Enough?

Joanne Banfield

Intentional and unintentional injuries continue to be a threat to health in every country of the world. Between them, they account for 9% of global mortality - more than five million deaths every year. Despite growing awareness of the magnitude of the problem, attention to injury prevention among policy-makers and those funding global public health programming remains disproportionately low. Deaths from many communicable diseases are declining more rapidly than injury related deaths. This is particularly alarming given that injuries can be prevented. There is a broad range of strategies based on sound scientific evidence that have been shown to be effective and cost-effective at reducing injuries, and these strategies need to be more widely implemented.

In recent decades the most significant declines in injuries have been seen mainly in high-income countries, which have reduced the burden of injury considerably by applying proven prevention and treatment strategies.

However, despite the fact that progress has been made, our continued focus must be on improving surveillance; developing science-based approaches to prevention, control and rehabilitation; disseminating proven and promising interventions; developing strong social policy; addressing the social determinants of health and injury; enhancing teaching and training programs that includes knowledge translation; creating multidisciplinary policies and action plans and increasing investments in injury prevention.

Effective injury prevention means making positive choices to minimize risk at all levels of society while maintaining healthy, active and safe communities and lifestyles. We know that some populations are at higher risk for injury than others such as Aboriginals, young males, seniors, lower-socioeconomic status, and young children. As frontline practitioners we need to understand the risk that certain populations face and advocate for changes in our communities to reduce the burden of injury on our healthcare system. We need to change the conversation and become part of the solution.

This presentation will address what **we**, as medical professionals, must do as our part of the solution, keeping in mind that while no one group can solve the injury problem we are a part of it.

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3. WHO (2014). Injuries and violence: The facts

## DEBATE - PREHOSPITAL THORACOTOMY IS A PREHOSPITAL AUTOPSY

### PREHOSPITAL THORACOTOMY IS A PREHOSPITAL AUTOPSY – SURGEON Tina Gaarder

Resuscitative thoracotomy can be performed as an anterolateral thoracotomy or extended into a bilateral thoracotomy, also called a clamshell thoracotomy. A clamshell thoracotomy is a major surgical access procedure performed in trauma patients in extremis or in cardiac arrest, with the aim to relieve cardiac tamponade, control major thoracic bleeding, or to get control of the aorta in case of intraabdominal bleeding.

Performing a clamshell thoracotomy is in itself associated with challenges and complications, even in the hands of skilled surgeons, and requires programs for systematic and repeated training. Dealing with the potential bleeding sources, be it traumatic or iatrogenic after having performed a clamshell thoracotomy, poses challenges to even the best trained multidisciplinary in-hospital trauma teams.

Clamshell thoracotomy has been advocated as a prehospital procedure in some publications, mostly from highly urban areas, but its wider applicability and implications of its implementation in other settings should be debated.

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### PREHOSPITAL THORACOTOMY IS A PREHOSPITAL AUTOPSY - ER PHYSICIAN Brian Burns

## ARE LOW VOLUME AND HIGH PERFORMANCE COMPATIBLE?

Kate Martin

The debate regarding optimal trauma case load has continued since the development of trauma as a specialty. Intuitively it makes sense to assume there is a minimum number of patients that are required to be treated for a hospital to maintain a minimum standard. While some studies have shown a correlation between high volume and low mortality, it is unclear if these are applicable to our local environment. Retrospective analysis has shown that trauma systems with integrated pre-hospital, hospital and rehabilitation services, delivered by personnel trained to deliver a specific component of the trauma care improve not only mortality, but other measurable outcomes after trauma, such as disability and quality of life. In a country where it is not possible to have every patient within 80 minutes of a high volume trauma service, high performance is achieved through other means.

## TEG AND ROTEM – WHAT'S THE USE

Tina Gaarder

Trauma remains one of the world's leading causes of death with up to half of early in-hospital deaths due to haemorrhage. Advances in our understanding of trauma-induced coagulopathy (TIC) and new resuscitation strategies have led to better outcomes. However, most contemporary resuscitation strategies deliver volume resuscitation through an empiric, balanced transfusion of red blood cells, plasma and platelets in proportions approximating that of whole blood, but are not able to correct TIC during ongoing bleeding.

The PROPPR trial (The Pragmatic, Randomized Optimal Platelet and Plasma Ratios Trial) provides the best evidence to date for a high ratio empiric resuscitation strategy, suggesting better outcomes when aiming for a 1:1:1 ratio of plasma: platelets: red blood cells (RBC) as compared to a 1:1:2 ratio. Current evidence also supports the early administration of Tranexamic Acid (TXA) to bleeding trauma patients in need of massive transfusion.

A targeted, evidence-based medicine approach to the treatment of TIC may lead to improved outcomes while reducing overall transfusion requirements. Traditionally, Over the past decade, the interest in Viscoelastic Haemostatic Assays (VHAs) to guide resuscitation during ongoing bleeding has been increasing. Although increasingly integrated in contemporary guidelines, there is currently insufficient data to support the use of VHAs in trauma haemorrhage. Especially, evidence is lacking for which parameters and which thresholds should be used to guide the administration of procoagulants during active bleeding.

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4. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant haemorrhage (CRASH-2): a randomised, placebo-controlled trial. *The Lancet*. 2010;376(9734):23-32.
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6. Hunt H, Stanworth S, Curry N et al. Thromboelastography (TEG) and rotational thromboelastometry (ROTEM) for traumainduced coagulopathy in adult trauma patients with bleeding (Review). *Cochrane Database Syst Rev* 2015 Feb 16;2:1-52



Minimally invasive techniques, although not widely adopted by trauma surgeons, may have a role in appropriately selected, haemodynamically stable patients. Most useful in penetrating abdominal trauma, laparoscopy can be both diagnostic and therapeutic although meticulous examination of the bowel should be undertaken in order to exclude occult injury. Diaphragmatic injuries can be detected and repaired if skills permit. Other indications may include diagnostic tool in blunt abdominal trauma, defunctioning stomas and very occasionally, management of selected solid organ injuries. Caution must be exercised in the trauma patient and preparation should include setup for conversion to trauma laparotomy if condition deteriorates.

## CATHETER-BASED INTERVENTIONS – HAVE WE GONE TOO FAR? Timothy Williams

Endovascular therapies for trauma are increasingly utilized, with support from multiple major trauma societies. Endovascular management is preferred for certain injury patterns such as blunt thoracic aortic injury and axillosubclavian injury, with improved outcomes demonstrated clinically. For patients with relative hemodynamic stability, endovascular techniques such as catheter-based angioembolization for vascular injury in other distributions is widely endorsed, particularly in anatomic distributions where open surgical access is challenging. However, many of these interventions require some degree of hemodynamic stability in order to allow for mobilization of specialists capable of delivering these therapies, as the providers are unlikely to be in house after hours.

The choice of management option, whether it be open or endovascular, typically dictates the physical location of the patient. This can create “treatment silos”, where certain interventions may be limited or impractical, which can create a conflict for competing treatment goals. A common scenario highlighting this is the decision to take a poly-injured patient to interventional radiology for embolization of an arterial injury, thus limiting definitive surgical capabilities. While it is recognized that bringing the therapy to the patient, as opposed to bringing the patient to the therapy, can minimize delays in treatment and expand capabilities, this type of physical infrastructure (i.e. hybrid operating rooms) is not widely available currently.

For unstable patients with non-compressible torso haemorrhage, endovascular management options such as REBOA are increasingly applied and endorsed by the trauma community. However, open vascular control remains the most common intervention performed.

It is safe to say that the development of endovascular technologies and capabilities has outpaced our ability to widely implement these lifesaving therapies, particularly in the management of unstable patients. There are multiple factors contributing to this current divide. One major limitation is the lack of physical infrastructure within most institutions to deliver simultaneous open and endovascular therapy, in the form of dedicated trauma hybrid operating rooms. Additionally, there is a lack of widespread experience/expertise in basic endovascular skills by front-line providers, namely trauma surgeons and emergency medicine physicians. These factors serve as major obstacles to practical implementation of endovascular therapies, particularly in critically injured unstable patients. Has catheter-based intervention gone too far or has our ability to practically implement these potential life-saving therapies not gone far enough?

**SEVERE HEAD INJURY: WHAT MAKES A DIFFERENCE?****Peep Talving**

Severe head injury is a global health concern. Estimated population-based incidence of traumatic brain injury (TBI) is ranging between 150-300 per 100.000 per year. However, severe traumatic brain injuries (sTBI) constitute only about 3-5% of all TBI cases (1). Nevertheless, the mortality rate in these instances is ranging between 20-50% in spite major advancements in prehospital care, medical imaging, neurosurgical capabilities, and critical care.





The sole effective intervention to reduce neurological injury burden is the primary prevention such as universal helmet utilization and traffic safety that is not universally implemented. Increasing head injury severity is inversely associated with detrimental outcomes. Majority of trauma fatalities occur in the prehospital phase of care. The benefits of prehospital endotracheal intubation in sTBI are not well documented. However, a single episode of hypotension or hypoxia following sTBI detrimentally affects outcomes and should be strictly avoided and aggressively treated. Likewise, early in-hospital care including airway management, diagnosis of the entire injury burden, and resuscitation are strong predictor of outcome in sTBI. Associated bleeding sources require aggressive management to avoid hypotensive episodes that reversely affect sTBI outcomes. Head injury evaluation is performed by trauma surgical and neurosurgical expertise. Intracranial pressure assessment is facilitated by clinical exam, optic nerve sheath ultrasound or an ICP device. ICP-guided management has shown improved outcomes in contemporary investigations (2). Focal mass lesions require early neurosurgical intervention. However, decompressive craniectomy in diffuse severe brain injury decreases ICP, ventilator days, and ICU LOS but impairs Glasgow Outcome Score at 6 months after injury. Critical care with low PEEP pressures, adequate sedation, pain control are modifiable factors in ICP management. Systemic complications such as electrolyte abnormalities, coagulopathy, neurogenic pulmonary oedema, neurogenic cardiomyopathy, diabetes insipidus, and SIADH have been recently elucidated and require management (3). Administration of erythropoiesis stimulating agents, beta-blockers, and amantadine have demonstrated significant outcome benefits in sTBI.

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3. Lim HB, Smith M. Systemic complications after head injury: a clinical review Anaesthesia, 2007

## INNOVATIVE SOLUTIONS FOR CHALLENGING THORACIC PROCEDURES

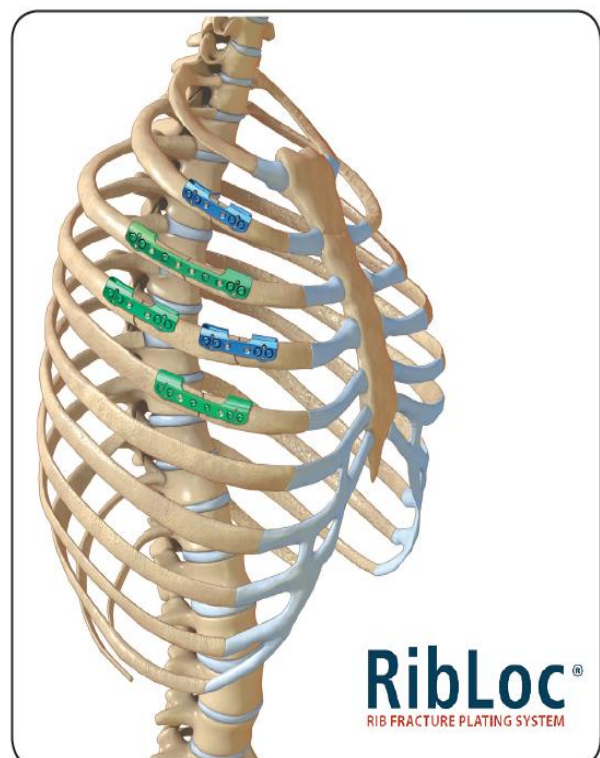
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## DAMAGE CONTROL RESUSCITATION

Patrick Liston

Damage control resuscitation is solidly married to damage control surgery and they cannot work in the modern trauma system without each other. Damage control surgery relies on stopping the bleeding and contamination, correcting the physiology and later returning to the OR for definitive surgery.

Damage control resuscitation aims to limit the physiological derangements of trauma patients by

1. C-ABC resuscitation
2. Permissive hypotension
3. Limited crystalloid, early blood products using 1:1:1 ratios, aided by a massive transfusion protocol and ROTEM
4. Early use of TXA
5. Damage control surgery to stop the bleeding.

DCR must be used in concert with DCS and not delay DCS.

Research has been ongoing to improve DCR and includes

1. Evidence from the British Military that DCR can be brought forward to the point of injury by advanced medical helicopter teams and save lives.
2. In the USA, a society afflicted with gun violence, trauma surgeons are contributing to preventing ballistic trauma thereby decreasing the need for DCR.
3. DCR may involve the use of automated observations coupled with point of care testing and smart monitoring devices with various algorithms that can aid and warn the clinician of the need for massive transfusion activation.
4. Though in a recent systematic review REBOA has not been shown to improve outcome from haemorrhagic shock, it still has potential and we await further robust studies. What we do know is that in pig models the use of REBOA decreases bleeding and improves early survival in penetrating trauma models and that a new type of balloon catheter can be easily deployed without the need for fluoroscopy. The place of REBOA in blunt trauma is not to delay the time to definitive surgical haemostasis but to keep the person alive for that to happen rapidly.
5. Though hypotensive resuscitation is a key factor in DCR we don't know how low we can go and there is no evidence that a MAP of 50 is better than one of 65.

Reviews & guidelines.

Lamb et al BJA 2014 113(2) 242-9

Rossaint et al Critical care 2016 20: 100 (European guidelines)

Ball CJS 2014 57 (1) 55-60

Kaafarani & Velmahos Scand J Surg 2014 0: 1-8

## NEUROSURGERY FOR NON-NEUROSURGEONS

Mark Sheridan

## **WHO NEEDS TO BE TRANSFERRED TO A LEVEL ONE?**

**Pal Aksel Naess**

The development of trauma systems has been shown to be a prerequisite for adequate trauma care but is still lacking in most countries worldwide. Trauma systems are designed to facilitate treatment based on the recognition of the complexity and time-critical nature of potentially severely injured patients. There are many factors associated with the decision to transfer injured patients to a regional trauma center, including transportation time and distances, referral hospitals, patient age and comorbidities. The aim of transfer should be to ensure optimal treatment of severely injured patients. Predefined transfer criteria should be an obligatory part of a regionalized trauma system. The institution of such a system will lead to increases in transfer rates and redistribution of hospitalized trauma patients. Transfer times to definitive care are often prolonged in all but the most severely injured patients [1]. Care at designated trauma centers seems to be associated with improved outcome after severe injury when compared to care at non-trauma centers [2]. However, experience from one healthcare system cannot automatically be converted to another.

1. Svenson J. Trauma system and timing of patient transfer: are we improving? Am J Emerg Med 2008; 26: 465-468.
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## **VASCULAR EMERGENCIES – QUICK FIXES**

**John Crozier**

## **SOLID ORGAN INJURIES WITHOUT ANGIOGRAPHY**

**Maria Fernanda Jimenez**

The liver and the spleen are frequently injured organs due to blunt (45%, 55%) and penetrating trauma (liver up to 40%). For successful treatment of the solid organ injuries, the surgeon must know when to consider Non Operative Management (NOM), and when to explore the patient. Success rate of NOM in high-grade injuries had increased with the use of embolisation.

Clinicians must use their clinical judgment to diagnose hemodynamic instability. and set a threshold for failure of NOM. Blunt hepatic and splenic injuries behave differently and should managed differently. Stable patients with liver injuries can be managed NOM irrespective of the grade of the hepatic injury. Stable patients with splenic grade IV and V injuries, and patients with moderate and severe Traumatic Brain Injury (TBI) are considered indications for operative management.

Trauma laparotomy includes four essential parts: 1. Control of massive haemorrhage (packing) 2. Identification of the injuries 3. Contamination control. 4. Reconstruction if possible. The surgeon must consider damage control procedure, if the patient is hypotensive, hypothermic, coagulopathic, and acidotic. Several techniques had been used to control the solid organ bleeding such as packing, wrapping, use of haemostatic agents and coagulators, omental patch, resectional debridement, balloon tamponade.

Trauma centers leaders need to advocate for 24h availability of angio suites and embolisation increasing organ salvage rates. However, when the decision is to explore the patient, the surgeon must be familiar with the anatomy, the techniques to expose and mobilize the organs, to control the bleeding, to obtain vascular control, and to repair these injuries when possible.

Peitzman AB, Heil B, Rivera L, Federle MB, Harbrecht BG, Clancy KD, Croce M, Enderson BL, Morris JA, Shatz D, Meredith JW, Ochoa JB, Fakhry SM, Cushman JG, Minei JP, McCarthy M, Luchette FA, Townsend R, Tinkoff G, Block EF, Ross S, Frykberg ER, Bell RM, Davis F 3rd, Weireter L, Shapiro MB. Blunt splenic injury in adults: Multi-institutional Study of the Eastern Association for the Surgery of Trauma. J Trauma. 2000 Aug;49(2):177-87; discussion 187-9

Roberts DJ, Ball CG, Feliciano DV, Moore EE, Ivatury RR, Lucas CE, Fabian TC, Zygun DA, Kirkpatrick AW, Stelfox HT. History of the Innovation of Damage Control for Management of Trauma Patients: 1902-2016. Ann Surg. 2016 Jun 17

## **ORTHOPAEDIC TRAUMA LIMITATIONS**

**Kerin Fielding**

This presentation will highlight some of the limitations of working as a Rural Orthopaedic Surgeon in a Rural/Regional centre where there are specific problems related to the lack of Super Specialists and significant time delays in patient presentation. Case reviews from the surgeons on-call weeks will be used to illustrate these specific Rural issues.



**Paediatric Trauma in the Pre-Hospital Environment****Bernie Hanrahan**

Trauma is the leading cause of paediatric mortality world wide. CNS injury is a major contributor to this mortality. Early pre-hospital intervention to prevent secondary may reduce morbidity and mortality. CareFlight is a rapid response trauma service covering the Sydney basin. Patterns of injury, interventions and management challenges are discussed for 349 patients under the age of 16 attended for the 5 year period from 2007 to 2012.

Falls (33%) MVA (30%) Sport 14% and Immersion 12% were the bulk of these injuries. MVA and Immersion were most likely to produce serious injury as compared to falls. 22% were intubated. 15% received analgesia. 97 % were taken direct to a Paediatric Trauma Centre.

Intubating children on scene is associated with a high rate of failure and should be undertaken by experienced prehospital teams. Paediatric prehospital patients have a high rate of serious injury and dependency often requiring urgent critical care interventions. Prehospital clinicians should have paediatric training and maintain skills in intubation, venous access and analgesia.

**References**

1. [Eur J Emerg Med](#). 2014 Apr;21(2):130-5. doi: 10.1097/MEJ.0b013e328362dffa.

**Prehospital paediatric emergencies treated by an Australian helicopter emergency medical service.**  
[Barker CL](#)<sup>1</sup>, [Weatherall AD](#).

## **FRAGILE ELDERLY BONES**

**Kerin Fielding**

This presentation will include case discussions of patients with significant or severe Osteoporosis who have presented to a large Rural/Regional Centre for treatment. Osteoporosis is a significant problem in Rural patients who are often untreated for many years and therefore present with complex fractures and injury patterns. Treatment of these cases can be very difficult in the Rural/Regional settings where there are no super specialists. The patients are often public patients who are not keen to travel to the city for treatment nor can they or their family afford this.

## **EXTREMES OF AGE: OPERATING ROOM**

**Peep Talving**

### **Elderly**

Timely access to operating room and hemorrhage control is of paramount importance in elderly. Appropriate vs. futile care assessment must precede the treatment plan dependent on advanced care directives, injury burden, and outcome perspective. Operating room preparation is provided with warming devices, surgical equipment and OR staff. Vascular access is obtained with peripheral lines and/or a large-bore IV sheath in subclavian, internal jugular or occasionally in common femoral vein. Operating room management requires basic laparotomy, vascular, and thoracotomy trays as necessary. Adequate exposure with Omni-flex™ or Bookwalter retractor systems are helpful for adequate exposure. Vessel-loops, local hemostatic agents, clips, vascular shunts should be available. Damage control (DC) is a strategy of choice in elderly due to their limited capability to respond to injury and hemorrhage (1). Elderly are frequently on anticoagulation requiring immediate reversal of coumadin, factor Xa-inhibitors, or antiplatelet drugs. Thus, PRBC, fresh frozen plasma, platelets for massive transfusion and idarucizumab (Praxbind), prothrombin complex concentrate are crucial to reverse coagulopathy. Point-of-care TEG/ROTEM in OR facilitates blood component resuscitation.

Surgical neck injuries are managed with full C-spine protection in associated blunt head/neck trauma. Cardiac injuries are accessed best through a median sternotomy. Thoracotomy is used to access the chest wall, posterior mediastinum, pulmonary and hilar structures but is associated with rib fractures leading to pain and pneumonia in elderly. A need for extension to clamshell thoracotomy signals extremely poor prognosis. Abdominal lesions are explored through midline laparotomy in abbreviated fashion and pace. Solid organ injuries are less amenable for NOM in elderly and a splenic injury usually mandates a splenectomy. Vascular injuries are preferentially shunted and definitive repair provided primarily in stable patients or at a later stage. Elderly trauma victims require admission to critical care unit with appropriate capabilities.

### **Children**

Pediatric trauma operating room requires pediatric surgical drapes, appropriate tray with vascular and sternotomy/thoracotomy additions. Warming devices is utilized universally. Pediatric anesthesia team is a major resource for airway management, vascular access, and resuscitation. Pediatric mediastinum/chest are pliable and risk for tension physiology is high when pneumo- or hemothorax is present and mechanical ventilation is induced. In hemodynamic compromise after chest trauma, immediate bilateral chest tube placement may be appropriate. Readily available PRBC, FFP, and platelets must be available. Massive transfusion protocol in a 1:1:1 ratio is applied in anticipated massive hemorrhage or blood loss exceeding 40ml/kg/12 hrs (2). Strategy of

definitive care vs. damage control is applied depending on the injury severity, core temperature and coagulopathy. Injuries to the neck are accessed through standardized neck incision. Decompression of pericardial tamponade and cardiac repair is performed through a midline sternotomy. Likewise, access to the great vessels in the upper mediastinum is obtained through midline sternotomy. Thoracotomy incision is used to address injuries in the chest wall, lung, pulmonary hilum or posterior mediastinum. Bilateral exposure of the chest cavities is established through a clamshell incision. Abdominal injuries are accessed through midline laparotomy that allows extension to sternotomy if necessary. Pediatric abdomen is wider than it is “long” and thus many trauma surgeons use transverse supraumbilical incision allows excellent access to all four quadrants in children <5 years of age. (3) Pediatric vascular injuries may require vascular surgery expertise. Primary end-organ or limb perfusion is established using temporary vascular shunts in OR followed by definitive care. Dedicated pediatric ICU provides post-operative care in these instances.

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## **PITFALLS IN PAEDIATRIC RESUSCITATION**

**Brian Burns**

## NOTES

## NOTES

# **25<sup>TH</sup>**

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