

# SWAN 2017

## TRAUMA CONFERENCE

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EMERGENCY SURGERY

28 – 29 JULY 2017

*25th Anniversary*



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THE PARK  
SYDNEY AUSTRALIA

# SWAN 25 TRAUMA CONFERENCE

28-29 JULY 2017

It is with immense pleasure that we welcome you to SWAN 2017 which, for the first time, is being held in the Sydney CBD at the beautiful Sheraton On The Park. We are celebrating our 25th Anniversary which makes us Australia's longest running Trauma Conference and now its most successful.

To celebrate our 25th Anniversary we have a stellar line up of speakers, headed by Professor Michael Sugrue from Ireland, the Founder of SWAN and previous long-term Director of Trauma at Liverpool Hospital. Joining him is a world renowned international faculty from the USA, Canada, Thailand, The Netherlands and New Zealand as well as our own national experts in trauma care.

Also in celebration of our anniversary and our move to the city, we have expanded the program to include Critical Care and Emergency Surgery which brings us in line with the global move towards Acute Care Surgery as a separate and well defined specialty. This conference promises to be outstanding with a great mix of lectures, debates, interactive case scenarios, key note speeches and Q and A sessions.

This year we will hear 'Stories from' various remote, dangerous, different and exciting places and situations. We will have a broad range of topics presented in a program that focuses on difficult operative scenarios, critical decision making, controversial issues and strategies on how to find your way out of nightmare clinical situations.

We hope you thoroughly enjoy SWAN 2017, Australia's leading Trauma, Critical Care and Emergency Surgery Conference. This will be a superb two days of education, entertainment, inspiration and innovation.



**Dr Scott D'Amours**  
**Conference Convenor**



**Dr Valerie Malka**  
**Conference Convenor**

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## Sponsor Acknowledgement

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## General Information

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**WIFI Access:** Guests will have to log in to Sheraton Conference and will be asked for the password. WIFI Password **SWAN2017**

**SWAN 25 Feedback** - go to link emailed to you preconference

**Questions and Comments** - We want to make sure we address your most important questions and concerns at today's event. There will be microphones setup and we encourage you to stand up and engage with the speakers and other attendees by asking questions. Additionally, we'll be using a simple tool called Slido that allows you to easily submit your questions and express your opinion electronically.

1. Please take out your smart phones and connect to the wifi
2. Open the web browser
3. Go to [www.slido.com](http://www.slido.com) and enter the event code **#2911**

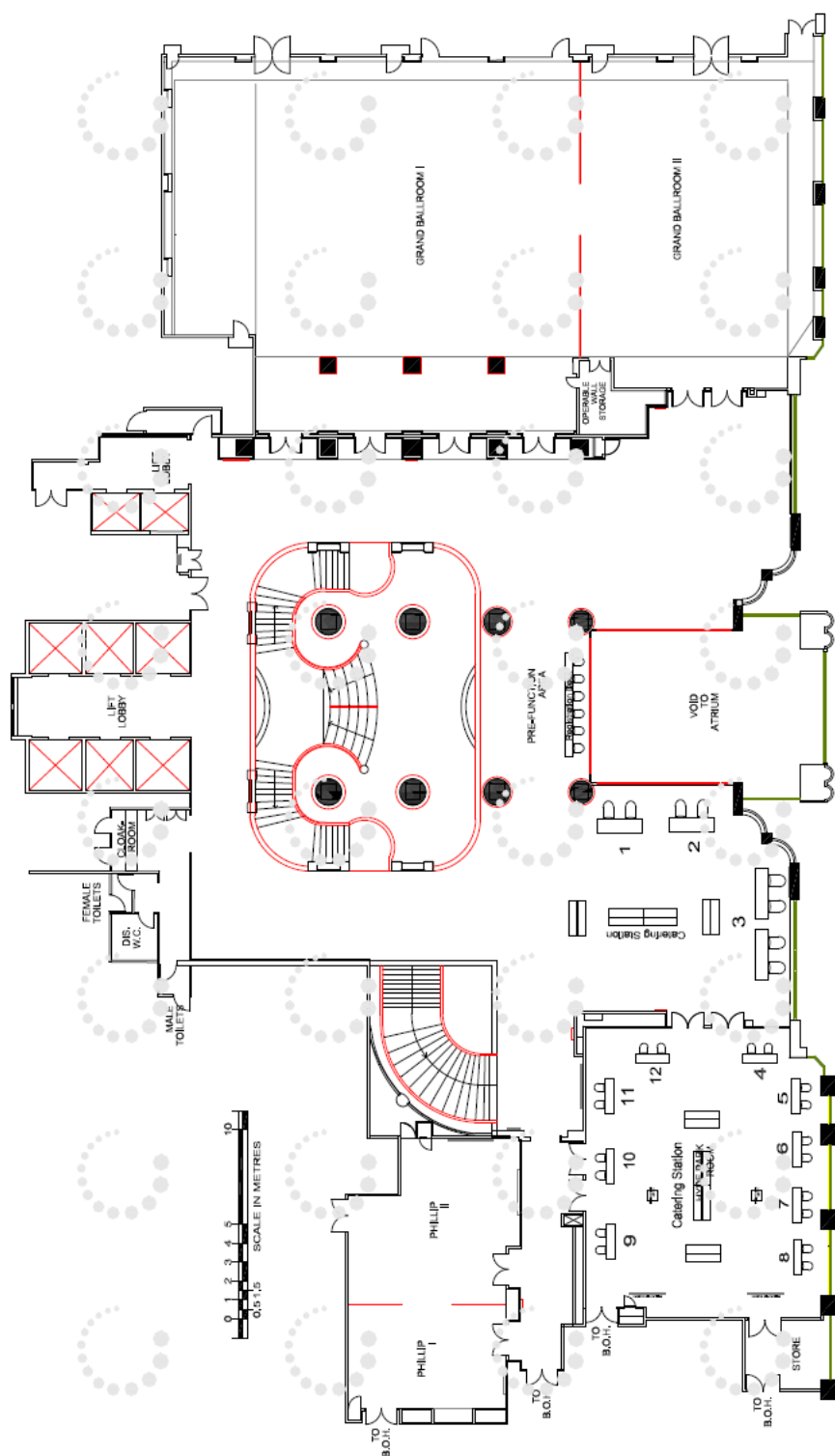


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## Grand Ballroom and Industry Exhibition Floor Plan



- |                             |                    |
|-----------------------------|--------------------|
| 1. Defence Force Recruiting | 7. DePuy Synthes   |
| 2. Acelity                  | 8. OPC Health      |
| 3. University of Newcastle  | 9. Medtronic       |
| 4. Baxter                   | 10. Smith & Nephew |
| 5. Advanced Biomedical      | 11. Haemonetics    |
| 6. Sanofi                   | 12. Medigroup      |



## General Information

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**Venue** – Sheraton On The Park Hotel 161 Elizabeth Street, Sydney Grand Ballroom, Level 2.

**Car Parking** – Parking available at Sheraton on the Park Hotel. 161 Elizabeth Street, Sydney. Valet Parking @ \$65.00 per day and self parking @ \$55.00 per day. In addition the Domain Car Park is available with entry via St Mary's Road Sydney. Information regarding rates can be found at [domaincarpark.com.au/rates-a-times](http://domaincarpark.com.au/rates-a-times).

**Conference Catering** - Morning/ afternoon teas as well as lunches will be served in the Hyde Park room located on level 2 and in the foyer space next to the Hyde Park room.

**Industry Exhibition** - Sponsor exhibits are located in the Hyde Park room and the foyer area just outside the Hyde Park room. Please make sure you complete your exhibition passport in order to be eligible for a prize.

**Registration Desk** - Desk will be located in the pre function area outside the grand ballroom. Name badges and satchels must be collected prior to entry to the conference.

**Scientific Program** – Plenary sessions will be run in the Grand Ballroom. The Grand Ballroom will be split into Ballroom 1 and 2 for the concurrent sessions.

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## BECOME A TRAUMA LEADER

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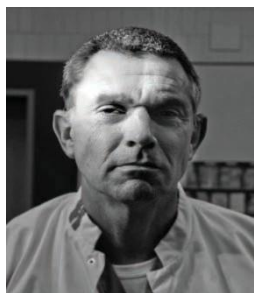
**3 new streams in 2018: Surgery, Orthopaedics and Applied Research**  
(pending University approval)

For more information on the Master of Traumatology program, to enquire or apply, visit [gradschool.edu.au/traumatology](http://gradschool.edu.au/traumatology) or contact **Dr. Natalie Enninghorst** at [natalie.enninghorst@newcastle.edu.au](mailto:natalie.enninghorst@newcastle.edu.au) or (02) 4922 3552

\*QS World University Rankings by Subject 2018

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### CHRIS BLEEKER



Surgeon Captain Chris Bleeker is an Anaesthetist at the Radboud University Nijmegen Medical Clinic and reserve medical officer in the Royal Netherlands Navy (RNLN). Chris started his career as medical officer for the RNLN, became a flight surgeon and head of RNLN Aviation Medicine. As chief medical officer of the airfield he was actively involved in the Airport Medical Emergency Organisation and air-sea rescue. After a tour in NATO headquarters CINCHAN in Northwood, UK he diverted to anaesthesia continuing his interests in traumatology. After qualification he gained extensive experience in trauma in South Africa, the helicopter emergency medical system and in several operational military and humanitarian missions in different countries where he acted as clinical director to the different field hospitals. Chris is currently secretary to the NATO COMEDS expert panel on Emergency Medicine. As Senior Anaesthetist for the Netherlands Armed Forces he sought a pre-deployment course for the Dutch military anaesthetists. Because there was no good course available he established the Definitive Anaesthetic Trauma Care Course as an anaesthesiological equivalent to the Definitive Surgical Trauma Care Course. This course has grown into an international organization where Dr Bleeker is chairman.

### NARAIN CHOTIROS NIRAMIT



Narain graduated from Faculty of Medicine Chiangmai University in Thailand since 1993. He has a Thai diploma Thai Specialty board General Surgery, Emergency Medicine and Trauma Surgery. Now he works as a chief of Trauma and critical care unit, Department of Surgery, Faculty of Medicine, Chiangmai University. He also works for the Royal College of Surgeon of Thailand (RCST) as an Executive board committee. He is now the National course director of ATLS Course and ASSET (Advanced Surgical Skill for Exposure in Trauma) course. He taught a lot of trauma surgery courses such as ASSET, DSTC, and Advanced Trauma Operative Approach in Thailand. He has experience in teaching international trauma training courses in many countries such as Singapore, Malaysia, Myanmar, Philippines, Taiwan and Mongolia. Besides his work, he also loves taking landscape photography whilst travelling for giving lectures in various parts in his country.

### BRYAN COTTON



Bryan A. Cotton, MD, MPH is currently a Professor in the Department of Surgery at the University of Texas Health Science Center in Houston. In addition, he is on Faculty at the Center for Translational Injury Research in Houston and is the Director of the Surgical Critical Care, Trauma Surgery and Acute Care Surgery Fellowships at UT-Houston. His clinical specialties are trauma surgery and surgical critical care. Dr. Cotton's research focuses on identifying best resuscitation strategies for hemorrhagic shock, the early prediction of patients who will receive massive transfusion of blood and blood products and use of thrombelastography to guide resuscitation and correct coagulopathy following injury. Recently, he has also investigated how best to manage severe bleeding in patient's taking newer oral anticoagulants. To these ends, he holds funding from the National Institute's of Health and the Department of Defense. In the last five years, Dr. Cotton has published over 100 manuscripts specifically related to hemorrhagic shock resuscitation, massive transfusion protocolization and early identification of the acute coagulopathy of trauma.



## SHARON HENRY



Dr. Sharon Henry was born and raised in Maryland and graduated high school from Stephen Decatur in Berlin. She left the shore to attend Duke University and graduated with a BA in chemistry. She returned to Maryland to attend medical school at The University of Maryland School of Medicine. Her anatomy table mates predicted her future in surgery. She completed her surgical residency at State University of New York Health Sciences Center at Brooklyn and followed that with a Critical Care Fellowship at the University of Minnesota. She returned to New York to begin her career at Kings County Hospital where she began her career in trauma care and critical care. She became the director of surgical critical care units at both Kings County and Downstate Hospital Centers. She returned to Maryland in 1997 to join the faculty at the University of Maryland and a trauma attending at the R A Cowley Shock Trauma Center. Dr. Henry founded the Division of Wound Healing and Metabolism and the Soft Tissue Infection Service, caring for a large number of patients with complicated soft tissue infections. Dr. Henry and her team are innovators using multimodality therapies to treat difficult wounds. She has been recognized as an international expert on soft tissue infections. The United States military refers patients to her, including injured soldiers from the war. Believing medical care has no boundaries, she was one of the first physicians airlifted to Haiti after the 2010 earthquake. Dr. Henry has an appreciation for education that originates from her parents. Beside teaching medical students, residents and fellows locally, Dr. Henry has concentrated her educational efforts serving the American College of Surgeons (ACS). In 2004, she became State Chair of the Maryland ACS Committee on Trauma (COT). She revamped the Advanced Trauma Life Support (ATLS) Course in Maryland, now considered one of the nation's models. She embraced the new ACS courses, including Advanced Trauma Operative Management (ATOM), and Advanced Surgical Skills for Exposure in Trauma Course. Dr. Henry was recognized for her efforts by the ACS, receiving the James Styner Meritorious Service Award in 2009 for her work with ATLS. In addition, she currently serves on the Surgical Skills committee and is the chairperson of the ATLS subcommittee. She is leading the 10th edition revision of ATLS course. Dr. Henry has received three Governor's Proclamations, two Shock Trauma Hero Awards and the Shock Trauma Superstar Award. Dr. Henry served as a Senior Visiting Surgeon at the Landstuhl Regional Medical Center, providing care to our wounded warriors. She was the first African American female inducted into the American Association for the Surgery of Trauma. Dr. Henry has won the Department of Surgery Medical Student and Resident Teaching Award and was recently featured in the National Library of Medicine exhibit, "Opening Doors: Contemporary African American Surgeons," where she was named as one of the thirteen most notable African American academic surgeons. In 2011 she was named the Anne Scalea Professor of Trauma Surgery at the University of Maryland School of Medicine

## MIKE HUNTER



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.

## KENJI INABA



A native of Canada, Dr. Kenji Inaba completed his undergraduate studies at McGill University, a Masters at the University of Toronto, and medical school at Queen's University. He completed his General Surgery training at the University of Western Ontario followed by sub-specialty fellowships in Surgical Critical Care and Trauma Surgery at the Ryder Trauma Center. He is board certified in Surgery and Surgical Critical Care by the American Board of Surgery and is board certified in Surgery by the Royal College of Physicians and Surgeons of Canada. He is a fellow of the American College of Surgeons and of the Royal College of Physicians and Surgeons of Canada.

Dr. Inaba is currently an attending trauma surgeon at the LAC+USC Medical Center and an Associate Professor, Clinical Scholar, of Surgery, Emergency Medicine and Anaesthesia at the University of Southern California. He is the Medical Director of the Surgical Intensive Care Unit and the Associate Trauma Medical Director. He is the Program Director for both the General Surgery Residency and the Surgical Critical Care Fellowship. While at USC he has been the recipient of 25 teaching awards including the prestigious USC Keck School of Medicine Overall Excellence in Teaching Award for the Clinical Sciences, the Alpha Omega Alpha Honorary Medical Fraternity Faculty Teaching Award and the Leonard Tow Humanism in Medicine Award. In addition to his teaching at USC, he has lectured extensively, having given more than 250 invited lectures around the world. He has mentored more than 95 research fellows and students who have garnered 28 separate research awards for this work. Dr. Inaba has authored more than 300 peer reviewed articles, 260 scientific presentations and 22 textbook chapters in the area of trauma resuscitation, diagnostics and haemorrhage control. Dr. Inaba is also a sworn Reserve Law Enforcement Officer with the Los Angeles Police Department. He currently lives in Pasadena, CA with his wife Susie and their 9 year old son Koji. He is an avid cyclist, runner and skier.

## JOHN B KORTBEEK



Dr. John B. Kortbeek is a graduate of the University of Alberta. He completed an internship at St. Thomas Hospital, Akron Ohio and a General Surgery residency at the University of Calgary. He trained as a Critical Care fellow at the University of Calgary and as a Trauma fellow at Carraway Methodist Medical Centre In Birmingham, Alabama. He has held an appointment at the University of Calgary since 1991 and is currently a Professor in the Departments of Surgery, Anaesthesia and Critical Care. Dr. Kortbeek has served as regional Trauma Services Director for Calgary, Director of the Intensive Care unit at the Foothills Medical Centre as well as Foothills Site Chief of Surgery. He served as Head of the Department of Surgery for

the University of Calgary and for the Calgary Zone, Alberta Health Services from 2006-2016. He has been an active member of many surgical and trauma organizations. He has previously served as President of the Trauma Association of Canada, Governor of the American College of Surgeons as well as Chair of the Advanced Trauma Life Support subcommittee of the American College of Surgeons' Committee on Trauma. Dr. Kortbeek currently serves as a Director for the Shock Trauma Air Rescue Society ( STARS).

## MICHAEL SUGRUE



Michael qualified 1981 from University College Galway with many undergraduate honours and awards and during his 20 years at Liverpool Hospital in Sydney he obtained his MD in 2002 for his work on Intra-abdominal Pressure and Renal Failure, on which he has published widely. He is ex-president of World Society Abdominal Compartment Syndrome and was convenor of the 2nd and 4th World Congress on the Abdominal Compartment Syndrome. He has achieved many awards for pursuit of educational initiatives included the ESR Hughes Medal from Australasian College of Surgeons in 2008. He enjoys patients and is a very hands-on working surgery. He has a keen interest in technical aspects of surgery and patient outcomes. He has published over 150 papers. Michael is currently General and Breast Surgeon in Letterkenny Hospital and Galway University Hospital Ireland. He has developed many courses in Emergency Surgery, including EASC and student EASC and Difficult Open Abdomen. The EASC course is now one of the worlds's most popular Emergency Abdominal Surgery Course and taught in 10 countries. [www.easccourse.com](http://www.easccourse.com). He is one of the champions of the Development Centre for Personalised Medicine, Clinical Decision Making & Patient Safety' (CPM) project which will improve clinical decision-making, personalised to the individual patient through collaborative academic, clinical and industry based research across Donegal, Northern Ireland Ireland Scotland and UK. Michael is looking forward to SWAN 25 – the mother of all meetings!! Michael is a keen photographer and brings more than the patient to life which his imagery (#wild\_atlantic\_photographer). He writes poems and enjoys cycling between coffees with Pauline.



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### **ZSOLT BALOGH**

Professor Zsolt J. Balogh is a trauma surgeon, the Director of Trauma at the John Hunter Hospital and the Professor of Surgery and Traumatology at the University of Newcastle, NSW, Australia.

### **RENATA BAZINA**

Dr Renata Bazina is a Neurosurgeon and Pain Specialist on staff at Liverpool Hospital. She is a Supervisor of Neurosurgery Training and a Committee member RACS pain group/ regional FPM.

### **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.

### **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.



## **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.

## **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.

## **ANDREW GILMORE**

Andrew Gilmore is a VMO and head of the Colorectal Unit at Liverpool Hospital. He originally trained in general surgery at Liverpool before spending 14 years practicing in Orange. He returned to Sydney in 2013. He has particular interest in complex laparoscopic colorectal surgery, techniques to allow laparoscopic surgery in the obese and open pelvic exenteration (chairing the Complex Pelvic Surgical Unit at Liverpool). He has the largest Australian experience in Natural Orifice Specimen Extraction (NOSE) colorectal surgery.



## **BERNIE HANRAHAN**

Bernie is a 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.

## **KEN HARRISON**

Dr Ken Harrison is an anaesthetist and trauma consultant at Westmead Hospital, a State Retrieval Consultant with NSW Ambulance and the Director of Education and Training at Careflight. His passion is education in all aspects of trauma medicine.

## **MARTIN JARMIN**

Dr Jarmin is a Philippine trained general surgeon. His fields of interest are Trauma and Acute Care Surgery . He previously worked as a Clinical Associate in Cardiothoracic Surgery at the Singapore National Heart Centre. Since 2009 , he has worked as a War Surgeon for Medecins Sans Frontieres (Doctors Without Borders) and EMERGENCY (Life Support for Civilian War Wounded) as well as ASPEN Medical in different conflict zones and disaster areas around the world. He has completed Trauma Fellowships at Liverpool Hospital in Sydney and John Hunter Hospital in Newcastle NSW . He is currently the Clinical Superintendent for Trauma and Acute Care Surgery at Liverpool Hospital.

## **LEON LAM**

Dr Leon Lam is a Radiologist at Liverpool Hospital where he is the Clinical Supervisor for Emergency and Trauma Radiology. His focus is on acute and critical care imaging with an additional interest in thoracic imaging. He is a Conjoint Clinical Lecturer at the University of Western Sydney and provides post graduate teaching to Radiology, Emergency Medicine and Intensive Care Medicine trainees at Liverpool Hospital.

## **PAUL LAMBRAKIS**

Dr Paul Lambrakis is a General Surgeon with a specific interest in Emergency General Surgery. He became the Head of the Acute General Surgery Unit at Liverpool Hospital completing a post fellowship year as the hospital's first ASU Fellow in 2013. Prior to this, Paul had completed a year of post fellowship training at Nepean Hospital in Endocrine surgery and had extensive experience in Acute Surgical Units across Sydney through his specialty training. He provides a dedicated emergency surgery service having attended to over 2000 emergency operations at Liverpool since 2013, and is an enthusiastic teacher. He is also a Conjoint Lecturer with the University of New South Wales.

## **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.

## **RYAN LOONEY**

Ryan joined Liverpool Trauma Department in 2017. He graduated from Charles Sturt University in Wagga Wagga in 2005 and completed his graduate year at Wagga Wagga Base Hospital before moving to Sydney to pursue his interest in critical care, resuscitation, and trauma. Ryan worked at Prince of Wales Emergency Department and Sydney Children's Intensive Care Unit before commencing his employment at Liverpool Hospital Emergency Department in 2010. During his time at Liverpool Emergency Department Ryan became a Clinical Nurse Specialist and completed his Masters of Nursing (Advanced Practice) at the University of Newcastle (2012). He also assumed several roles including Clinical Nurse Unit Manager and Clinical Nurse Educator. In addition to his emergency and trauma qualifications Ryan has an interest in disaster management and mass casualty training. He is a MIMMS Instructor and is an AusMAT team member.

## **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.

## **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.

## **PAUL MIDDLETON**

Associate Professor Paul Middleton is a specialist in emergency medicine trained in London, Melbourne and Sydney, and prior to this trained in surgery to FRCS(Eng). He has worked as part of prehospital trauma and helicopter critical care retrieval teams in both the UK and Australia, and is the Immediate Past Chair of the NSW branch of the Australian Resuscitation Council. He is currently Director of the Emergency Medicine Research Unit at Liverpool Hospital, and is Deputy Director of Emergency Medicine. His former roles include several years as Medical Director of the Ambulance Service of NSW, founding Director of the Ambulance Research Institute and Chief Medical Officer to St John Ambulance, Australia.

## **ROB MOLNAR**

Dr Robert Molnar graduated from the University of New South Wales in 1994. He completed his Orthopaedic training in 2002 in Sydney and then undertook further training in both joint replacement surgery and trauma. Following a fellowship in lower extremity reconstructive surgery in hip and knee arthroplasty and arthroscopy, he worked as a trauma fellow at Harborview Medical Centre in Seattle. At the completion of the fellowship he was employed as a consultant trauma surgeon for a further 6 months before returning to Australia to begin his own practice.

## **LOUISE NIGGEMEYER**

Ms Louise Niggemeyer RN is the Trauma Program Manager at The Alfred Hospital with over 25 years in experience in trauma care and has extensive experience in senior clinical and non-clinical trauma related roles. Louise was involved in the design and implementation of both The Alfred Trauma Service and the Victorian State Trauma System. As a national leader in hospital-based trauma registries, Ms Niggemeyer has developed a comprehensive Trauma Registry model for The Alfred that has been modified by many trauma registries throughout Australia. Ms Niggemeyer is regarded by her peers as one of the leading Trauma Nurses in Australasia and is currently a member of the Royal Australasian College of Surgeons Trauma Verification Subcommittee. Her trauma focus is Trauma Research, Trauma Registry, Systems Development, Clinical Care, Education, Quality and Safety.

## **CHRIS PARTYKA**

Chris Partyka works as both a Staff Specialist Emergency Physician at Liverpool Hospital as well as a Prehospital and Retrieval Physician for Greater Sydney Area HEMS (NSW Ambulance). His interests include resuscitation, point of care ultrasound and medical education. Chris is co-founder of the Emergency Medicine Ultrasound Group (EMUGs) and shares his critical care lessons through his FOAM blog '*theblundissection*'.

## **DAVID READ**

Dr David Read is a General Surgeon and the Director of Trauma & Burns at the National Critical Care and Trauma Response Centre (NCCTRC) at the Royal Darwin Hospital. He has a very broad based surgical practice but has a particular interest in Trauma and Burns, Surgical Oncology and Paediatrics. As an Army Reservist he has deployed to East Timor, Iraq and Bali. He has also been involved in the RDH response to the Bali bombings and East Timor, Ashmore Reef, and the AUSMAT deployment to the Philippines after Typhoon Haiyan in 2013. An avid teacher, he is an instructor on EMST, EMSB, DTSC and the Surgical & Anesthetic AUSMAT course. He has extensive experience in Indigenous Health and has an interest in the delivery of specialist services to remote Indigenous communities.

## **GLEN SCHLAPHOFF**

Dr Glen Schlaphoff is an experienced Interventional Radiologist and has been a Senior Staff Specialist in Liverpool Hospital since 2001. He has been the Director of Radiology since 2005 to 2015 and involved with the redevelopment of Liverpool Hospital. During this redevelopment he was involved in redesigning the Radiology department and pioneered the concept of the creation of a Department of Interventional Radiology. He now is the Director of Interventional Radiology at Liverpool Hospital. He is a founder partner of Spectrum Medical Imaging , a large high end, sub-specialist private radiology practice with multiple branches in the East and West of Sydney. He attends and presents at many local and international meetings and is an active IRSA member (Interventional Society of Australasia). His particular interests are in interventional radiology, with particular interests in vascular and cardiovascular imaging, pain relief and spinal injections including vertebroplasty. He is also keenly involved in all aspects of interventional and diagnostic oncology offering a wide range of therapies and interventions to oncology patients – especially those with liver disease, including DC Beads SIRTEX, microwave and Radio-frequency Ablation. He is a pioneer in Australia in Prostate Artery Embolisation and Cryotherapy for Renal Cancers. He is an active contributor to the many multidisciplinary meetings held at Liverpool Hospital. He runs an Interventional radiology clinic at Liverpool Hospital

## **PHIL TRUSKETT**

Phil Truskett is a General Surgeon with an interest in Upper GI and HPB Surgery at the Prince of Wales Hospital, Sydney, where he is a senior staff specialist. He has taken an active role in both the Royal Australasian College of Surgeons and the specialty society General Surgeons Australia. He is a past President of General Surgeons Australia. As a College councillor he has served on many College committees. Most recently, he was the Chair of the Board of Surgical Education and Training and then past Censor in Chief. He is the immediate past President of the College of Surgeons. He is the Chair-Elect of the Council of Presidents of Medical Colleges (CPMC). He is Patron of the Australian Indigenous Doctors Association (AIDA). He is an advocate for “closing the gap” health-care initiatives. His major interest is in the provision of Emergency Surgery to our community in our current challenging environment. As a result, he has been involved in the design and assessment of models of care to provide consultant-led timely care. These models of care are now being adopted in Australia and New Zealand. He is a strong advocate of sustainable surgical services, as the provision of patient-centred care in a safe, clinical environment is the benchmark by which we are all judged as professionals and how we should judge one another. It is education in the non-technical skills of surgery which will strengthen our place in the community. This education is a current focus.

## **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.

## SWAN SCIENTIFIC PROGRAM

### Friday 28<sup>th</sup> July 2017

07:45 - 08:00	WELCOME	S.D'Amours
08:00 – 10:00	Session 1: Plenary Session Grand Ballroom	
	<b>TALES FROM ...</b>	
	<b>Chair: M. Hunter</b>	
08:00 – 08:15	The Blarney Stone	M.Sugrue
08:15 – 08:30	Chiang Mai	N.Chotirosniramit
08:30 – 08:45	The Top End and Outback	D.Read
08:45 – 09:00	LA County Gang War Zones	K.Inaba
09:00 – 09:15	Shock Trauma Baltimore	S.Henry
09:15 – 10:00	<b>CASE SCENARIO</b>	J. Crozier
	<b>Panel:</b> B. Cotton, P. Liston, B. Burns, N. Chotirosniramit, L. Niggemeyer, W. Wallace, L. Lam	
10:00 – 10:30	<b>MORNING TEA</b>	
10:30 – 12:30	Session 2A: Concurrent Session Ballroom 1	
	<b>HARD TALK</b>	
	<b>Chair: K. Martin</b>	
10:30 – 10:45	Mesh in a Contaminated Field	S.Henry
10:45 – 11:00	REBOA - Prehospital, ER, OR or not at all?	K.Inaba
11:00 – 11:15	Strategies to Reduce Missed Injuries	L.Niggemeyer
11:15 – 11:30	IVC Filters - Love them or Hate them?	J.Crozier
11:30 – 11:45	Are TEG and ROTEM useful in the Trauma Bay?	B.Cotton
11:45 – 12:00	Inflammation & Modern Trauma Care	Z. Balogh
12:00 – 12:30	Question Time with the Panel	
10:30 – 12:30	Session 2B: Concurrent Session Ballroom 2	
	<b>FREE PAPERS</b>	
	<b>Chair: A. Fitzgerald &amp; S. Forrest-Holder</b>	
10:30 – 10:42	Trauma and Psychiatric Disorders, A Systematic Review	E. Clous
10:42 – 10:54	A Pilot Study Geocoding the Trauma Registry	B. Gardiner
10:54 – 11:06	The Effect on Mortality of Trauma Changes	R. Maguire
11:06 – 11:18	Red Blankets and ROTEM	E. Wake
11:18 – 11:30	Thoracic Impalement Injuries in a Single Trauma Center	E. Cua
11:30 – 11:42	Abdominal Surgery	L. Tang
11:42 – 11:54	Falls From Heights Psychiatric Comorbidity/Complications	E. Clous



12:30 – 13:30 *LUNCH*

13:30 – 15:00 Session 3A: Concurrent Session  
Ballroom 1

**PREHOSPITAL / EMERGENCY ROOM**

**Chair: A. Giles**

13:30 – 13:45	When do you Activate the MTP?	K. Harrison
13:45 – 14:00	Arterial or Venous Gases - Does it make a Difference?	B.Hanrahan
14:00 – 14:15	Staff Safety in the ER - Strategies	B.Burns
14:15 – 14:30	Who needs a PAN CT?	J.Kortbeek
14:30 – 14:45	FAST Scan in Stable Blunt Trauma Patients?	C.Partyka
14:45 – 15:00	Question Time with the Panel	

13:30 – 15:00 Session 3B: Concurrent Session  
Ballroom 2

**TRAUMA OPERATIVE SURGERY**

**Chair: D. Read**

13:30 – 13:45	Repair, or Remove? High Grade Kidney Injuries	M.Hunter
13:45 – 14:00	Pancreaticoduodenal Trauma - Operate or Not?	M. Langcake
14:00 – 14:15	Damage Control Laparotomy - What's New?	B.Cotton
14:15 – 14:30	Exploring Retroperitoneal Haematomas	N.Chotirosniramit
14:30 – 14:45	Pelvic Packing or Angio - Has it Been Resolved?	R. Molnar
14:45 – 15:00	Question Time with the Panel	

15:00 – 15:30 *AFTERNOON TEA*

15:30 – 17:00 Session 4: Plenary Session  
Grand Ballroom

**MARIA SEGER KEYNOTE ADDRESS**

**Chair: M. Sugrue**

15:30 – 16:00	Keynote Address - Trauma Training in the Modern Era	S.Henry
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16:00 – 16:55 **CASE SCENARIO**

M.Sugrue

**Panel:** S. Henry, M. Hunter, A. Giles, R. Bazina, R. Looney,  
L. Lam, K. Harrison

16:55 – 17:00	Education Achievement Presentation Citation to be read by J. Crozier – Chair of RACS Trauma Committee & RACS Council Member	
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## Saturday 29<sup>th</sup> July 2017

08:30 – 10:00 Session 1: Plenary Session  
Grand Ballroom

### **HARD TALK - 3 PAPERS THAT CHANGED MY PRACTICE**

**Chair: K. Inaba**

08:30 – 08:45	Emergency Surgery	P.Truskett
08:45 – 09:00	Trauma	J.Kortbeek
09:00 – 09:15	Critical Care	P.Liston
09:15 – 09:30	Emergency Medicine	P.Middleton
09:30 – 10:00	<b>CASE SCENARIO</b>	S. D'Amours

**Panel:** K. Inaba, J. Kortbeek, P. Middleton, C. Bleeker,  
S. Forrest-Holder, G. Schlaphoff

10:00 – 10:30 **MORNING TEA**

10:30 – 12:00 Session 2A: Concurrent Session  
Ballroom 1

### **CONUNDRUMS IN TRAUMA CARE**

**Chair: S. D'Amours**

10:30 – 10:45	The Occult Pneumothorax - Irrelevant?	J.Kortbeek
10:45 – 11:00	Pregnant Trauma Patient Imaging	K.Martin
11:00 – 11:15	Advanced Hybrid Environments	G.Schlaphoff
11:15 – 11:30	Traumatic Abdominal Wall Disruptions	N.Chotirosniramit
11:30 – 11:45	Errors in Management of Liver Trauma	K.Inaba
11:45 – 12:00	Question Time with the Panel	

10:30 – 12:00 Session 2B: Concurrent Session  
Ballroom 2

### **EMERGENCY SURGERY**

**Chair: S. Henry**

10:30 – 10:45	Severe Lower GIT Bleeding - Best Practice	A.Gilmore
10:45 – 11:00	Ischaemic Mesenteric Catastrophes	J. Crozier
11:00 – 11:15	Middle of the Night or in the Light of Day	M.Hunter
11:15 – 11:30	Interval Appendicectomy - Thing of the Past?	M.Sugrue
11:30 – 11:45	Decision Making in Adhesive SBO	P.Truskett
11:45 – 12:00	Question Time with the Panel	

12:00 – 13:00 **LUNCH**

13:00 – 15:00 Session 3A: Concurrent Session  
Ballroom 1

### **TRAUMA/CRITICAL CARE COMPLEXITIES**

**Chair: K. Harrison**

13:00 – 13:15	Sleep Disturbances in the ICU	B.Cotton
13:15 – 13:30	Who Needs an ICP Monitor?	R. Bazina
13:30 – 13:45	Training Trauma Anaesthetists	C.Bleeker
13:45 – 14:00	The Real Cost of Rib Fixation	K. Martin
14:00 – 14:15	Daily CXR - Clinical Relevance	K.Inaba
14:15 – 14:30	Tracheostomy - If and When?	P.Liston
14:30 - 14:45	Question Time with the Panel	

13:00 – 15:00 Session 3B: Concurrent Session  
Ballroom 2

### **EMERGENCY SURGERY**

**Chair: V. Malka**

13:00 – 13:15	The Role of Laparoscopy in the Acute Abdomen	P.Lambrakis
13:15 – 13:30	Acute Cholecystitis - Best Practice	A. Fitzgerald
13:30 – 13:45	Unexpected Findings at Laparotomy	M.Sugrue
13:45 – 14:00	Management of Complex Wounds	S.Henry
14:00 – 14:15	Prolonged Ileus - Tricks and Strategies	M.Hunter
14:15 – 14:30	Stomas - The Good, the Bad and the Ugly	A.Gilmore
14:30 - 15:00	Question Time with the Panel	

14:45 – 15:15 **AFTERNOON TEA**

15:15 – 16:30 Session 4: Plenary Session  
Grand Ballroom

### **GREAT DEBATES**

**Chair: M. Hunter**

15:15 – 15:45 **CASE SCENARIO** M. Hunter

**Panel:** K. Inaba, P. Liston, C. Partyka, S. Henry, L. Niggemeyer,  
L. Lam, W. Wallace

15:45 – 16:05 **Great Debate**  
Malcolm Turnbull would make a better Trauma Surgeon than Donald Trump  
**For:** A. Giles **Against:** M. Sugrue

16:05 - 16:25 **Great Debate**  
All Grade 3 Plus Splenic Injuries must be Embolised  
**For:** K. Inaba **Against:** J. Kortbeek

16.25 - 16.30 Prizes and Closing Remarks

## THE BLARNEY STONE

Michael Sugrue

200 years have passed in time with the tradition of kissing the Stone at the top of Blarney Castle in Cork Ireland. Steeped in history and mystique. A heritage as long as Liverpool Hospital's 200 years. Providing an opportunity to dream and seek new qualities. Emergency general surgery has lagged behind its Trauma surgery counterpart. Ireland was the location for one of the World's first performance and quality summit in Emergency Surgery. This summit held in Donegal Ireland in July 2106, just 500 km from Blarney Castle

### Aim

This presentation will explore the development of quality performance indications in Emergency Surgery and review some key performance indications coming from the Donegal Summit The Donegal Summit was unique in that Clinicians across many disciplines started a process for setting arbitrary, but clinically relevant, resource and performance expectations in the delivery of Emergency and Acute Care Surgery. It followed the Dublin World Society of Emergency Surgery Summer meeting, with significant input from the Society of the Abdominal Compartment and support of the Royal College of Surgeons of Ireland, the Health Service Executive of Ireland and the Donegal Clinical Research Academy. The aim of the Donegal Summit was to set a platform in place to develop guidelines and KPIs in Emergency Surgery.

### Methods

The project had multidisciplinary global involvement in producing consensus statements regarding emergency surgery care in key areas, and to assess feasibility of producing KPIs that could be used to monitor process and outcome of care in the future.

### Results

44 key opinion leaders in emergency surgery, across 7 disciplines from 17 countries, composed consensus based position papers on 14 key areas of emergency surgery and 112 KPIs in 24 acute conditions or emergency systems.

**Table 1 Key Performance Indicators Topics**

- Appendicitis
- Cholecystitis
- Pancreatitis
- Perforated Ulcer
- Gastrointestinal bleeding
- Bowel Obstruction
- Diverticulitis
- Mesenteric Ischaemia
- Abdominal Vascular Emergencies
- Coagulation
- Complex Pneumothorax and Empyema
- Septic Shock in Emergency; ICU
- Fluid Resuscitation in Septic Shock
- Abdominal Compartment Syndrome
- Geriatric Care
- Triage; ICU Admission
- Laboratory
- Wound Care
- Emergency Theatre
- Health Care Systems

## Conclusions

The Summit was successful in achieving positions papers and KPIs in emergency surgery. While position papers were limited by non-graded evidence and non validated KPI's the process set a foundation for the future advancement of Emergency Surgery. This unique meeting may act as a documented catalyst to advance Emergency Surgery Care. Emergency Surgery may eventually catch up with some of the Trauma Advances.

Rather than kissing the Blarney Stone-lets leave no stone unturned to get the best outcomes for patients

## Reference

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Tolstrup MB, Watt SK, Gögenur I. Morbidity and mortality rates after emergency abdominal surgery: an analysis of 4346 patients scheduled for emergency laparotomy or laparoscopy. *Langenbeck's Arch Surgery* 2016; 9:1-9.

## CHIANG MAI

## Narain Chotirosniramit

Chiangmai is the largest city in Northern Thailand. It is 700 km north of Bangkok and is situated amongst the highest mountain of the country. Chiangmai means "new city" because it became the new capital of the Lanna Kingdom when it was founded in 1296. Chiangmai was one of the two tourist destination in Thailand and list of "25 Best destination in the world" (1) While officially the city of Chiangmai with a population of 160,000 The Chiang Mai Metropolitan Area has a population of nearly one million people, more than half the total of Chiang Mai Province. Chiangmai has a tropical wet and dry climate tempered by the low latitude and moderate elevation, with warm to hot weather year-round, though nighttime conditions during the dry season can be cool and much lower than daytime highs. The maximum temperature ever recorded was 42.4 °C (108.3 °F) in May 2005.

Chiangmai has over 300 Buddhist temples. Chiang Mai hosts many Thai festivals, including Loi Krathong , Songkran, Chiang Mai Flower Festival etc. There are about 7 million tourist visiting Chiangmai each year. In 2015, From the WHO global status report on road safety ,Thailand was in the second rank of the highest road traffic death rate of the world (36.2 per 100,000 population)(2). Chiangmai also had the same problem because the majority of people in Chiangmai travel by motorcycle and the helmet wearing rate is just 50% (3). With this reason the traumatic brain injury is the most common cause of death.

Maharaj Nakorn Chiangmai Hospital is the biggest hospital in Northern Thailand with the capacity of 1,400 beds. This hospital is under Faculty of Medicine, Chiangmai University (CMU). We provided the teaching for medical student and various residency training. This hospital is also the tertiary care for every specialty treatment. CMU Trauma center has been established in since 2005 to improve the quality of trauma care of the hospital and improve the trauma referral system. Since we started our trauma center service , the inhospital mortality rate for trauma cases was 7.35%, until now the mortality rate has been improved to 4.13%. We still work so hard to provide better quality trauma care for people in Northern Thailand.

1 "Best Destinations in the World; Travelers' Choice Awards 2014". *TripAdvisor*. Retrieved 2014-12-12.

2. *Global status report on road safety 2015, World Health Organization*. 2015, 235

3. *Thailand motorcycle helmet use in 2014, Thai Health Center* , 2014 , 50



## **THE TOP END AND OUTBACK**

**David Read**

The Top End of the Northern Territory is sparsely populated with 150,000 persons living in an area of 500,000KM<sup>2</sup>. Health infrastructure is sparse, and retrieval times long, at a median of 6 hours. Apart from the geographical barriers, significant cultural and linguistic challenges exist for the 30 percent of territorians that are indigenous. Many of whom live very remotely. Hence a novel approach to a Trauma system is required.

This talk will cover a Pot Poori illustrating some of these challenges such as retrieval, remote health literacy, the effect of remoteness and efforts lobbying for improved safety regarding road, watercraft and alcohol usage.

## **LA COUNTY GANG WAR ZONES**

**Kenji Inaba**

The city of Los Angeles is often referred to as the Gang Capital of the United States. It is estimated that there are more than 1350 Gangs operating in the city with over 120,000 members. Gangs and their subdivisions, Cliques, are often delineated along racial and territorial divides, and are named for these particular attributes. One of the primary goals of these gangs is economic, using violence and fear to stake out their territory and commit these unlawful acts within this area.

The net impact on the city and its inhabitants is significant. As a direct comparison with Sydney, while the greater Sydney area encompasses a vast area of approximately 12K square kilometers in comparison to the 1200 square kilometers of Los Angeles, the populations are relatively similar with 5 million in Sydney and 3.9 million in LA. There is however a vast difference in the crime rates between these two cities. Population estimates for 2016 show that whether one looks at property crimes or violent crimes, LA far outpaces Sydney. As examples of this, in 2016, there were 7,234 motor vehicle thefts in Sydney compared to 18,678 in LA. Even more striking are the rates of violent crime such as homicide, 294 in LA, for a population a million people smaller than Sydney where there were only 42.

These differences translate directly across to the volume and type of trauma seen by the trauma centers in this catchment area. In this talk an overview of this problem as well as our efforts at prevention will be discussed.

### **References**

1. Hutson, HR et al. The perspectives of violent street gang injuries. *Neurosurg Clin N Am* 1995;6(4):621
2. Hutson, HR et al. Adolescents and children injured or killed in drive by shootings in Los Angeles. *N Engl J Med.* 1994;330(5):324
3. Hutson, HR et al. Minimizing gang violence in the emergency department. *Ann Emerg Med* 1992 21(10):1291

## **SHOCK TRAUMA BALTIMORE**

**Sharon Henry**



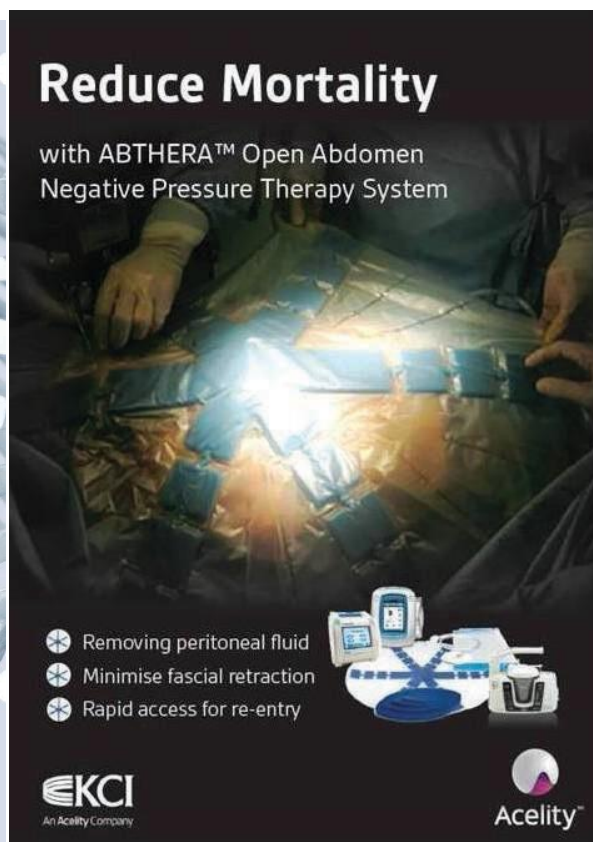
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**MESH IN A CONTAMINATED FIELD**

**Sharon Henry**

For patients in severe hemodynamic compromise after trauma, the optimal method of Aortic occlusion has recently become unclear with the (re)introduction of Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) as a treatment option. Aortic occlusion is performed in the setting of hemorrhagic volume depletion in an effort to increase central aortic pressure, carotid flow and improve brain oxygenation. Traditionally, aortic occlusion has been accomplished by supradiaphragmatic clamping of the descending thoracic aorta through a resuscitative thoracotomy. This is a procedure that is highly invasive and by nature of the patient population in which it is performed, associated with extremely poor outcomes.

REBOA consists of the placement of a purpose built occlusive balloon through the Common Femoral Artery into the aorta, designed to occlude flow past the balloon. This is not a new technique and has been described as far back as the Korean War. It is also being used for the resuscitation of patients with ruptured abdominal aortic aneurysms. Access is percutaneous, under ultrasound guidance. The procedure can be performed in the ER or the OR under fluoroscopic guidance. It is designed for patients with a subdiaphragmatic source of bleeding, where balloon occlusion of the aorta would mitigate ongoing volume loss while preferentially allowing perfusion of the heart and brain. This would facilitate volume loading and ultimately prevent progression to arrest and allow a window for surgical or endovascular stoppage of the source of blood loss. The use of this procedure in the fully arrested patient is controversial and at our center we do not use it in this setting. Arresting patients require a resuscitative thoracotomy so that direct cardiac resuscitation can take place. Likewise, for bleeding sources above the diaphragm, balloon occlusion would be of questionable value. The exact indications for REBOA insertion and the true outcomes and complication burden associated with its use are still unclear. At our center, we utilize REBOA in the severely hypotensive but not yet arrested patient who has sustained blunt multi-system trauma. We do not use it in patients with penetrating trauma, and we do not use it if the primary source of hemorrhage is localized to the chest.

One of the most recent developments in the use of REBOA for trauma patients has been the FDA clearance of a new low profile device that can be inserted through a 7Fr. Sheath. The practical implications of this are substantial. The kit that we keep in the Resuscitation bay has also been streamlined and now consists of two micropuncture access kits, two 8Fr. Sheaths, one ER-REBOA catheter (Prytime Medical, Boerne Tx), one 30cc syringe with contrast, suture/driver and a Sharpie.

The purpose of this debate will be to introduce the concept and technique of balloon occlusion of the aorta, and to highlight the unanswered questions that remain so as to provide the audience with a practical overview of the current status of REBOA use here in North America.

## **References**

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2. Brenner, ML et al. A clinical series of REBOA for hemorrhage control and resuscitation. *J Trauma*. 2013;75(3):506-511
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## STRATEGIES TO REDUCE MISSED INJURIES

Louise Niggemeyer

An injury diagnosis that was not made at the time definitive evidence of the diagnosis was present is a missed injury. Patients and carers often report that while they survived the traumatic event, the most pressing long term morbidity challenge is related to the missed injury. In this short presentation I will explore three useful strategies to reduce missed injury occurrences: metacognition; the Tertiary Trauma Survey and workplace culture.

Missed injuries can occur in any body region and they must be related to the initial trauma event. A missed injury diagnosis as a concept has been described with different meanings depending when the diagnosis is made within the care continuum. Furthermore, it is commonly confused with the concept of delayed diagnosis or injury sequela. Overall, rates are reported to range between <2% to >30%<sup>1</sup>. The most reliable definition with greatest external validity, is *a diagnosis made after the patient has been discharged from the acute episode of care*. Researchers and quality monitoring staff must specify the operational definition applied when reporting occurrences.

Metacognition is integral to how humans' think. The knowledge applied to the patient's care drives clinical decision making. Ensuring staff have the requisite knowledge where supervised developing practitioners form the bulk of the workforce is challenging. Staff must be academically prepared for the work they are required to undertake<sup>2</sup>.

Comprehensive patient assessment requires a systematic and methodical approach with clinical findings and investigation outcomes driving the plan of care. The Tertiary Trauma Survey (TTS) Tool is a widely held mainstay in Trauma Services and has been demonstrated to reduce missed injury occurrence<sup>1-5</sup>.

The Workplace Culture should integrate human factors science and workplace systems to support clinical decision making especially by developing practitioners. A non-punitive clinical audit system based on robust timely performance monitoring and quality improvement data encourages staff to engage in reflection in practice; which in turn leads to workflow optimisation and a reduction in missed injury occurrence<sup>1,2</sup>.

Missed injuries will always be with us until our technology has advanced to the point where every part of the human body can be intricately assessed biomechanically. Perhaps in our lifetime every joint, muscle and organ tissues will be assessable via non-invasive diagnostic tools with clinical decision support technology. In the meantime, we will continue with our tried and true systems that when consistently applied have been demonstrated to reduce missed injury occurrence.

## References

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## **IVC FILTERS – LOVE THEM OR HATE THEM?**

**John Crozier**

Several patterns of traumatic injury are associated with a high probability of venous thromboembolic events. Pharmacoprophylaxis against VTE is associated with unacceptable risks of bleeding in a number of cases.

A caval filter is designed to entrap thromboembolus and to prevent pulmonary emboli. Its deployment does not require the concurrent administration of VTE pharmacoprophylactic agents.

A wide range of caval filter designs currently exist. Many complications related to their deployment, useage and removal are described. Many varieties of caval filters are no longer marketed because their associated complications have outweighed their treatment benefits.

Very few good quality prospective studies exist to provide high quality evidence to underpin practice management guidelines on the utilization of caval filters in the context of trauma

Clinicians within institutions managing trauma should, ideally

- adhere to an institution approved practice management guideline for caval filter insertion in trauma patients

- maintain a prospective register of caval filter deployments and removals

- supervise the number of proceduralists deploying and retrieving caval filters, and their outcomes

- utilize caval filters in trauma patients within the context of prospective trials

## **ARE TEG AND ROTEM USEFUL IN THE TRAUMA BAY?**

**Bryan Cotton**

Thrombelastography (TEG) and rotational thromboelastometry (ROTEM) represent two currently available viscoelastic testing systems that help guide blood component and hemostatic adjunct administration in trauma patients. While both are marketed as point-of-care devices, the performance and interpretation of each is far from the simplicity of a blood glucose check. However, these devices offer the opportunity to guide care of the patient early in the resuscitation of the injured patient and to direct care based on specific disturbances in the coagulation cascade. This talk will focus on the limitations of traditional coagulation testing, the advantages and disadvantages of viscoelastic devices, and similarities and differences of these devices. As well, the impact of their use in reducing blood product use and improving survival will be reviewed.

## **INFLAMMATION AND MODERN TRAUMA CARE**

**Zsolt Balogh**



## FREE PAPER SESSION

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### TRAUMA AND PSYCHIATRIC DISORDERS, A SYSTEMATIC REVIEW

Emile Clous

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#### Background

Suicide is currently a topic of high priority for policy-makers, researchers and clinicians. The World Health Organization estimated 804.000 suicide deaths worldwide in 2012. Some studies that focused on patients with self-inflicted injury revealed that mortality in this group is higher than for patients who sustain unintentional injury.

#### Objectives

To determine whether trauma patients with a psychiatric disorder or after attempting suicide are at higher risk of a complicated course than patients without a psychiatric disorder or accidental cause. The secondary objective was to provide an overview of the current literature on the same group of trauma patients with psychiatric comorbidity in regards to mortality rate, length of stay, hospital costs and quality of life.

#### Methods

We searched Pubmed, Embase and PsycInfo electronic databases. All searches were updated to March 2016. The methodological quality was assessed using the QUIPS tool.

#### Results

Our search identified 9284 articles (Pubmed 3660, Embase 2590, PsycInfo 3034). Of these, 18 articles were included. All studies were observational studies, 17 retrospective studies and 1 prospective study. Sample size varied from 44 to 138.589 patients with a median of 415 (IQR 83-785) patients.

#### Conclusion

Patients who have a psychiatric disorder or who have attempted suicide are at higher risk of increased in-hospital mortality and prolonged length of stay after sustaining injuries. These patients also tend to be at higher risk of complications after severe trauma, however future research is needed to confirm these potentially important implications.

### A PILOT STUDY GEOCODING THE TRAUMA REGISTRY

Ben Gardiner

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#### Abstract

**Introduction:** Within the current Trauma landscape, injury location by postcode is a mandated field within the Australian Trauma Registry, Bi-National Trauma Minimum Data Set. In March 2017 the Australian Trauma Registry revealed the intention to review the applicability of Geocoding injury location was proposed.

Geocoding in population health epidemiological studies is common practice, although within trauma this has been isolated to only a few studies. The Midlands Registry (NZ) has demonstrated the potential benefits of geocoding in trauma registries identifying 'hot-spots' and engaging with local communities for injury prevention.

**Methods:** Gold Coast University Hospital undertook a retrospective spatial review of over 4000 incidents, which demonstrated that utilising postcodes has inherent issues in the correlation of injury and location. A subsequent pilot of over 100 prospectively collected geocoded injury locations indicated improved heat analysis.

By July 2017, we are aiming to have over 1000 incidents which meet the ATR inclusion criteria retrospectively and prospectively geocoded to demonstrate a parallel spatial review.

**Results:** We have demonstrated that this is a feasible process for us to achieve. The results of the Gold Coast Trauma Registry spatial mapping via postcode are contrasted with the interim results of our geocoding of location of injury.

**Conclusion:** Issues presented are achievements and hurdles regarding collection of geocodes; and results of retrospective and prospective collection methodologies.

It is our belief that geocoding can assist the development of partnerships with communities to develop health prevention in trauma and that collation of geocoding of injury location is the key.

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## **EFFECT ON MORTALITY BY CHANGES TO THE TRAUMA MODEL OF CARE: Richard Maguire A SINGLE CENTRE EXPERIENCE**

### **Authors:**

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### **Introduction:**

The management of major trauma in a dedicated trauma centre has been shown to be associated with better outcomes. Gold Coast University Hospital's recent upgrade to a tertiary facility came with a trauma service. We examined the effects on mortality in major trauma (ISS >12) with changes to the trauma service model of care. Such changes included a dedicated Trauma surgeon, patients under the primary care of the trauma team and a dedicated trauma ward.

### **Methods:**

A retrospective analysis of trauma patients was performed between the 18 months periods of February 2014 – July 2015 (pre-implementation; period 1) and August 2015 – January 2017 (post-implementation; period 2).

Mortality rates in major trauma (ISS >12) and mean ISS were compared over these two times periods and statistical analysis performed.

### **Results:**

The mortality rate in major trauma in period 1 was 10.1% (36 deaths/ 386 patients) compared to 6.04% (27 deaths/447 patients) in period 2, which is a significant reduction in mortality rate.

Martin Wullschlegler<sup>1,3</sup>, Elizabeth Wake<sup>1</sup>, Don Campbell<sup>1</sup>, Kerin Walters<sup>1</sup>, Matthew Hedge<sup>3</sup>, Debbie Ho<sup>3</sup>  
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### Objective/Introduction:

Red Blanket is the process for enabling the rapid transfer of non-responding, shocked trauma patients from the ED/Helipad to the OT for haemorrhage control. The protocol was implemented in February 2015.

### Methods:

This observational study included all adult trauma patients who had a Red Blanket Protocol activated. Data collection included; patient demographics, ISS, hospital LOS, ICU LOS and blood product usage.

### Results:

23 patients had a Red Blanket activated with a median ISS of 29. 15 had an exploratory laparotomy; 2 required IR. ED to Red Blanket protocol activation time was 13 minutes (median). Initial ROTEM analysis was performed 21.5 mins after ED arrival.

270 PRBC units were transfused in total with a median of 7 units transfused within the initial 24 hours. 17 patients (74%) received PRBC prior to arrival at hospital. Median time from ED arrival to 1<sup>st</sup> PRBC transfusion was 7 minutes.

298 units of cryoprecipitate were transfused as part of initial resuscitation with a median of 20 Units transfused per patient. Median time from ROTEM<sup>®</sup> to Cryoprecipitate transfusion was 48 minutes. 60g of FC were transfused as part of initial resuscitation with a median of 4g. Median time from ROTEM to FC transfusion was 19 minutes.

6 patients died in ICU; 1 in the OT.

### Conclusions:

The results indicate that use of ROTEM<sup>®</sup> guided transfusion strategy can be performed in conjunction with a red blanket and does not delay the initiation of a Red Blanket protocol or transfusion of blood products as part of a MHP.

## THORACIC IMPALEMENT INJURIES IN A SINGLE TRAUMA CENTER

Elaine Cua

The study aims to present the profiles and management outcomes of patients with thoracic impalement injuries at an end-referral trauma center in a public tertiary hospital in Metro Manila, Philippines. A retrospective review of patients with thoracic impalement injury between January 1, 2011 and July 30, 2016 was done. The patients were identified using the institution's Integrated Surgery Information System. Demographic and clinical data, radiographic findings, procedure/s undergone, and three month follow-up data were obtained. Twelve patient charts were reviewed: all were male, two (2) were less than 12 years old, and ten (10) were adults. The patients' pre-hospital time range from 1-30.5 hours post-injury, and they all arrived at the emergency room hemodynamically stable. Ten (10) cases were accidental and five (5) cases involved impaled knife. Chest radiography was done in all patients. Eight (8) patients underwent thoracotomy, one (1) had tube thoracostomy only, one (1) had thoracoscopy and two (2) had local wound exploration, but all patients needed surgical exploration in the operating room. The average length of hospital stay for those who had thoracotomy was 7.5 days while those who had tube thoracostomy was 3 days. The average length of catheter drainage was 3 days. Only one mortality was reported due to acute respiratory failure from a comorbidity of pulmonary tuberculosis while the rest recovered with no morbidity. The core management of thoracic impalement injuries is rapid transport to hospital, maintenance of stability of the impaled object and to retrieve the object under direct visualization of the impaled object. With the advent of thoracoscopy, the option of video-assisted thoracoscopic surgery compared to outright thoracotomy in hemodynamically stable patients remains to be explored.

*Linda Tang MBBS, Natasha Brown MBBS, Mark Muhlmann MBBS (Hons) FRACS*

Prince of Wales Hospital, University of New South Wales, Sydney, New South Wales Australia

**Background:** There is minimal literature examining morbidity and mortality of the very elderly undergoing surgery. This is a single centre retrospective case series looking at mortality and morbidity of nonagenarians undergoing emergent and elective abdominal surgery.

**Method:** A retrospective review of medical records of all patients over 90 years of age who underwent elective and emergent abdominal surgery was conducted at the Prince of Wales Hospital. Demographics, comorbidities and morbidity and mortality was collected using a standardised abstraction sheet.

**Results:** Between 2011 and 2015, 24 patients over 90 years of age underwent elective and emergent general abdominal surgery. All patients had comorbidities and 83.3% (n = 20) were living at home prior to surgery. The average length of stay was 14.2 days, 58.3% (n=14) of patients were admitted to ICU/HDU post operatively, in-hospital mortality was 33.3% (n=8) and remained the same at 30 days' post procedure. The mortality at 180 days and 365 days was found to be 54.17% (n=13) and 58.33% (n=14) respectively. The emergent compared with the elective operations demonstrated a greater in-hospital and 30-day mortality (37.5% vs 25%) but similar 365-day mortality (56.25% vs 62.5%). Of the patients who were deemed to have a high P-Possum mortality score, only 33% (n=5) suffered in hospital mortality.

**Conclusion:** Abdominal surgery in the very elderly is associated with considerable morbidity and mortality. Close to 60% of nonagenarians who underwent abdominal surgery die within 1 year from their surgery. P-Possum was not a good predictor of mortality in this age group.

# FALLS FROM HEIGHT PSYCHIATRIC COMORBIDITY AND COMPLICATIONS

Emile Clous

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3 Trauma Department, Liverpool Hospital, Sydney, Australia

4 Department of Psychiatry, Academic Medical Center, Amsterdam, The Netherlands

**Introduction:** The objective of this study was to evaluate the risk of a complicated course after falls from height and to review the impact that psychiatric comorbidity has on complication rates.

**Methods:** In this retrospective observational study all patients after a fall from height greater than 5 meters were included. A comparison was made between two cohorts over a 10-year period (2005-2014) from two major teaching hospitals (level I Trauma centers) in Amsterdam (Netherlands) and Sydney (Australia). These data were combined with local complication registries and supplemented by chart review to evaluate psychiatric comorbidity and other parameters. Complications rates between patients with and without psychiatric comorbidity were compared. A multivariate analysis with binary logistic regression was performed to identify risk factors for complicated course after fall from height.

**Results:** In total 512 patients were admitted, 333 in the AMC and 179 in Liverpool. 178 patients (35%) had a complicated course and 171 patients (33%) were identified to have a psychiatric comorbidity. At the AMC 53 of the 112 patients (47%) with psychiatric disease had a complicated course compared to 68 of the 221 (31%) without psychiatric disease. For Liverpool this difference was greater, 29 of the 59 (49%) versus 28 of the 120 patients (23%). Multivariate analysis showed that psychiatric disease is the strongest statistically significant predictor of complicated course after fall from height (OR 2,026 (95% CI 1,336-3,072)).

**Conclusions:** This study showed that patients with psychiatric disease have a higher risk of complications after fall from height than patients without psychiatric disease. Early recognition of concomitant psychiatric disease might help preventing complicated course in future trauma patients.

## Ben Gardiner

## Gary Sharp

## George Tancock

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# Scientific Program Abstracts

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## WHEN DO YOU ACTIVATE THE MTP?

Ken Harrison

Massive transfusion protocols (MTP) have been shown to both decrease the total blood products given and get appropriate blood products to patients quicker.

I feel a significant reason that they have been shown to achieve this is because they get senior people especially haematologists involved early in the patient's care.

Every institution that I know that has a MTP also has an MTP committee and these committees are regularly reviewing and slightly altering the individual protocols and for some place that now means a slightly different protocol for a trauma MTP activation to an obstetric MTP activation.

If you are in a hospital and the patient is in your hospital, the answer to when do you activate your MTP is when the patient meets the activation criteria in your institution.

What I want to talk about is what do you, as intrahospital health professionals do about pre hospital activation of MTP.

This can occur in 2 ways,

1/ The retrieval team can notify the receiving ED that they request an MTP activation

2/ The patient can be delivered to your ED with an MTP activation and blood products already happening.

## ARTERIAL OR VENOUS GASES – DOES IT MAKE A DIFFERENCE? Bernie Hanrahan

Arterial blood gas analysis is integral to the assessment of critical illness providing information on the aetiology, severity and progress of a disease process.

The clinical validity of substituting venous gas parameters for arterial gas parameters is questionable and has been the subject of several studies and meta-analyses since 2010.

This available recent evidence implies that arterial and venous measurements of pH and, to a lesser extent, Lactate have sufficient statistical agreement to be clinically exchangeable in stable patients as long as some limitations are considered.

Where the patients are cardiovascularly unstable or there is a mixed metabolic respiratory disturbance the mean AV differences for all blood gas parameters but particularly pCO<sub>2</sub> and the derived parameters Bicarbonate and BE become larger and unpredictable with much wider 95% Limits of Agreement (LOA).

A summary of recent findings for individual VBG Vs ABG parameters in recent studies is as follows.

**pH** the mean AV difference was -0.03 and the 95% limit of agreement (LOA) +/- 0.1. Arterial and Venous pH values are clinically interchangeable in stable patients. In unstable patients the pH AV difference varies within reasonably narrow limits.



**Venous pCO<sub>2</sub>** agreement with arterial pCO<sub>2</sub> is poor with mean AV difference of 5 mm but 95% LOA of +/- 20mmHg. None the less recent studies confirm that a venous pCO<sub>2</sub> of less than 45mmHg effectively excludes clinically significant arterial hypercarbia of > 50mmHg.

**Bicarbonate** the mean AV difference was 1.03 mmole/L with 95% LOA +/- 5 mmole/L. This is only close enough to allow the venous bicarbonate value to be used to classify bicarbonate as low, medium or high at best.

**Base Excess** the relationship is unclear with large variability in the few available studies.

**Lactate** the mean AV difference was + 0.25 mmole/L with 95% LOA out to +/- 2.0 mmole/L when unstable patients included in the analysis. Venous lactates can be used to classify lactate as normal or high only. A normal venous lactate probably indicates a normal arterial lactate.

pH remains the most comparable parameter in unstable patients.

Clinically seen venous blood gas values can be used as part of a screen taken together with clinical signs to aid in identifying the sick patients.

Once identified, the clinically unstable patient receiving ongoing management is best guided by arterial blood gas values as venous gases become unreliable.

### **Venous Gas to Triage.**

### **Arterial Gas to Treat**

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## STAFF SAFETY IN THE ER - STRATEGIES

Brian Burns

The resuscitation room in a trauma centre exposes the trauma team to confronting, clinically challenging and psychologically stressful situations. The trauma team is multidisciplinary and composed of multiple professions and backgrounds and prior experiences.

This may result in burnout, compassion fatigue or even PTSD for trauma team members (1). This may be due to a single sentinel case or indeed a more insidious build-up over time with no single trigger. Different team members may interpret a confronting case in different ways. Everyone has their own 'black-box'.

This presentation will outline the following:

How and why this occurs.

How to recognise this in your team members and yourself

Strategies to protect and mitigate against this burnout or PTSD.

### References

1. <https://www.ncbi.nlm.nih.gov/pubmed/23438349>

## WHO NEEDS A PAN CT?

John Kortbeek

**The Choosing wisely recommendation regarding CT scanning will be reviewed and relevant literature summarized including the REACT -2 trial.**

### American College of Surgeons

Released September 4, 2013

**Avoid the routine use of “whole-body” diagnostic computed tomography (CT) scanning in patients with minor or single system trauma.**

Aggressive use of “whole-body” CT scanning improves early diagnosis of injury and may even positively impact survival in polytrauma patients. However, the significance of radiation exposure as well as costs associated with these studies must be considered, especially in patients with low energy mechanisms of injury and absent physical examination findings consistent with major trauma.

**Immediate total-body CT scanning versus conventional imaging and selective CT scanning in patients with severe trauma (REACT-2): a randomised controlled trial.**

Lancet 2016 Aug 13;388(10045):673-83 (ISSN: 1474-547X)

Sierink JC; Treskes K; Edwards MJ; Beuker BJ; den Hartog D; Hohmann

J; Dijkgraaf MG; Luitse JS; Beenen LF; Hollmann MW; Goslings JC

Collective Name: REACT-2 study g

## FAST SCAN IN STABLE BLUNT TRAUMA PATIENTS

Chris Partyka

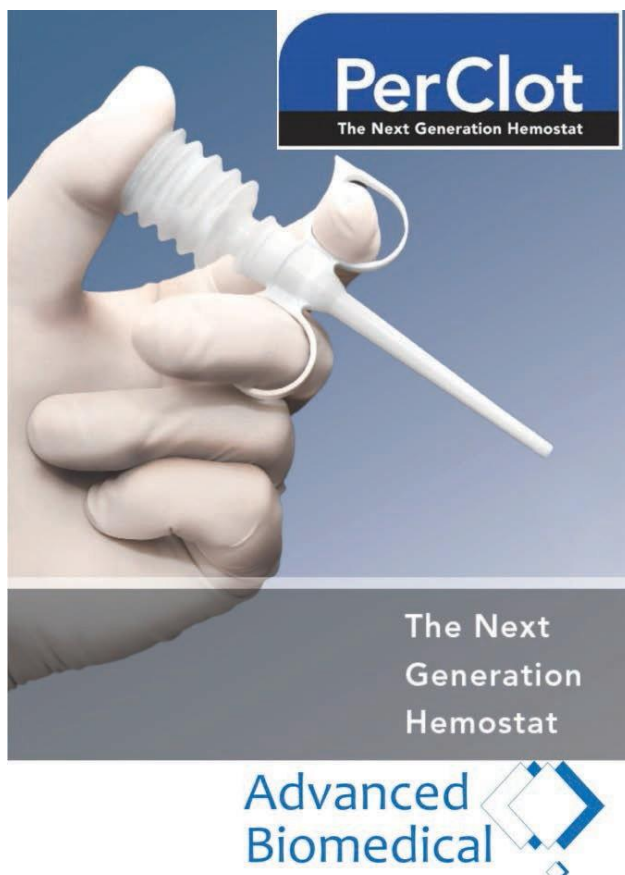
The “*Focussed Assessment with Sonography for Trauma*” scan is the quintessential point of care ultrasound study that saves the lives of unstable trauma patients on a daily basis by expediting their journey to definitive surgical intervention.

In the unstable patient with blunt abdominal trauma, the test characteristics of the FAST scan are impressive (Sn 70-95%, Sp 98-100%). However, in patients with penetrating trauma & in those with stable haemodynamics, this sensitivity falls away to 50% or less. This brings into question whether or not the eFAST still has a role in the bedside assessment of these patients, where advanced imaging with contrast CT provides a greater level of diagnostic accuracy.

A negative FAST scan is not capable of excluding clinically significant injuries in stable, blunt trauma patients, but it is a good screening test. Like all screening tests, the clinician must first develop a pre-test probability for likelihood of injury, based on mechanism of injury, haemodynamics and physical findings. This pre-test probability can then dictate ongoing care, whether that be observation with serial examination and repeat FAST scans, CT imaging or surgical intervention.

A positive scan however, provides vital information to the trauma team. It can predict clinical deterioration and will expedite a patient through radiology or to theatre.

In a country like Australia, with advanced prehospital care and challenging geography, the FAST scan has moved out of the resus bay and over 200 kilometres from major trauma centres. Here, it strengthens clinical assessment, guides interventions but most importantly allows for more accurate communication and preparation prior to patients arrival to the hospital.



## REPAIR OR REMOVE? HIGH GRADE KIDNEY INJURIES

Mike Hunter

In order to answer this question , it is necessary to ask a few more. Context is critical here. Is it blunt or penetrating injury? Is it a single system injury or part of complex management of multiple injury? Is this a planned procedure or encountered in the course of trauma laparotomy? Is angiographic support available in timely fashion?

What are high grade kidney injuries? Most published articles include those of AAST grade IV and V , but some include Grade III. There is general agreement that blunt and penetrating injuries of Grades I –III in haemodynamically stable patients are generally managed very successfully with a non-operative approach with only small numbers requiring subsequent intervention and a nephrectomy rate of around 5-8%. In this presentation high grade will be taken to mean Grades IV and V. With rapid CT scanning and continuing improvement in the quality of imaging the ability to accurately characterize injuries has lifted considerably in the last 2 decades. Along with control of haemorrhage with angio-embolisation this has allowed more cases of Grade IV and V renal injury, both blunt and penetrating, to be managed with non-operative intent. For many patients then, the answer to “Repair or Remove?” is “Neither!”.

The controversy comes with timing of intervention. If one pursues a non-operative treatment course, does failure inevitably mean that nephrectomy is the outcome ? Or should we intervene earlier in specific injuries to repair and salvage some parenchyma and therefore maximize the surviving renal mass, with the expectation of better long term function?

1. Sujenthiran A et al. Is Non-operative Management the Best First-line Option for High Grade Renal Trauma. Systematic Review. European Urology Focus. 2017. *Article in Press*.
2. Nicol A et al. Renal Salvage in Penetrating Kidney Injuries. A Prospective Analysis. J Trauma . 2002 : 53 (2); 351-353
3. Jacobs M et al. Conservative management vs early surgery for high grade pediatric renal trauma. Do nephrectomy rates differ? J Urol .2012: 187; 1817-1822
4. Tasian G et al. Evaluation of renal function after major renal injury: Correlation with AAST Injury Scale.

## PANCREATICODUODENAL TRAUMA – OPERATE OR NOT

Mary Langcake

The origins of damage control (DC) for use in trauma began in an effort to improve survival among exsanguinating patients with combined abdominal vascular and visceral injuries. Over the next 20 years, over 100 indications for application of DC were described. In fact, its use in trauma reached a point where as many as 40% of emergency laparotomies were left open. Much of this was the result of poor resuscitation strategies that were widely adopted during its inception. In 2006, the concept of damage control resuscitation was developed to address the persistence and the lethality of the early coagulopathy of trauma. As damage control resuscitation became increasingly adopted and promoted, mortality rates for DC laparotomy patients and for those receiving massive transfusion fell dramatically, as did the number of patients being left open, or undergoing damage control. This presentation will focus on the current state of DC laparotomy, including its estimated “optimal” rate of application and appropriate indications. In addition, we will discuss current adjuncts to reduce the need to leave patients open and methods of facilitating definitive closure of fascia.

**EXPLORING RETROPERITONEAL HAEMATOMAS****Narain Chotirosniramit**

Retroperitoneal hematoma is generally classified into 3 zones described as Zone 1 midline retroperitoneum, Zone 2 upper lateral retroperitoneum, Zone 3 Pelvic retroperitoneum.

For blunt trauma, Rapid deceleration may cause avulsion of the small branches from major vessels with subsequent hemorrhage. Crush injuries to the abdomen such as lap seat belt or by a posterior blow to the spine also may cause complete disrupt vessel. For penetrating trauma, both from stabbed or gun shot, can cause lateral wall defect or complete transection of the major vessels.

The injured patient with unstable vital sign may be brought to the theater without imagine. The midline abdominal incision is made. A rapid inspection is performed to visualize contained hematomas or area of hemorrhage. Active hemorrhage is controlled by standard techniques of vascular control such as finger pressure, compression, grabbing the perforated artery with a hand or formal proximal and distal control is needed to control bleeding from major artery.

Conversely, if the patient has a contained retroperitoneal hematoma at the time of laparotomy. Hematoma in zone 1 midline retroperitoneum is divided by the transverse mesocolon into supramesocolic region and inframesocolic region, if a hematoma is present in the midline supramesocolic area, the proximal vascular control of the aorta at the hiatus of the diaphragm could be performed by left-sided medial visceral rotation (1) or opening the lesser omentum then retract the stomach and esophagus to the left and digitally separate the muscle fiber of the aortic hiatus of the diaphragm. For the inframesocolic zone 1 hematoma, exposure is obtained by pulling up the transverse colon then open the midline retroperitoneum to identify the infrarenal aorta for proximal control. The alternative choice for proximal control by intraaortic balloon (REBOA) (2) still need more studies. If the hematoma appear to be extensive on the right side of abdomen, injury of the inferior vena cava is suspected, Right medial visceral rotation should be performed.

If hematoma is present in the upper lateral retroperitoneum, most patient with penetrating trauma are explored of the wound track after the ipsilateral renal artery has been controlled (3). For blunt trauma with stable hematoma without sign of expansion should be observed. The pelvic retroperitoneal hematoma presenting after penetrating trauma has to be explored by dividing the midline retroperitoneum over the aortic bifurcation to control proximal common iliac artery then obtained distal control at the external iliac artery just above the inguinal ligament.

1. DeBakey ME, Creech O Jr, Morris GC Jr. Aneurysm of thoracoabdominal aorta involving the celiac superior mesenteric and renal arteries. Report of four cases treated by resection and homograft replacement. *Ann Surg.* 1956;144:549.
2. Sokol KK, Black GE, Shawhan R, et al, Efficacy of a novel fluoroscopy-free endovascular balloon device with pressure release capabilities in the setting of uncontrolled junctional hemorrhage. *J Trauma Acute Care Surg.* 2016 Jun;80(6):907-14.
3. Carroll PR, McAninch JW, Klosterman P, et al. Renovascular trauma: risk assessment, surgical management, and outcome. *J Trauma.* 1990 ; 30 : 547

**PELVIC PACKING OR ANGIO – HAS IT BEEN RESOLVED?**

**Rob Molnar**



### Trauma Training in the Modern Era

Sharon Henry

The Accreditation Council for Graduate Medical Education (ACGME) has a mission “improve the quality of health in the US by ensuring and improving the quality of graduate medical education”

Halstedian principles of surgical education have been the basis of surgical/trauma education and training since the late 1800's. It represented a paternalistic system of patient ownership that required housestaff to commit to a restricted lifestyle spending long hours in the hospital responsible for their patient's welfare around the clock including performing needed procedures. Training was based on contact with professors, sporadic reading, technical and experiential education from the supervised care they provided for their patients. The system depended on self-sacrifice, attentiveness and altruism.

In 1984 following the tragic deaths of Libby Zion and in 1985 and Jewish scholar Yankel Rosenbaum in 1991 in New York, this system of provision of medical trainee education came under national scrutiny. In both cases investigation identified the lack of adequate attending supervision along with long duty hours as contributory to the fatal mistakes that occurred with the management of these two patients. Public outcry led to further investigation by an ad hoc advisory committee chaired by Bertran Bell MD. After hearing from a variety of stakeholders the committee issued a report that was critical of resident duty hours and linked them to the quality of medical care in teaching hospitals. Substantial reform of the system was estimated to require in excess of \$204 million dollars in New York State alone. This led to modifications of the duty hour restrictions recommended by this report. Despite adoption of duty hour restrictions multiple violations were identified by spot surveys. To cement the reality of resident fatigue, a cardiology resident was involved in a fatal car crash after a night of call on his way to take his Board examinations. The ACGME stepped in and made documentation of a programs approach to improving the quality of resident life and education essential elements of accreditation.

Simultaneously technologic advances in medical care have altered our diagnostic and therapeutic approaches to injured patients. CT scans have become ubiquitously available and extensively utilized. This has led to a decrease in the operative cases performed on trauma services. Injuries that were once treated with open surgery are now safely managed non-operatively further decrease the opportunity for trauma trainees to acquire skills through patient contact.

The rise of the internet, availability of computers on handheld devices , social media and the development of medical simulators all represent new platforms to present curricula to a changing audience.

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## EMERGENCY SURGERY

Phil Truskett

This is a wonderful opportunity to reflect. It is interesting for me to note that it is not always level 1 evidence that may be the cause of a paradigm shift in how you practice or view things. I have chosen only one paper that could be considered quantitative<sup>1</sup> and two that are qualitative.<sup>2,3</sup>

The paper by Roland Andersson changed my attitude as to how I considered the management of appendicitis and caused me to question some of my most basic beliefs I had for this condition. In this population based study, Andersson poses the question; does a perforated appendix cause infertility? In this retrospective study he looked at 9480 women who underwent appendicectomy under the age of 15 and compared their long term parity with a control group of 47,590 women. A conceptually simple study. In the appendicitis group 899 women had appendiceal perforation. Andersson demonstrated that the parity in this group was no different to the rest. I think many surgeons live in fear of not operating early on young women with suspected appendicitis in case they perforate and become infertile. This concern is a myth and should not cloud judgement. This caused me to ask are there other myths about appendicitis?

The paper by Carol-Ann Moulton explores the ethics of surgical decision making. She describes 3 different ethical motives for decisions; avowed (patient-centred), unavowed (system-centred) and disavowed (self-centred). Both unavowed and disavowed decisions have negative ethical implications that may only be acknowledged on self-reflection by the decision maker. A measure of one's own professionalism. It may also be recognised by a group of peers. This is a powerful tool.

The final paper by Michael O'Donnell is not really a paper at all; it is an address (level VI). It is an account of his childhood observations of his father's behaviour, a country GP, as he moved from house to house. It is a masterful description of empathy which gives us permission to act when dealing with difficult patient emotions. He informed me that acting is not displaying insincerity but requires practise. It set me on a path to better understanding professional skills.

1. Andersson R, et al "Fertility patterns after appendicectomy: historical cohort study"  
BMJ 1999; 318; 963-967
2. Moulton C, et al "First do no harm: balancing competing priorities in surgical practice"  
Acad. Med. 2012; 87: 1368-1374
3. O'Donnell M, "Doctors as performing artists" J R Soc. Med. 2005; 96: 323-324.

## TRAUMA

John Kortbeek

The research and practice that led to three sentinel papers, which changed care for the injured, will be discussed.

### Damage Control

Rotondo MF, Schwab CW, McGonigal MD, et al.

'Damage control': an approach for improved survival in exsanguinating penetrating abdominal injury.

J Trauma (United States), Sep 1993, 35(3) p375-82; discussion 382-3

### Angio-embolization

Sclafani SJ, Shaftan GW, Scalea TM, et al,

Nonoperative Salvage of computed tomography-diagnosed splenic injuries utilization of angiography for triage and embolization for hemostasis.

J Trauma (United States), Nov 1995, 39(5) p818-25; discussion 826-7

### Use of Ultrasound in Trauma – FAST

Rozycki GS, Ochsner MG, Jaffin JH, et al.

Prospective evaluation of surgeons' use of ultrasound in the evaluation of trauma patients.

J Trauma (United States), Apr 1993, 34(4) p516-26; discussion 526-7

## CRITICAL CARE

Patrick Liston

This is an important topic because in this world we forget history and we subsequently forget why we do certain things.

1. Daily sedation interruption in ventilated patients. This paper by Kress and colleagues in 2000 found that daily interruption led to decreased duration of mechanical ventilation and ICU length of stay. This may be self evident to some but prior to this paper it was difficult to keep patients lightly sedated as it was inconvenient and supposedly dangerous. In fact it is now considered to be more dangerous to keep them heavily sedated. Since the paper there has been a plethora of interest in research and guidelines and we are harming less patients. This has been an example of evidence trumping dogma
2. Top Knife – The art and craft of trauma surgery by Asher Hirshberg and Ken Mattox. This book is not a paper but rather a collection of learned opinion by two giants of trauma surgery. It is the “how to” of damage control surgery written in an engaging style with many practical tips which makes it humorous, insightful and essential reading. It is not just for surgeons and I have found it useful in anaesthesia and intensive so I know what the surgeon will and should do and how I can facilitate that. It is such a popular book that it has had a further four reprints.
3. The SAFE study 2004. This landmark massive Australian ( & NZ) study found no difference in 28day outcome whether saline or albumin was used for resuscitation in ICU. It finally answered the colloid crystalloid question—or did it? It also led to further publications on the subject from data in the trial, became the template for how to run a multicentre trial and cemented the importance of Australian ( &NZ) intensive care medicine on the world stage.

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Kress JP et al Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation NEJM 2000; 342: 1471-7

Hirshberg A & Mattox K Top Knife – the art and craft of trauma surgery.2005

The SAFE study investigators A comparison of albumin and saline for fluid resuscitation in the intensive care unit NEJM 2004;350:2247-56

**SEVERE LOWER GIT BLEEDING – BEST PRACTICE****Andrew Gilmore****ISCHAEMIC MESENTERIC CATASTROPHES****John Crozier**

Delay in diagnosis of acute mesenteric ischemia is the biggest factor that contributes to a continued mortality rate as high as 30% - 70%, and frequently in survivors, short bowel syndrome, despite >50 years of operative intervention.

A number of pathologic conditions can result in acute mesenteric ischemia, which is a vascular and gastroenterologic emergency. These include embolus to a mesenteric vessel (usually the superior mesenteric artery), thrombosis of underlying atherosclerotic disease, abdominal aortic dissection, nonocclusive mesenteric ischemia, interruption of the inferior mesenteric artery blood supply after abdominal aortic aneurysm repair, mesenteric venous thrombosis, and mechanical causes such as volvulus, intussusception, torsion around adhesions, or internal herniae

Principles of optimal multidisciplinary multimodal management include -

- (1) a specific management protocol
- (2) endovascular and/or open surgical revascularization whenever possible
- (3) resection of non-viable small bowel

4 phase CT angiography is the most sensitive (96%) and specific (94%) diagnostic modality

- if an acute occlusion of the superior mesenteric artery (SMA) is diagnosed,

1. The patient is taken to a hybrid operating room, allowing the option of both open and endovascular techniques. Angiography and endovascular treatment is attempted, with access from the groin or the brachial artery, or both, preferably under local anesthesia.
2. After endovascular revascularization, the abdomen is evaluated, and if there is any suspicion of bowel gangrene, a laparotomy is performed; otherwise, close surveillance follows for at least 48 hours. If percutaneous endovascular revascularization fails, laparotomy and hybrid retrograde recanalization of the SMA and stenting, or open revascularization should be undertaken, without delay.
3. Completion angiography, followed by adjunctive endovascular procedures (where necessary), including further aspiration embolectomy of SMA branches, percutaneous transluminal angioplasty/stenting of residual stenosis, thrombolysis of occluded side branches.
4. Second-look angiography or laparotomy, or both, may be necessary, and should be performed liberally.

## MIDDLE OF THE NIGHT OR IN THE LIGHT OF DAY

Mike Hunter

The last four decades have seen a major cultural shift in medicine in general and surgery in particular with regard to the hours worked by doctors, the effects of fatigue on outcomes for patients and the timing of emergency surgery. Teasing out whether operating on acute cases after hours is intrinsically associated with worse outcomes, or whether the observed adverse effects are due to fatigue from extended periods of duty, poor supervision of inadequately experienced trainees or lower standards of anaesthetic, intensive care or postoperative observational care is not easy. In Australia and New Zealand there is undoubtedly a shift to performing fewer operations at night and shifting them to planned interventions in the daytime hours, but this comes with its own problems, including a lesser exposure for trainees so that they are less well prepared for independent consultant practice, and delay of some acute interventions with worsening of the condition. Generally the literature supports the postponement of many acute surgical conditions until daylight hours, but also shows that with appropriate work and rostering practices it is still quite safe to operate in the middle of the night on those patients whose condition demands it, but that ready senior support and attendance is a key element.

1. Williamson A et al. Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally proscribed levels of alcohol intoxication. *Occup Environ Med* 2000;57:649–655
2. Zafar S et al. The Sleepy surgeon: Does night –time surgery for trauma affect mortality outcomes? *The American Journal of Surgery* (2015) 209, 633-639
3. Gaba D and Howard S. Fatigue among clinicians and the safety of patients. *NEJM*. 2002; 347 (16). 1249-1255
4. Van Zaane B et al. Nonelective surgery at night and in-hospital mortality, the EuSOS study. *Eur J Anaesthesiology* : 2015; 32:477-485

## INTERVAL APPENDICECTOMY – THING OF THE PAST

Michael Sugrue

Appendicitis occurs in about 8% of population in their lifetime, with associated morbidity approaching 15%. The condition is simple in 70%, complicated in 25% and 5% have a mass either during initial examination or when examined of under anaesthesia in the OR. The problem with Appendicitis is that all forms of management have a morbidity of 15% and if the appendix is not removed the potential to miss a tumour and recurrent appendicitis

### Aim

This presentation will explore 3 key concepts- early appendicectomy, non-operative management and interval appendectomy (IA) before coming up with a decisive conclusion.

Non-operative management has been increasingly being advocated, but with a recurrence rate of 30% it is unlikely to be the preferred option for the majority of patients. It is really suitable for patients with long history and low inflammatory markers (only about 10% of patients)

Interval appendectomy (IA) is where surgery is deferred or postponed, because the patient has an appendix mass or is temporally unfit for surgery. IA is classically undertaken 6-12 weeks after diagnosis. IA was historically used for patients with a palpable mass/abscess or where initial antibiotic therapy was used in patients not suitable for surgery, usually with tricky comorbidities (ongoing pneumonia, cardiac failure etc.).

Risk of recurrent appendicitis is 10% in those without a planned IA. Some would argue you are better off not playing an elective IA as complications might be less with just observations alone. There are significant

confounding problems making this approach risky. There is about a 1% malignant rate either in the primary mass or a local tumour perforation. Some series have reported mucinous neoplasm in to 29% of those undergoing IA. Missing this will have a very negative oncological impact.

Tailoring management therefore makes sense, identifying the high risk group for recurrence

This requires patients >20 years to have a CT, ensuring there is no identified faecolith or CT signs of cancer. Patients >40years, those with a faecolith, symptoms > 48hours or a WCC >15,000. should have an IA if initially managed conservatively. This presentation will argue however that they should had had an early appendectomy and avoid the challenges of IA!!.

Early surgery has better outcomes. Taking out the appendix early removes the need for IA. Mentula et al in one of the few randomised studies of appendicular mass management found the rate of uneventful recovery was 90% in the laparoscopy group versus 50% in the conservative group. They concluded laparoscopic surgery in experienced hands is safe and feasible first-line treatment for appendiceal abscess. It is associated with fewer re-admissions and fewer additional interventions than conservative treatment with comparable hospital stay. The Oschner Sherrin regimen of antibiotic therapy and measuring and marking on the skin mass dimensions in response to antibiotic therapy is for the medical museum.

However the approach should be tailored by Surgeon's experience. This includes potential need to convert to open surgery and perform a right hemicolectomy if required. Early appendectomy has been shown in systematic reviews to improve outcomes, more cost-effective, less complications, less need for interventional radiology. Currently 75% of UK and 85% of US Surgeons perform IA,. However is one offers optimal early care including early appendectomy interval appendectomy should become a thing of the past.

## Conclusion

The key is Early Appendectomy in nearly all patients, not just in those simple appendicitis but also patients with an appendicular mass. So IA should be a think of the past.

**Reference** Sugrue M, Maier R (Eds.) (2016) Emergency Surgery Performance, Quality and Outcome Consensus Summit-Resource for optimal care of emergency surgery. Donegal, Ireland:. ISBN: 978-0-9926109-9-93

## DECISION MAKING IN ADHESIVE SBO

Phil Truskett

In clinical practice it is common for a different decision to be made to manage the same problem. At times this might reflected unwanted variation due to lack of understanding or insight but often it will reflect the multitude of variable factors that must be taken into account to best serve the patient's needs and wishes. General Surgeons Australia (GSA) have developed a course called Management of Surgical Emergencies (MOSES)<sup>1</sup>, specifically designed to aid in decision making in emergency settings. Within this course there is embedded an algorithm for clinical decision making and another as an approach to intraoperative emergencies.

In this presentation the MOSES algorithm for clinical decision making will be explained. Current best practice for adhesive small bowel obstruction (SBO)<sup>2</sup> will then be run through this algorithm to demonstrate what must be considered in this condition. The literature indicates that an operative intervention rate in the order of 40% is required in SBO. When and if to intervene can be a difficult decision and is likely to be aided by a structured framework using an evidence based approach.

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## **THE OCCULT PNEUMOTHORAX – IRRELEVANT?**

**John Kortbeek**

The incidence, treatment and outcomes associated with occult pneumothorax will be reviewed. The emerging role of ultrasound will be discussed.

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Ouellet JF, Trottier V, Kmet L, et al.

The OPTICC trial: a multi-institutional study of occult pneumothoraces in critical care.

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Blunt traumatic occult pneumothorax is observation safe?—results of a prospective, AAST multicenter study.

J Trauma (United States), May 2011, 70(5) p1019-23; discussion 1023-5

Ball CG, Kirkpatrick AW, Laupland KB, et al.

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J Trauma (United States), Oct 2005, 59(4) p917-24; discussion 924-5

Oveland NP, Lossius HM, Wemmelund K, et al.

Using thoracic ultrasonography to accurately assess pneumothorax progression during positive pressure ventilation: a comparison with CT scanning.

Chest (United States), Feb 01 2013, 143(2) p415-422

## **PREGNANT TRAUMA PATIENT IMAGING**

**Kate Martin**

## **ADVANCED HYBRID ENVIRONMENTS**

**Glen Schlaphoff**

**HAEMONETICS**



Hemostasis analyzer system

**TEG®6s**

Identify and manage bleeding and thrombotic risk.  
Reduce blood product usage.  
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## TRAUMATIC ABDOMINAL WALL DISRUPTIONS

Narain Chotirosniramit

Traumatic abdominal wall disruption associated with blunt injury mechanism is very rare, with an approximate prevalence of 1% in major reported series. (1) The clinical presentation could be traumatic abdominal wall hernia (TAWH) or abdominal evisceration (AE). Diagnosis of TAWH can be difficult and requires a high index of suspicion. Many TAWHs were associated with the victim impacting on angled or curved surfaces/objects. While the mechanism is not fully understood. They were thought to result from simultaneous surge in abdominal pressure and the presence of shearing forces that synergistically lead to the disruption of the abdominal wall musculature and fascial layers. Abdominal evisceration (AE) associated with blunt trauma is less common, with one study reporting an incidence of approximately 1 in 40000 trauma admissions. AEs constitute an extreme form of TAWHs, with the main difference between the two being the amount of force that is focally delivered to the abdominal wall tissues, as well as the anatomic location of the force application (i.e., eviscerations tend to occur at anatomically weak points – the lateral rectus, lower abdomen, and inguinal regions)(2). In TAWH case, further investigation to rule out other intra- and extra-abdominal associated injuries is required. If the patient is hemodynamically stable, a CT scan is the preferred modality for diagnosis of any potential associated injuries. The incidence of associated intra-abdominal injuries among patients with TAWH may be as high as 30%.

Regardless of the presence of any associated injuries, prompt surgical repair of the TAWH and/or AE it is still required (3). Treatment has been controversial. Both mesh and primary repair have been successfully performed for treatment of traumatic hernia. Traditional layered suture repair has a high recurrence rate, with previous studies measuring up to 54% for incisional hernia repair. Mesh repair has a comparatively lower recurrence rate between 15– 30%. Long-term follow-up is needed to ensure that both cosmetic and functional outcomes are satisfactory. It is also important to monitor the patient for the possibility of a recurrent hernia at the injury site

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## ERRORS IN MANAGEMENT OF LIVER TRAUMA

Kenji Inaba

### Introduction

For both blunt and penetrating trauma<sup>1,2</sup>, the liver remains one of the most commonly injured intra-abdominal organs. Over time, a shift towards the non-operative management of liver injuries has occurred<sup>3</sup>. This is particularly true of blunt trauma however, even for penetrating trauma, selective non-operative management is now an acceptable treatment option. As a direct result of this paradigm shift, less than 15% of liver injuries are now managed operatively. Consequently, those that do require operative intervention are often complex injuries, in systemically compromised patients. Adding to the difficulty is our decreasing experience with the operative management of hepatic trauma. As demonstrated in a report by Lucas and Ledgerwood<sup>4</sup>, by the end of their residency, trainees are documenting an average of only 1.2 cases of hepatic hemorrhage control. This skill set is therefore not being adequately developed in our current generation of general surgeons. The purpose of this session therefore, is to provide a practical review of a graded approach to the operative management of hepatic trauma for the practicing general surgeon taking trauma call.

### Low Grade

Simple AAST-OIS Grade I or II injuries are often found on preoperative imaging with CT or at the time of operation and are rarely themselves the indication for laparotomy. In these patients, as for all grades of injury, the liver should be initially packed. This should be done carefully above and below to prevent further tearing. The immediate focus should then be the big picture, ensuring the balanced resuscitation of the patient as a whole. This will prevent these minor injuries from spiraling into an uncontrollable problem. Minor liver injuries can be left packed until the remaining more pressing intra-abdominal and thoracic injuries are temporized and by the time the packs are removed, many will have stopped on their own. For those that have not, a combination of hemostatic maneuvers can be utilized. These include suturing (traditionally, mattress using a large blunt suture such as an 0 Chromic BP-1 Taper), taking care to avoid ripping through the parenchyma, and the use of local hemostatic agents. Many local hemostatic agents are commercially available. However, in general, liquid formulations whether synthetic or Fibrin based, do not perform well in this situation due to an inability to adhere to the bloody liver surface. More effective are the cellulose based fibers that can be directly placed upon the bleeding tissue or sutured into the wound. If Argon Beam coagulation is immediately accessible, this can also be used however practically, for these types of injuries, Electrocautery is sufficient. Efforts should be made to stop all visible bleeding and biliary ductal leak in order to prevent hematoma or biloma formation postoperatively. Although the vast majority of these can be diagnosed post-operatively with CT and treated effectively with percutaneous drainage or endoscopic retrograde stenting, prevention is preferred. Routine drainage is not required. Any fragments of liver likely to become ischemic should be resected however, anatomic segmental resection is not required. The general principle is to remove only what is necessary. Whenever possible, reconstruction of the normal architecture of the liver parenchyma should be performed as the opposition of tissue will facilitate hemostasis. Any large defects can be effectively bridged with omentum.

### High Grade

For higher grade injuries, the potential for an adverse outcome increases with increasing injury grade, burden of associated injury and physiologic derangement of the patient. The critical first step is to identify those patients that will not tolerate definitive management of their liver injury and to proceed directly to Damage Control if this is the case. In these patients, in addition to controlling contamination from any injured GI tract and other

sources of bleeding, the liver should be packed. No attempt should be made to take down the peri-hepatic ligaments as this natural shell facilitates the packing process. Packs should be applied above and below the liver carefully so as to not cause further damage. Any obvious sources of major bleeding if directly accessible can be sutured or clipped, but only if easily accomplished. Prior to placing the packing, a sheet of Vicryl mesh laid upon the injured liver as a barrier between the injured hepatic surface and packs will facilitate pack removal once the patient is resuscitated and brought back to the OR for pack removal. Plastic sheeting has been recommended in the past however, our experience is that plastic, unlike vicryl, prevents contact hemostasis and allows slippage of the packing. Once the decision to proceed to Damage Control packing is made, if available, the angiography team should be notified to mitigate any delay in set up time. Ideally, angiography is performed in a hybrid OR or, if unavailable, in the angiography suite accompanied by the surgical and critical care teams. Several uncontrolled series have demonstrated that more than half of these patients will have bleeding at the time of angiography that can be controlled using endovascular techniques<sup>5,6</sup>. From here, the patient will proceed to the ICU for continued resuscitation.

In virtually all cases, hepatic packing remains the damage control option of choice. In cases where there is severe disruption of the hepatic architecture however, it may not be possible to control the bleeding with direct packing. This is often the case if there is a juxtahepatic venous injury. In general, even for juxtahepatic venous injuries, the preferred treatment option remains packing<sup>7</sup>. If however this does not control the bleeding, several adjuncts should be considered. First, inflow control can be achieved using the Pringle maneuver. This can be done with either a clamp, or, with a vessel loop and Rummel tourniquet which may cause less collateral damage to surrounding structures. If this decreases the bleeding sufficiently to allow direct visualization of the bleeding area, attempts at suture control can be made. If application of the Pringle stops the bleeding, but the bleeding cannot be definitively controlled surgically, selective hepatic artery ligation has been described in the past as a lifesaving manoeuvre. In this era of Damage Control however, leaving the Pringle on as part of the Damage Control process with the intra-operative use of angiographic embolization may be preferable to permanent hepatic artery ligation with its potential for ischemic necrosis.

Several additional considerations may facilitate hemorrhage control. Exposure can be improved by the addition of a right subcostal incision and taking down any hepatic ligaments not disrupted by the initial injury. If the injury is deep within the parenchyma, any obstructing tissue can be finger fractured away to expose the bleeding sources. For gunshot wounds traversing the center of the liver, simply closing the entrance and exit holes will not work. One option is to apply balloon tamponade and several examples of this will be illustrated during the course. If however the tract is sufficiently close to the edge of the liver, the shortest radian to the edge can be scored using Electrocautery and a tractotomy through the parenchyma performed using blunt finger dissection, linear staplers or the LigaSure to expose the bleeding sources within the tract.

If however despite these maneuvers the bleeding cannot be stopped, total hepatic vascular isolation should be considered. This is often the case with uncontained juxta-hepatic venous injuries. The infra-hepatic IVC can be easily controlled, which together with the Pringle, will control the majority of the inflow. In order to prevent GI tract edema, abdominal aortic inflow control should also be obtained. Above the liver, although intra-abdominal supra-hepatic Vena Cava control has been described, in practice this is exceedingly challenging due to anatomic space constraints and the fact that this is commonly the source of bleeding. Even if not, local hematoma makes visualization difficult. Two practical approaches to the supra-hepatic Vena Cava can be taken. If the patient has undergone a right thoracotomy, (often due to a massive hemothorax from a gunshot wound that crosses the diaphragm and causes a juxtahepatic venous injury decompressing into the chest), the diaphragm can be taken down, leaving a cuff for reconstruction. This then exposes the pericardium and the entire peri-hepatic region allowing control of the intra-pericardial Vena Cava and direct access to the liver for repair. Alternatively, if a thoracotomy was not performed, a sternotomy can be used to expose the intra-pericardial Vena Cava and improve exposure to the retrohepatic region. A trans-diaphragmatic sub-xiphoid approach has also been described however this will not provide the enhanced view required to facilitate repair that a thoracotomy or sternotomy does. Although not ideal, controlling the vascular supply to the liver may be the only possible way to visualize and control bleeding in what is usually a major complex parenchymal disruption or a juxtahepatic vascular injury. For the sake of completion, the A-C or Shrock shunt will also be discussed during the case as will the limited worldwide experience with transplantation for trauma.

## AAST-OIS LIVER

Grade I Hematoma	Subcapsular, <10% Surface Area
	Laceration      Capsular Tear, <1cm Parenchymal Depth
Grade II	Hematoma      Subcapsular, 10-50% Surface Area; Intraparenchymal, <10cm Diameter
	Laceration      1-3cm Parenchymal Depth, <10cm Length
Grade III	Hematoma      Subcapsular, >50% Surface Area or Expanding; Ruptured Subcapsular or Parenchymal Hematoma
	Laceration      >3cm Parenchymal Depth
Grade IV	Hematoma      Parenchymal Disruption Involving 25-75% of Hepatic Lobe or 1-3 Couinaud Segments Within a Single Lobe
Grade V	Laceration      Parenchymal Disruption Involving >75% of Hepatic Lobe or >3 Couinaud Segments Within a Single Lobe
	Vascular      Juxtahepatic Venous Injuries; Retrohepatic Vena Cava/Central Major Hepatic Vein
Grade VI	Hepatic Avulsion

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## **THE ROLE OF LAPAROSCOPY IN THE ACUTE ABDOMEN**

**Paul Lambrakis**

## **ACUTE CHOLECYSTITIS – BEST PRACTICE**

**Ailene Fitzgerald**



Optimising outcomes from General Surgery laparotomy requires an organised meticulous approach. A bundle including emergency pre-habilitation, optimising glucose; iv fluid are important. Per-operate determination of the cause is crucial including whether its sepsis, non-traumatic intra-peritoneal haemorrhage or bowel obstruction for example. Reviewing old interventions including surgery will help reduce the unexpected including gossybioma. Identification of sepsis is vital to ensure early administration of antibiotics (1)

**Aim** This paper will explore a preferred approach and tips and traps to avoid (2).

## Learning Points

Firstly presentation is based on probabilities fashioned by detailed history and physical examination. Timely appropriate laboratory investigations are essential. Remembering there is no reliable marker for ischemia- A normal lactate occurs in 25% of mesenteric cases. Minimizing surgical insult is important. So a minimal invasive approach is definitely better for patients with appendicitis and perforated ulcer- at least an initial laparoscopic approach ( there is no error in conversion to open)

## Avoid

Appendicitis	A laparotomy in kids with peritonitis
Cholecystitis	Long standing pain >3/52 Pt needs a CT as they may have a cancer
Pancreatitis	Always check Amylase- if in doubt do an early CT
Perforated Ulcer	Don't do a plain abdomen xray- wont see free air
GI bleeding	Hb is the give away- Always reverse anticoagulant
Bowel Obstruction	Make sure you do a PR
Obstructed incisional hernia	Beware there is not an underlying cancer precipitating the obs.
Diverticulitis	Remember torsion of appendix epiploicae does not need laparotomy
Mesenteric Ischaemia	you don't think of it – especially in the elderly you will be surprised
Septic Shock in Emergency; ICU	Avoid blind laparotomy; Use laparoscopy to help site incision

A prompt investigative pathway with Abdominal CT is really essential. The exception is the patient in septic shock who need to be in the OR within 2 hours where a CT may delay sepsis source control. Oral contrast is not required and IV contrast can be given safely to vast majority of patients. Meckel's diverticulum and right sided caecal diverticulum may mimic appendicitis and should be diagnosed on CT. In select patients point of care or departmental US may help

**Conclusions** Careful planning will ensure there are very few unexpected findings at laparotomy. Abdominal CT scanning ( if promptly available ) is generally going to minimize surprises and ensure patient is well informed and prepared.

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## MANAGEMENT OF COMPLEX WOUNDS

Sharon Henry

The general, trauma or acute care surgery is likely to encounter complex wounds in a variety of clinical contexts. A definition is useful to frame the discussion. Despite the common usage of the term a precise characterization is illusive. Commonly multiple tissue types/levels are effected. Wound size and location may impact complexity as well. Finally systemic patient factors influence both the development a wound and the trajectory of its healing and therefore may independently define the characterization of a wound as complex.

### Etiology

Trauma both penetrating and blunt can frequently produce injury to all tissue types from skin to bone. Trauma more commonly involves the young and healthy so the classification of a wound as complex usually results from the magnitude of tissue injury. Common examples include high grade open extremity factures Gustilo III (A-C), mangled extremities or severe craniofacial trauma with tissue devitalization or loss. These reconstructions require specialist care.

Morel-Lavallee injury is one that may be diagnosed and managed by the emergency/trauma/acute care surgeon. This lesion was described by Maurice More-Lavallee in 1863 in a patient injured after falling from a moving train. The patient developed a post traumatic fluid collection over the region of the greater trochanter. It is a closed degloving injury that follows direct trauma or shearing force to pelvis thigh or knee (less commonly gluteal and lumbar sacral). A disruption of the subcutaneous fascia from the underlying fascia results in a hemolympathic fluid collection and may ultimately cause devitalization of the skin and subcutaneous tissue as perforating arteries and veins are disrupted. Furthermore even when necrosis does not result the closed space collection is at risk of secondary infection.

Tissue crush injury or compressive syndrome has the potential to produce a complex wound. Crush injuries can result from blunt trauma, explosions, structural collapse. Crush injury is caused by injury from a heavy object causing muscle and tissue injury. Compressive syndrome results from muscle injury due to slow compression of muscle groups leading to ischemic damage. These injuries may also be accompanied by rhabdomyolysis with its systemic manifestations.

Surgical site infections and surgical wound dehiscences offer the potential to become complex wounds. Severe soft tissue infection often treated with wide surgical debridement frequently result in large sized wounds that may involve multiple tissue layers. Diagnostic delays are common in the case of necrotizing soft tissue infection (NSTI) and potentially result in larger tissue loss.

### Systemic Factors

A variety of factors impact wound healing and can increase the complexity of a wound and its management. A list of some of those factors is below

Diabetes Mellitus
Vascular Disease
Malnutrition
Immunosuppression
Alcoholism
Advanced age
Obesity
Radiation
Paralysis
Non compliance
Cirrhosis
Chronic kidney Disease
Genetic disorders
Autoimmune diseases

## Treatment

Treatment is begun after a thorough assessment of local and systemic factors that may impact wound progression or healing. Systemic disease should be maximally treated to mitigate any potential effect on wound healing. Infection is a common etiology and potential complication of complex wounds. Wounds generally require inspection in the operating room where a complete assessment is performed. Devitalized tissue and foreign bodies are removed. Large volume irrigation can be useful to help decrease bacterial burden through dilution. Bear in mind that high pressure irrigation (70 psi) may be damaging to tissues, imbed infection or more deeply and produce air emboli. Risk and benefit must be weighed with its use. Pressure irrigation over exposed blood vessels, nerves and bone can potentially injury tissue or cause bleeding. While pressure that is too low (<4 psi) can fail to remove debris and exudate. Several fluid options are available for the lavage.

Wound cleanser	Promotes wound healing	Antimicrobial effect	Toxicity in vitro
Acetic Acid	No	Yes	Yes
Alcohol	No	Yes	Yes
Hydrogen peroxide	No	Yes	Yes
Polyhexanide/betadine	Yes	Yes	Low toxicity
Povidone-iodine	Yes	Yes	Yes
Saline	No		
Ionized silver	Yes	Yes	Yes
Sodium hypochlorite	No	Yes	Yes
Chlorhexidine gluconate (0.05%)	No	Yes	No
Hypochlorous Acid	No	Yes	No

## Reconstruction

Reconstruction is attempted only after the wound is determined to be well vascularized and free of excess bioburden. This may require repeated operative inspections, debridements and washouts. Under the best circumstance delayed closure with residual tissue is possible. When this case does not exist a variety of options are available to choose from. The optimal method depends upon the both local and systemic factors.

Free flaps

Tissue

Expansion

Distant flaps

Local flaps

Dermal matrices

Skin graft

Negative pressure wound therapy

Closure by secondary intention

Primary closure

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## **PROLONGED ILEUS – TRICKS AND STRATEGIES**

**Mike Hunter**

Adynamic ileus, usually postoperative, refers to the disruption of the normal coordinated activity of the gastrointestinal tract . It is very unpleasant for patients, producing symptoms of distension , increased pain, nausea, sometimes vomiting and the need for a nasogastric tube, as well as the sequestering of quite large volumes of fluid which may need significant quantities of IV replacement to maintain organ perfusion and delaying the resumption of adequate nutrition. It prolongs length of stay , is associated with other adverse outcomes and significantly increases costs.

Ileus appears to be predominantly due to dysfunction of the myenteric plexus of the bowel particularly related to pro-inflammatory leucocyte and macrophage activation and infiltration and is made worse by opioids, fluid overload and intraperitoneal infection or other inflammatory stimulus.

Preventive strategies of some value include minimizing bowel handling and exposure, avoiding prophylactic nasogastric drainage and encouraging early feeding, and avoidance of opioids where possible. More controversial are the use of chewing gum and alvimopan. Once established , ileus is difficult to treat effectively. Draining /removing sources of infection and ensuring electrolyte abnormalities are corrected (particularly hypokalaemia) are first steps but beyond that very few of the measures tried have proved to have meaningful clinical benefits. If gastric emptying can be improved with prokinetic agents such as metoclopramide or erythromycin, then enteral feeding is often still possible into a small bowel which is not moving normally, but most often patience is required until the condition resolves itself.

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## **STOMAS – THE GOOD, THE BAD AND THE UGLY**

**Andrew Gilmore**

## **SLEEP DISTURBANCES IN THE ICU**

**Bryan Cotton**

Sleep in the ICU is most often associated with repeated arousals throughout the day and night, which disrupt sleep continuity and quality. Most sleep experienced by ICU patients occurs during the daytime, which, unfortunately, lacks both delta wave (or deep sleep) and REM sleep. Reasons for loss of sleep, both quantity and quality, can be both internal (pain, discomfort, anxiety) and external (noise, light). Light disturbances result from an absence of diurnal light cycles and can lead to cognitive disturbances and ICU-delirium. Noise also significantly disturbs sleep, with staff communications being the most disruptive. Unfortunately, ICU-staff and monitor noise does not improve after 11 pm. In addition, many of the medications used in the ICU are known to disturb sleep. Anti-hypertensives affect sleep through daytime somnolence and deep sleep disturbances. While benzodiazepines suppress sleep stages 3 & 4, opiates suppress REM sleep. Consequences of sleep deprivation include increased seizure potential, increased energy expenditure, suppress antibody and cell-mediated responses, impair ventilator weaning, and lead to increased blood pressure and arrhythmias. Non-pharmacologic options to improve sleep quality include acoustic modifications to ICU structure (lots of windows, sliding doors), minimizing nighttime conversations, placing alarms outside room, and scheduling lab draws and radiographs, as well as baths/linen changes, to not interfere with sleep. The ideal pharmacologic option would have a short half-life, minimal drug-drug interactions, few cardiopulmonary effects, and maintain sleep architecture.

## **WHO NEEDS AN ICP MONITOR?**

**Renata Bazina**

ICP monitoring continues to be recommended, the indications have not changed

ICP monitoring for patients with a severe head injury, GCS  $\leq$  8 after resuscitation and abnormal admission CT scan.

ICP monitoring for patients with severe head injury GCS  $\leq$  8 with normal CT scan if 2 or more of following apply: age  $>40$ , motor posturing, SBP  $<90$  mmHg.

Treatment based on data may provide better outcomes than clinical assessment alone.

### **Reference**

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## **TRAINING TRAUMA ANAESTHETISTS**

**Chris Bleeker**

Trauma anaesthetists are a rare species, especially dedicated trauma anaesthetists. This reflects the low occurrence rates of trauma.

Trauma anaesthesia can be characterised as a combination of all anaesthesia sub specialties presenting in very acute setting requiring a specific approach.

Training for trauma is usually found in the large trauma centres. The curriculum is mainly based on treating trauma patients and then maintaining this experience. Retention of skills is a problem in most western countries

Training for trauma requires a combined training together with the entire trauma team. This training should include a theoretical part and a practical part enhancing the different skills required for the trauma anaesthetist. Useful training can be cadaver and life tissue training based. It should cover the team approach to trauma. This should be followed by a posting in a high volume trauma centre.

**DAILY CXR – CLINICAL RELEVANCE****Kenji Inaba****Background**

Of all patient care areas in the hospital, the Intensive Care Unit remains one of the most challenging for the practicing surgeon. The patients are critically ill with multiple ongoing issues, require the active treatment or support of several core organ systems concurrently, utilizing costly and complicated medications and devices with a narrow margin for error. The clinical team must be able to assess and treat dozens of these complex patients at once, ensuring compliance with the best evidence based therapies, a standard that is continuously changing with active research being performed on multiple fronts. In order to facilitate the management of this wide array of patients, many aspects of care have been automated, in order to ensure uniformity of treatment, and to ensure that critical diagnostic and treatment elements are not left out. While protocols such as those used to titrate an insulin infusion for example have been validated to be safe and effective for improving workflow, others like the requirement for a daily CXR have not.

In upwards of a third of ICUs across North America, the daily CXR is an automatic part of the admission order set, with proponents advocating the earlier diagnosis of pneumonias and pneumothoraces, the placement of tubes and lines, fluid status evaluations and logistic simplicity of imaging everyone overnight rather than during the busy daytime hours as the reasons why it is essential. At our institution, a long standing protocol to obtain a daily CXR on all patients in the Surgical ICU sometime between midnight and 0500 was in place. In 2010 a new protocol to stop this practice was introduced and the impact on patient outcomes assessed. The elimination of the automatic CXR not only decreased the number of X-rays obtained, along with its net benefit in terms of resource utilization and radiation burden, but caused no deterioration in length of stay, complication rate or death. By relying on physician directed ordering of CXRs the diagnostic yield of the CXR increased while decreasing the number of clinically irrelevant studies. Obtaining a CXR in the ICU setting should be individualized in order to maximize yield while minimizing radiation burden and cost.

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## TRACHEOSTOMY – WHEN AND WHY?

Patrick Liston

I will talk about the use of tracheostomy for the ICU patient needing prolonged mechanical ventilation. For these types of patients tracheostomy allows for avoidance of the complications of prolonged endotracheal intubation and the advantages of patient comfort, easier and safer ventilatory weaning, less sedation and easier transition to the ward.

Tracheostomy is generally performed on those who are unable to be weaned within one to 3 weeks of ventilation. Unfortunately the data is insufficient to show clear benefit of early tracheostomy (within four days) in ventilated ICU patients and it does expose some patients to an unnecessary procedure. Therefore the decision should be on a case by case basis. This decision making should take into account the injury burden, the likelihood of weaning, the likelihood of survival and functional outcome. The optimum timing would be based on the other medical and surgical issues that may make the tracheostomy less safe and we would wait until such issues had resolved. For example patients with raised ICP or high Fio2 or high levels of ventilatory support may have their tracheostomy deferred until these problems have resolved.

There are logistical advantages, in appropriately selected patients, to the performing the tracheostomy percutaneously at the bedside in the ICU. There may also be advantages in infection rates but the long term results are equivalent to surgical tracheostomies. As a result we use the percutaneous dilational technique utilising the fiberoptic bronchoscope and ultrasound to aid in positioning of the needle. In certain circumstances the surgical approach in the OT is preferred such as unfavourable anatomy, the need for regular returns to OT for surgery, the need for a tracheostomy for surgical reasons such as facial fractures, cervical spine instability, problematic ventilation or coagulation problems.

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## **GREAT DEBATE**

### **Malcolm Turnbull Would Make A Better Trauma Surgeon Than Donald Trump**

**A Giles Vs M Sugrue**

## **GREAT DEBATE**

### **All Grade 3 Plus Splenic Injuries Must Be Embolised**

**K Inaba Vs J Kortbeek**

## **BLUNT SOLID ORGAN INJURIES**

**Kenji Inaba**

The non-operative management of solid organ injury after blunt trauma was first described in the pediatric patient population. It has been adapted for use in adults and remains to this day the contemporary standard of care, applicable to all three of the major solid organs – liver, kidneys and spleen. When successful, it has the benefit of preserving organ function, decreasing surgical burden and if there are no hollow viscus injuries, decreasing the non-therapeutic laparotomy rate. Several technological advancements have improved our ability to safely pursue non-operative management, including CT for defining the extent of the injury and associated injuries as well as IR intervention for detailed imaging and acute embolization. The failure rate likewise has been improved by the ability of CT to image and characterize complications and the availability of IR to drain or stent the cause. The injury grade, amount of intra-peritoneal blood, presence of contrast extravasation and increasing age have been demonstrated to predict failure, however none of these are strict contraindications to non-operative management. Patients who are hemodynamically unstable and do not respond to initial attempts at resuscitation are not candidates for non-operative management. Those with a traumatic brain injury who would not tolerate hypotension or who are Jehovah's Witness patients must have individualized treatment. For those who have another indication for laparotomy, the injured organ can be assessed intra-operatively, with organ salvage or removal depending on the intra-operative findings. The need for blood transfusion by itself is not a strict contraindication to non-operative management however, any patient requiring transfusion should be considered for IR diagnosis with possible embolization. Regardless of the need for transfusion, all patients with a solid organ injury being managed non-operatively should have their coagulation status monitored and corrected, and a type and screen be sent to the blood bank in preparation for transfusion if required. These patients undergoing non-operative management should be placed in a closely monitored setting.

## **SPLEEN EMBOLIZATION**

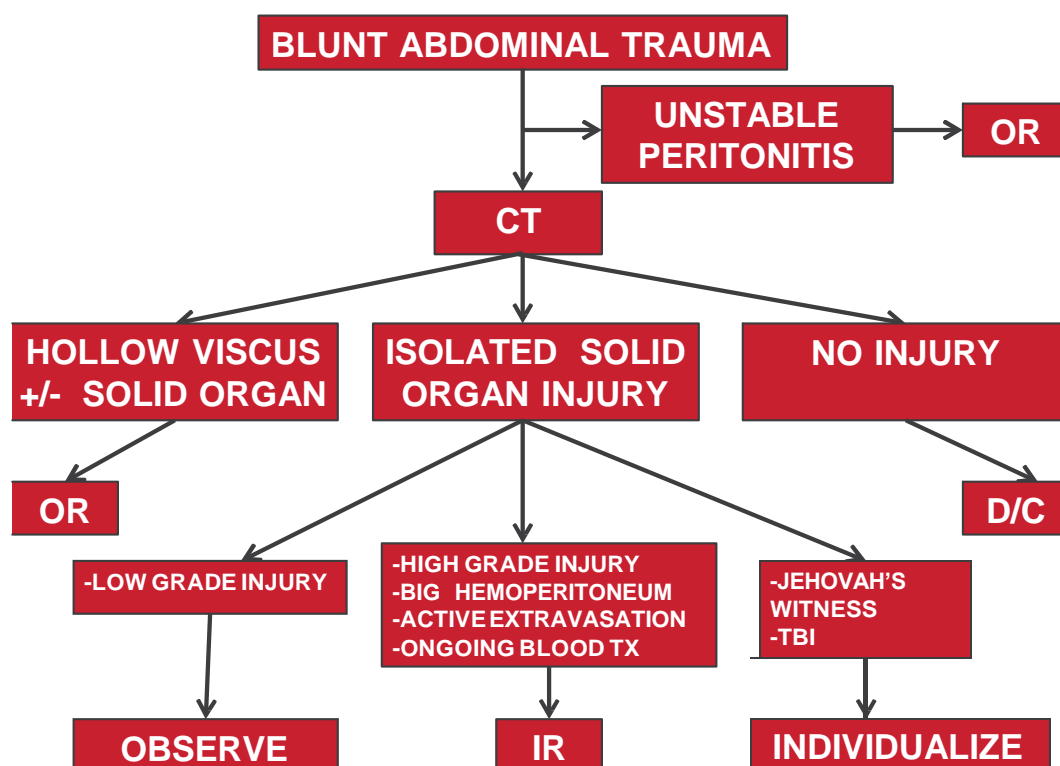
The injured spleen in particular is a highly vascular organ with a weak capsule, and is prone to injury. Definitive management of the severely injured spleen can be obtained with splenectomy however this entails an operation, and loss of the immune capacity of this solid organ. Angioembolization (AE) is an adjunctive treatment that can aid in the non-operative management of these injuries. While there is significant variation in North America in the availability and timely access to AE, applied to high (III-V) grade injuries, it has been demonstrated to be a strong predictor of successful Non-Operative Management. AE should not be considered in general for patients who are unstable or with other known intra-abdominal injuries requiring laparotomy, and should be carefully considered in patient subsets such as the Jehova's Witness where rescue transfusion on blood products may not be possible. Those patients who present hemodynamically stable, with either CT evidence of extravasation or vascular malformation, or those with ongoing clinical blood product transfusion requirements will benefit the most. To be most effective, AE should be carried out rapidly. The benefits of a proximal versus selective route of embolization remains controversial.

## **AAST SPLEEN Injury Scale**

I-Hematoma	Subcapsular, <10%
I-Laceration	Capsule <1cm
II-Hematoma	Subcapsular 10-50% or intraparenchymal <5cm
II-Laceration	Capsule 1-3cm, no trabecular vessels
III-Hematoma	Subcapsular >50% or expanding/ruptured or intraparenchymal >5cm
III-Laceration	>3cm parenchymal depth or trabecular vessels
IV-Laceration	Segmental or hilar vessels with devascularization >25%
V-Laceration	Shattered spleen
V-ascular	Hilar vascular injury with devascularization of spleen

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## NOTES

**Save the date**

# SWAN 2018

**TRAUMA, CRITICAL CARE &  
EMERGENCY SURGERY CONFERENCE**

**27<sup>th</sup> and 28<sup>th</sup> July 2018**

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**Venue: Sydney CBD Hotel to be confirmed**



