

TRAUMA SURGERY

**TS01
SINGLE VEHICLE ROLL OVER ACCIDENTS: AN UNIQUE
PATTERN OF MOTOR VEHICLE ACCIDENTS IN
CENTRAL AUSTRALIA**

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The single vehicle rollover accident is a highly complex crash mode and there is growing concerns about its incidents and consequences in central Australia. The aim of this paper is to assess:

- 1 The incidence and injury patterns of rollover accidents
- 2 Pre rollover characteristics on rollover propensity
- 3 The injury severity and outcome of rollover accidents

The absence of speed limit, unfenced roads, vast distances traveled, unsealed roads and high use of alcohol makes the spectrum of MVA's in NT unique.

In this two year period of study from Jan 2004 – Dec 2005, there were 470 motor vehicle accidents of which 126 were single vehicle rollover accidents. 132 patients were admitted; 73 NT residents of which 45 were of aboriginal origin and 14 were international tourists. There were 37 deaths in Central Australian roads and 20 were due to single vehicle rollover accidents. None of the deaths occurred at the Alice Springs hospital. Most rollover accidents occur at a speed above 100 km/h. 24 patients had an ISS > 15 and 35% of all injuries were to head, neck and shoulder. Rollovers occurred when the vehicle left the road way and encountered a tripping mechanism such as soft dirt or loose gravel. Those who were belted fared better than those unbelted occupants. Completely ejected occupants were all unbelted. Mean time to hospital from time of accident was 8Hrs. Primary prevention strategies need to involve remote communities, tourists traveling in central Australia and address alcohol and restraint use.

**TS02
MANAGEMENT OF FLAIL CHEST IN TRAUMA:
ANALYSIS OF RISK FACTORS AFFECTING OUTCOME**

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Background Flail chest in thoracic trauma is associated with significant complications and carries high morbidity and mortality. At present there is no standardized management plan for flail chest. The aim of this study was to determine the risk factors affecting morbidity, mortality, and length of stay in the hospital.

Methods We evaluated all patients admitted to our trauma centre between January 2002 and December 2004. Age, presence of pneumothorax, trauma severity score (ISS), length of stay, lung contusion and deaths were recorded.

Results There were 100 patients with a mean age of 52 (SD 19.8, range 17–90). The median length of stay was 17 days, and the average ISS score was 30 (SD 13.2). 74% had flail chest and lung contusion, 2 patients had pneumothorax, and 7 (7%) patients died. 3 (5.4%) patients with 1–4 fractured ribs died, compared with 4 (8.9%) patients with 5 or more fractured ribs ($p = 0.70$, Fisher's exact test). The mean ISS score was 32.3 (SD 19.5) for those who died compared with 29.8 (SD 12.7) in those who did not die ($p = 0.63$, t-test). There was a moderate positive correlation between ISS score and length of stay ($r = 0.36$, $p = 0.0002$, Pearson correlation coefficient).

Conclusion ISS score was found to be a moderate potential predictor on outcome regarding length of stay in the hospital. There is an apparent increased risk of death with more fractured ribs and therefore a standardised surgical management plan for ribs fixation may reduce the risk of death in this patient group.

**TS03
RETROHEPATIC VENA CAVA INJURY REMAINS A CHALLENGE
TO TRAUMA SURGEONS**

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Although uncommon, and despite the modern in diagnostic tools and therapeutic alternatives, retrohepatic and main hepatic veins injury remains associated with high mortality rate. Preoperative diagnosis is uncommon, and bullet trajectory may be a helpful sign in penetrating trauma patients.

Patients and Methods Hospital records of patients sustaining retrohepatic vena cava (RHVC) injury were retrospectively reviewed as to diagnosis, associated injuries, injury characteristics, surgical management, and outcome, last ten years.

Results Eight male, 17 to 45 (mean 27.5) years-old patients sustaining RHVC injury were reviewed. Mean trauma indexes for the 8 cases were: ISS 36.6, RTS 7.55 and TRISS 89.0; and for the group who died: ISS 41.6, RTS 7.18, and TRISS 80.5. Two patients had sustained blunt trauma (one died), and six had penetrating injuries (two died). The injury diagnosis was achieved during surgery in all cases. A transfixing RHV injury occurred in 4 (50% of the) patients, and was found in all the 3 patients who died. An atriocaval shunt was employed in four patients, 3 of them had with transfixing injury with two deaths. The number of associated injuries was higher in the patients who died. Overall mortality rate was 37.5%.

Comments Despite advances in image diagnosis, injuries to RHVC are frequently diagnosed during surgery. Tangential injuries were managed with direct approach and sutures, and to control bleeding in transfixing injuries, were managed with atriocaval shunts, before suture.

Conclusion Despite improvements in its diagnosis and management, RHVC injuries remain with a high mortality rate, mainly when transfixing, and associated with numerous associated injuries.

**TS04
THE EPIDEMIOLOGY OF PELVIC FRACTURES:
THE WHOLE PICTURE**

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Purpose The comprehensive description of the epidemiology of pelvic ring fractures (PRF) including high-energy PRF, low-energy PRF and those who die during the prehospital phase (pre-H).

Methods 12-month prospective population based study was performed in a trauma system with one Level-1 trauma centre and seven referring hospitals (population: 0.6 million). Data were collected on all PRF from the trauma system including high-energy, low energy fractures and pre-H deaths with PRF. Patient demographics, injury severity score (ISS), mortality (%) and PRF-related mortality were recorded prospectively. All high-energy deaths had autopsy at the same forensic pathology department. Data presented as percentages (%) or mean \pm SEM.

Results During the 12-month period 138 patients suffered PRF (45% male, 59 \pm 2 years, ISS 20 \pm 2, 21% mortality and 8% PRF-related mortality). Sixty-four % of the low-energy and 92% of the high-energy patients were transferred directly to the trauma center. There were 57 high-energy (71% male, 41 \pm 3 years, ISS 23 \pm 3, 14% mortality, 7% PRF-related mortality) 63 low-energy (20% male, 81 \pm 1 years, ISS 6 \pm 1, 5% mortality, 2% PRF-related mortality) and 18 pre-H died patients with PRF (47% male, 41 \pm 6 years, ISS 61 \pm 4, 100% mortality, 33% PRF-related mortality). PRF-related mortality was always due to bleeding.

Conclusions The majority of PRF-related mortality occurs pre-H. Half of the multiple-injured high-energy PRF patients still die because of the pelvic bleeding. Further preventive measures and optimization of the care of PRF patients is required. Trauma centre admission of 2/3 of the low-energy PRF is a significant load and should be further investigated in an inclusive trauma system.

TS05 WHOLE-BODY MULTISLICE CT-SCANNING AS PRIMARY IMAGING TOOL IN THE EMERGENCY MANAGEMENT OF SEVERE TRAUMA

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Aim Whole-body multislice CT-Scanning (MSCT) has become the primary imaging device in many European and North American trauma centres. We aim to present a new standardised protocol that has led to a markedly improved diagnostic management in an Australian metropolitan trauma centre. **Methods** Based on growing evidence in the literature the MSCT is used as the primary imaging tool in severely injured patients and is routinely performed after completion of primary and secondary survey. The routine protocol consists of a non-contrast head and cervical spine CT, followed by a contrast chest, abdomen and pelvic CT. Apart from an initial chest X-Ray, routine X-ray trauma series are not performed anymore. The criteria for this whole-body MSCT are strictly limited to patients that required trauma team activation and can be sufficiently stabilised in the emergency room. **Results** This adapted diagnostic algorithm has shown to be very fast and efficient. The average duration of initial management can be reduced significantly, in addition the number of initially missed injuries is markedly reduced. **Conclusions** Primary whole-body MSCT has become a valuable diagnostic tool in the emergency management of severe trauma. A strictly followed protocol has been shown to be crucial to avoid overuse, in terms of radiation as well as exposing the unstable patient to an unnecessary high risk.

TS06 NEUROTRAUMA IN THE RURAL AND REMOTE SETTING

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This paper reviews the management of head injuries arising in the rural and remote areas of Queensland.

Methodology Data was obtained from the Queensland Trauma Registry from January 2003 to December 2004, a total of 3,088 patients, 1667 classified as major injury.

Queensland is the second largest state in Australia with most of the 4 million population living along the eastern seaboard, mainly in the southeast corner and a widely dispersed rural population in small towns. There are neurosurgical services in Brisbane, the Gold Coast and Townsville.

Results Forty percent of patients are referred from another hospital for definitive care with transfer times of up to 10 hours between the referring and definitive care hospital. Of those requiring craniotomy 60% of patients are referred from another hospital again with lengthy transfer times well beyond the 2 hour transfer time for the deteriorating head injury with intracranial haemorrhage as recommended in the NSA/RACS set of guidelines for the "Management of Acute Neurotrauma in Rural and Remote Locations".

This paper reviews the problems which include deficient retrieval resources, a reluctance by non-neurosurgeons to perform emergency neurosurgery, a lack of training amongst younger surgeons, and perceived medicolegal issues.

The paper also compares the situation in other states and territories.

Conclusions Recommendations are made to improve the delivery of neurotrauma care.

TS07 OUTCOME OF TRAUMATIC RUPTURE OF THE DIAPHRAGM (TRD)

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Purpose TRD is an uncommon but serious consequence of blunt trauma. It is often associated with other life threatening injuries and its diagnosis is challenging. Limited information exists on outcomes following rupture, although there are increasing reports of late recurrent herniation. Our aim was to document the outcome of TRD initially and at intermediate term follow up (up to five years).

Methodology A review of all patients suffering TRD, over the past five years, at The Alfred Hospital was performed. Injury severity score (ISS), associated injuries, diagnosis- early versus late and imaging modality used, and surgical repair technique were recorded. All patients were followed up with a questionnaire, regarding symptoms of recurrence and chest X-ray (CXR).

Results 33 patients (18 female, 15 male; mean age 36 yrs, mean ISS 42) were included. All injury mechanisms were high energy (motor vehicle occupants 27, pedestrians 5, horse rider 1); 25 sustained other intra-abdominal injuries. There were nine early and no late deaths.

CXR was diagnostic in 14 cases, with 23 recognised early (pre-operatively). 6 were diagnosed intra-operatively (5 for instability, 1 following unremarkable imaging). 3 late diagnoses (>24 hours after presentation) occurred, with 1 at 6 months post injury. Emergent primary repair was undertaken using non-absorbable sutures, although in three cases absorbable sutures were used.

Conclusions TRD is associated with high energy blunt force and severe multi-system injury. We advocate emergent primary repair with non-absorbable suture and advise a minimum five year follow-up.

TS08 PROSPECTIVE VALIDATION OF THE INDEPENDENT PREDICTORS FOR POSTINJURY INTRA-ABDOMINAL HYPERTENSION

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Purpose Prospective validation of recently established independent predictors for postinjury abdominal compartment syndrome (ACS) was performed.

Methodology All trauma patients who met inclusion criteria (ICU admission, ISS > 15, Base Deficit (BD) > 5, or resuscitation with >5 L crystalloids) were prospectively monitored. Patients with isolated head injuries were excluded. Demographics, ISS, resuscitation fluids, physiological parameters, intra-abdominal pressure (IAP) and the independent predictors in two time windows "ED discharge" [SBP, crystalloids, Time-to OR, transfusions] and "ICU admission" [crystalloids, urine output (UO), Hb, Temperature, BD] were collected. Data are presented as mean \pm SEM, $p < 0.05$ considered significant.

Results Twenty-two blunt trauma patients were monitored (Age 39 ± 5 years, 77% males, ISS 32 ± 2 , SBP 107 ± 5 mmHg, BD 7 ± 1). No patients developed ACS. Seven patients developed IAH (IAP > 20 mmHg). IAH and non-IAH patients had the same age (41 ± 7 vs 37 ± 5 yrs) and admission BD (7.5 ± 1.3 vs 6.3 ± 1.2). IAH patients had higher ISS than non-IAH patients (39 ± 3 vs 30 ± 2). Outcomes (IAH vs non-IAH): ICU LOS (39 ± 3 vs 30 ± 2), Mortality (0% vs 7%), MOF (29% vs 0%).

"ED-discharge predictors": The IAH and non-IAH patients had similar admission SBP, ED crystalloid volume, transfusions and ED time.

"ICU-admission predictors": IAH and non-IAH patients had similar UO, crystalloid infusions, BD, temperature but the IAH group had lower Hb (99 ± 5 vs 111 ± 3 g/dl) than the non-IAH patients.

Conclusions The incidence of ACS decreased from 14% to 0% in a comparable population. The predictors for ACS did not predict IAH. After the elimination of the lethal ACS, the clinical importance of postinjury IAH has to be defined.

TS09 HOW I DEAL WITH PELVIC EXSANGUINATION

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Pelvic exsanguination is usually fatal unless the patient is injured in a city or region that has a sophisticated trauma care system. Simple rules need to be considered when defining the care strategy for these patients.

Simple rules:

- Establish at pre-hospital care and delivery system
- Recognize the "at risk" patient or injury pattern
- Rule out and/or account for other major sources of bleeding
- Control other sources of bleeding, if possible
- Resuscitate to a "tolerable" blood pressure
 - Blood product replacement: RBCs, platelets and FFP

- Provisionally stabilize the pelvis
 - pelvic binder or sheet
 - ipsilateral femoral traction, in some cases
 - Emergent external fixation?
- Stop arterial bleeding
 - Angiography and selective embolization
 - Exploration and direct pelvic gutter packing
- Don't be fooled by a positive FAST from an extra-peritoneal bladder rupture
 - an ex-lap for a retroperitoneal bleed can be fatal
- To the TICU for continued resuscitation
- Delayed definitive reconstruction when physiologically stable

TS10 OPTIMAL TIMING OF ORTHOPAEDIC DAMAGE CONTROL SURGERY

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- Emergent definitive care of orthopaedic injuries in critical patients may not be the best strategy.
- Critically injured patients not in the operating room for life-saving procedures should be physiologically stable prior to major surgical procedures.
- Patients with closed head injuries must maintain optimal parameters for best recovery.
- Damage control orthopaedic surgery (DCO) is the most controversial and least understood concept in modern trauma surgery.
- A damage control approach to fracture care in the multiple trauma patient has merit.
- Literature (mostly retrospective and single center) is weak and can be interpreted as desired.
 - Early major fracture care may be beneficial
 1. Need to define early
 2. Need to define fracture fixation
- Surgery is performed to improve the physiology of the patient.
- External fixation and delayed definitive fixation for patients in the operating room.
- Bedside application of external fixation or traction until the patient is physiologically stable for definitive care in patients not in need of life-saving surgery.
- Develop a "Risk Adjusted" orthopaedic surgery strategy for each patient.

TS11 ON-SHORE MASS CASUALTY DISASTER RESPONSE: LESSONS FOR AUSTRALIA AND NEW ZEALAND

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"Hurricane Katrina – Unorganized, unprepared and internationally embarrassed" Despite well defined, pre-existing organizational plans and national response strategies, Hurricane Katrina exposed major weaknesses in the ability of a region or nation to respond to a tragedy of significant magnitude. Significant lessons were learned from the event.

Must have in place:

- A national and regional disaster response plan
 - A "Chain of Command / Responsibility" Doctrine
- A national and regional disaster response system
- National, regional and local "Incident Command" structures
- Emergency supply stockpiles
- Pre-established communication frequencies

Major considerations:

- Make this a military function – make all civilian agencies report to them
 - Military has the comm, logistics, command structure, personnel and the training to take on this mission.
- Train for an event at regional and national levels
- Cross train all responders
- Eliminate the red tape at the front end of the event
 - Mobilize and "do it"

TS12 COMBATING COAGULOPATHY

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The clinical trigger to consider the presence of a coagulopathy is the onset of non-surgically controllable bleeding. While earlier consensus documents considered this event predictable by modelling blood loss, and factor level decline, we now recognize confounding variables such as shock, hypothermia, metabolic disturbances and fibrinolysis confuse the picture to such an extent traditional treatment algorithms are irrelevant. The monitoring of coagulopathy by traditional coagulation screens also lacks validation, and is usually so delayed in response time to become irrelevant to appropriate management.

Attaining euvolaemia is possible with large volume dedicated infusion systems but in a patient with massive mediator release and comorbidities may not achieve adequate tissue oxygen delivery. Evidence based transfusion triggers are still lacking. Management of coagulopathy is by component replacement early. Delays occur because of slow coagulation test turnaround times, and the place of newer point of care monitors and thrombelastography needs evaluation. Delay in delivery of blood components due to processing time may worsen the outcome. Factor VIIa probably has a unique place in the management of coagulopathy in these patients, but studies are needed to define dosage and time of dose (2). The management of acidosis and hyperlactaemia are fundamentally improved by better perfusion, but short term correction may be indicated to reinforce coagulation factor function.

1. Phillips TF, Soulier G, Wilson RF. *J Trauma*, 1987; 27: 903–10
2. Boffard K et al *J Trauma* 2005; 59: 8–18

TS13 HAEMOSTASIS IN THE AUSTRALIAN DEFENCE FORCE: THE TOURNIQUET CONTROVERSY

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In civilian trauma concerns about tourniquet-related problems has rendered tourniquets virtually obsolete. The use of tourniquets in a battlefield setting however remains surrounded by controversy. Whilst many accept that if properly used, tourniquets can be life saving devices, opinion is divided regarding its role. Some surgeons have recommended abolition of the tourniquet, whilst others advocate that every combat soldier should be issued with a tourniquet as part of their personal equipment. The recent introduction of the self applied C-A-T tourniquet into the Australian Defence Force has re-ignited controversy as to the appropriate role of tourniquets in an operational setting.

During Vietnam, Desert Storm and Somalia haemorrhage from extremity wounds was a leading cause of preventable combat deaths. Improvements in body armour and increased exposure to blast injury has resulted in a relative increase in limb injuries in recent operations. Experience in Somalia, Iraq and Afghanistan particularly by Special Operations communities has led to a re-assessment of the efficacy of battlefield tourniquet systems. The C-A-T tourniquet has been widely used in Iraq and Afghanistan. No iatrogenic injury has been reported, even with tourniquet times up to 8 hours.

This paper will discuss the history of tourniquet use in the military from its first introduction in 1674 to the most recent ADF doctrine (ADFP XXX). It will also present trial results from the UK and US and recommendations from the 2006 Advanced Technologies Applied to Combat Casualty Care Conference (ATACC).

This paper will address the basis of current doctrine and provide a case for and against the use of tourniquets in an operational setting.

TS14P MANAGING AN EMERGING TRAUMA EPIDEMIC IN AUSTRALIA: ABDOMINAL STAB WOUNDS

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Purpose The incidence of abdominal stab wounds treated at the Royal Melbourne Hospital has noticeably increased over the 12 month period to

March 2006, mirroring an increase in penetrating abdominal trauma through many Australian trauma centers. Management protocols for abdominal stab wounds are still contentious. The current study quantifies the increase in stab wounds at the Royal Melbourne Hospital over a 24 month period and analyzes the management and investigative modalities utilized.

Methodology A review of the Trauma Unit of the Royal Melbourne Hospital was performed for the period of March 20th 2004 until March 20th 2006. All anterior abdominal stab wounds were collated for the site of injury, investigations performed on admission, results of investigations, operations performed, and findings at operation.

Results There were 4244 emergency trauma presentations over the 24 months period between March 20th 2004 and March 20th 2006. The second 12 month period showed a 21.5% increase in overall trauma admissions and a 91.3% increase in anterior abdominal stabbings. The percentage of stab wounds treated conservatively fell by 21.8%, with the percentage of laparotomies increasing by 14.2%. Almost 30% of all patients undergoing surgery had no visceral injury at operation. Twenty CT scans were performed pre-operatively, with a sensitivity of 79% and specificity of 100%.

Conclusion Abdominal stab wounds treated at Royal Melbourne Hospital have substantially increased over the past 12 months. Whilst management is still contentious, a management protocol for anterior abdominal stab wounds is proposed, outlining the role of CT scanning, conservative management, laparoscopy and laparotomy

TS15P

UNCOMMON ABDOMINAL HEMORRHAGE DUE TO BLUNT TRAUMA: BLENDING FROM AN ASYMPTOMATIC ABDOMINAL TUMOR INJURY – A CASE REPORT

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Asymptomatic tumors are not uncommon, may be diagnosed during clinical examination or during surgical interventions for other purposes such as treatment of a hemorrhage due a blunt trauma.

Case report 6 year-old boy had fallen, hitting his abdomen against a rock, and arrived at hospital ten hours later. Initial assessment he was complaining of diffuse abdominal pain; his physical examination showed: respiratory rate: 16 mov/min, blood pressure: 100 × 80 mmHg, heart rate: 100 bat/min, and Glasgow coma score: 15. His abdomen was distended, with guarding and rebound tenderness, and had a palpable mass. FAST ultrasound was positive; and Ct-scan showed an abdominal mass with 15 × 12 × 7 cm dimension, and moderate amount of free blood in the abdominal cavity. Laboratory tests showed: hemoglobin 9.9 mg/dl, hematocritic 28.8%, white blood cells 6.900 cel/dl.

Midline laparotomy was performed, a large, injured and bleeding mesenteric mass was found encircling superior mesentery artery and several small bowel loops; 500 ml of free blood was found in the peritoneal cavity. Mesenteric mass was partially removed with a segment of the small bowel. Findings of anatomico-pathologic examination revealed an intestinal Burkitt lymphoma, with mesenteric linfonodes. Patient had an uneventful postoperative course, and started with quimotherapy.

Comments This case report shows an unusual traumatic abdominal blending that could not be clearly diagnosed before laparotomy was performed. The emergency of this case was bleeding control, decision to remove mass was taken only for this purpose, and not to treat the tumor. As removal of the whole mass was impossible, a partial removal was performed.

TS16P

TUBE THORACOSTOMY: THE IMPORTANCE OF SWING

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Intercostal catheter placement is common practice in the management of haemothorax and pneumothorax, with over 12,000 being inserted per year (1) in Australian hospitals. It is however an invasive procedure with the potential for significant iatrogenic injury. This is even more pertinent in the trauma setting where stress levels are high and time may be limited. Historically, complications that have been associated with intercostal catheter placement include: lung parenchymal laceration, bleeding from intercostal vessel injury,

cardiac injury, ectopic tube placement, empyema, diaphragmatic and intra-abdominal organ laceration. In an attempt to minimise and avoid these complications, there has been a shift in the teaching of the method of tube placement from that of a trocar technique to the blunt dissection (EMST) approach (2). While this will hopefully reduce the rate of procedural complications, it still may not guarantee clinical practice free of complications. Furthermore when these complications are suspected, there is a need for repeated clinical assessment (at times, independent of imaging) in order to allow the early identification any such iatrogenic injury. The presentation will provide a review of the literature and outline the various forms of iatrogenic injury associated with tube thoracostomy; highlight the importance of clinical reassessment following intercostal catheter placement, with particular reference to a case presentation; and discuss techniques to avoid and minimise potential complications.

- (1) www.aihw.gov.au/index.cfm
- (2) Emergency Management of Severe Trauma (ATLS) 1997. Chest trauma management. Ch 4:153.

TS17P

MECHANISMS OF INJURY CAUSING LIMB FRACTURES WITHIN THE PAEDIATRIC POPULATION

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Objective Playground and sporting accidents account for a large percentage of paediatric injuries, yet they are largely preventable. The aim of this study is to investigate the risk factors and mechanisms associated with upper and lower limb fractures in children.

Method 145 children admitted to a regional Australian hospital (Coffs Harbour Base Hospital) totalling 207 upper and lower limb fractures over an 12 month period between January 1st 2004 to December 31st 2004 were identified from the hospital medical records database. Retrospective analysis was performed on demographic data, fracture type and mechanisms causing the fracture.

Results Males accounted for 69.7% of all childhood limb fractures. 77.7% of all fractures were upper limb, while 22.3% were lower limb. The leading causes of lower limb fractures were football injuries, push bike accidents, and aquatic accidents, accounting for 51.8% of all lower limb fractures. Monkey bars, swings, trees, skateboard and scooter accidents were associated with a relatively high prevalence of upper limb injuries when compared to other injury mechanisms. Football, push bike and skateboard accidents alone accounted for 40.6% of fractures in our male patients. This figure was only 4.5% in our female patients, and in general, the causes of fractures in females are more evenly distributed.

Conclusion Limb fractures in children have a diverse range of causes, but specific fractures occur more frequently in particular sexes and with certain activities. There is a role for further injury prevention targeting specific high risk groups and activities.

TS18P

POST INJURY MULTIPLE ORGAN FAILURE: THE AUSTRALIAN CONTEXT

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Background The epidemiology of post-injury multiple organ failure (MOF) is reported to go through changes during the last 15 years. The purpose of this study is to describe the epidemiology of post-injury MOF in Australia.

Methods A 12-month prospective epidemiological study was performed in a Major Trauma Service. Demographics, injury severity (ISS), physiological, MOF status and outcome data was prospectively collected on all trauma patients who met inclusion criteria (ICU admission; ISS > 15; age > 18, AIS head < 3 and survival > 48 hrs). MOF was defined by the Denver MOF score. Data are presented as % or Mean ± SEM. Univariate statistical comparison was performed (Student t- and X-square tests), p < 0.05 was considered significant.

Results Twenty-five patients met inclusion criteria (Age 39+/-5, ISS 27+/-3, Male 60%), three patients (12%) developed MOF. The maximum MOF score was 5.7 +/-1, with duration of 2.3+/-0.7 days. Two patients had respi-

ratory and cardiac failure, while one patient had failure of respiratory, cardiac, hepatic and renal systems. All MOF patients survived. MOF patients tend to have longer ICU stays (18+/-5.5 vs 7+/-0.8 p = 0.17), were older (54+/-17 vs 38+/-5 p = 0.4). None of the previously described independent predictors (ISS, base deficit, lactate, transfusions) were different when the MOF patients were compared with the non-MOF patients.

Conclusion MOF is not as significant a cause of late trauma death as previously reported internationally. Our preliminary data challenges the timeliness of the 10-year-old independent predictors of post-injury MOF. The epidemiology, the clinical presentation and the independent predictors of post-injury MOF requires reassessment for the Australian context.

TS19P

STUDY OF THE PATTERN OF INTRA-ABDOMINAL SOLID ORGAN INJURY – A FIVE-YEAR CENTRAL AUSTRALIA EXPERIENCE

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Purpose This study aimed to evaluate the pattern of solid intra-abdominal organ injuries in Central Australia, with focus on the mechanism of injury, Injury Severity Score (ISS), distribution of injury, role of surgical intervention and their outcome. It aimed to assess if difference exists in the above parameters between the indigenous and non-indigenous population.

Methodology This is a retrospective analysis of a selected group of patients as identified by ICD Codes. Database has been created for patients admitted with renal, pancreatic, hepatic and splenic trauma over a five-year period (2001–2005). Data on demographics, mechanism of injury, distribution of injury, length of stay and ISS has been collected.

Results Seventy-one patients has been identified, with 51 (72%) indigenous and 20 (28%) non-indigenous. 29 patients (41%) were involved in a Motor Vehicle Accident and 33 (46%) were assaulted. There is no statistical difference with the distribution of injury and ISS amongst indigenous and non-indigenous populations. However there appears to have a higher incidence of surgical intervention associated with the indigenous group (28.8% versus 12.5%). This may be explained by the compliance rate as 29.4% of

indigenous patients left against medical advice as compared with 0% with the non-indigenous group.

Conclusion The mechanism, pattern and severity of injury appear to be comparable amongst the indigenous and non-indigenous population in Central Australia. However there is a difference in their incidence of surgical intervention. ISS may not be as useful in prediction for need for intervention in this group and a different approach to trauma management may need to be tailored to this population.

TS20P

LAPAROSCOPIC REPAIR OF TRAUMATIC DIAPHRAGMATIC HERNIAE: A CASE PRESENTATION AND SYNTHESIS OF THE LITERATURE EXPERIENCE

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Purpose Traumatic diaphragmatic herniae are an uncommon sequelae of abdominal trauma which present a significant diagnostic challenge, especially when unaccompanied by other intraabdominal injuries necessitating exploratory laparotomy. Laparoscopic repair is a relatively new and uncommon procedure, with the literature consisting almost entirely of isolated case reports and small case series. We present one of our own cases, and perform a quantitative analysis of the combined literature experience to date.

Methodology Cases reports of laparoscopic repair of traumatic diaphragmatic herniae were identified by a Medline literature search. Clinical findings, technical decisions and outcomes were correlated via database.

Results Data from 50 cases was available. There was no common standard method of repair although the majority (31/50) were accomplished without the use of mesh. The major complication rate was 4%, the overall complication rate was 16%. Defects greater than 10cm long were associated with a 41% rate of open conversion, versus 0% if less than 10cm. There were no recurrences described.

Conclusion Laparoscopic repair of traumatic diaphragmatic herniae enjoys a low rate of major complications, whilst avoiding the morbidity of open repair. Several technical points remain open to operator preference, and we invite discussion regarding the merits of each.