



# Emergency Medicine research summary

Findings Relevant to WCG Health, 2013 to June 2015



## RESEARCH OUTPUTS: 2014-15

# Emergency Medicine research outputs

### Relevant findings from 2013 to June 2015

This document summarises the most relevant research content from the academic Divisions of Emergency Medicine as it pertains to Western Cape Government Health. The intention is to make this an annual document, with the next iteration in January 2016 summarising all of 2015 outputs.

Although some findings have a wider scope (national or continental) all presented in this report have relevance to emergency care within the Western Cape.

This document was compiled from both research outputs through dissertation and publication (in some instances both). Where a publication resulted from a dissertation, the publication was referenced and not the dissertation. Unpublished papers and material have not been included in this report.

### Reading this document

Findings are arranged alphabetically by the author's last name and the year, starting with the most recent year (2015) and working backwards.

Findings of particular interest are highlighted in the table of contents and clearly marked in the text. Original dissertations from the University of Cape Town are available on [OpenUCT](#). Original dissertations from Stellenbosch University are available in the Tygerberg campus library. Publications are all available online.

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## 1 2015

### 1.1 Different teaching techniques appears equal in providing skill and knowledge of manual defibrillation skill in medical students

From: Archer E, Van Hoving DJ, De Villiers A. In search of an effective teaching approach for skill acquisition and retention: Teaching manual defibrillation to junior medical students. *Afr J Emerg Med.* 2015;5(2):54-59

The study investigated the influence of three different instructional approaches (traditional, Peyton's four-stage, and a modified five-step method) on the acquisition and retention of manual defibrillation skills. It was unable to determine which method would be best suited for simulation-based teaching in a resource-constrained environment; none of the three instructional approaches proved to be superior.

### 1.2 Poor short-term outcomes regarding prehospital treatment for patients with symptomatic hypoglycaemia

From: Booley MR, Welzel T. A cross-sectional analysis of the short-term outcomes of patients receiving prehospital treatment for symptomatic hypoglycaemia in Cape Town. *Afr J Emerg Med.* 2015. doi:10.1016/j.afjem.2015.03.003

A total of 110 patients treated pre-hospitally for hypoglycaemia were telephonically interviewed. It was found that 21 (19%) had subsequently died, 30 (34%) reactivated EMS within seven days of prehospital treatment, 48 (54%) had recurrent episodes within seven days of prehospital treatment and in 47 (53%) received no follow-up instructions. **The current strategy of dealing with hypoglycaemia in the prehospital environment needs careful re-evaluation to improve the quality of management of this patient population.**

### 1.3 Emergency care delivery recommendations for healthcare facilities in sub-Saharan Africa

From : Calvello EJ, Tenner AG, Broccoli MC, et al. Operationalising emergency care delivery in sub-Saharan Africa: consensus-based recommendations for healthcare facilities. *Emerg Med J.* doi: 10.1136/emmermed-2015-204994

A major barrier to successful integration of acute care into health systems is the lack of consensus on the essential components of emergency care within resource limited environments. The 2013 African Federation of Emergency Medicine Consensus Conference identified the essential services provision associated with 6 emergency sentinel conditions. Levels of emergency care were assigned based on the expected

capacity of the facility to perform signal functions, and the necessary human, equipment and infrastructure resources identified. **These consensus-based recommendations provide the foundation for objective facility capacity assessment in developing emergency health systems that can bolster strategic planning as well as facilitate monitoring and evaluation of service delivery.**

#### 1.4 Investigation and management of foreign body ingestion in children

From: Delport CD, Hodkinson PW, Cheema B. Investigation and management of foreign body ingestion in children at a major paediatric trauma unit in South Africa. Afr J Emerg Med. 2015. doi:10.1016/j.afjem.2015.06.004

Foreign body ingestion in children is a common presentation to emergency centres. In South Africa, there are no established management guidelines. The study was a retrospective chart review of foreign body ingestion at a paediatric trauma centre, their presenting symptoms, investigations and subsequent management. **It highlighted the need for the establishment of guidelines for the management of FB ingestion** including hand held metal detectors (aimed at decreasing radiation exposure in this vulnerable population).

#### 1.5 Poor knowledge amongst all levels of emergency care providers regarding child abuse

From: Dessena B. A study to determine perceived and actual knowledge of Cape Town Emergency Care Providers with regard to child abuse. MSc thesis. University of Cape Town; 2015

This study looked at the actual and perceived knowledge of Cape Town emergency Medical Care Providers in dealing with child abuse. It highlights that treatment of child abuse is mainly confined to treating of physical injuries at all levels of care and not dealing with disclosure of abuse. **Responses across all 120 respondents revealed a huge gap in the training of this area.**

#### 1.6 Lack of first aid and basic life support skills in early childhood development workers and educators

From: Evans D. Evaluating the need for first aid and basic life support training in early childhood development workers and educators in Cape Town, South Africa. MMed thesis. University of Cape Town; 2015

The BLS and first aid knowledge of 214 ECD practitioners working in the Western Cape was evaluated in this study. The predefined pass mark of 75% was only achieved by

12.1% of the participants. The majority of participants reported that emergency incidents had taken place in their environment. 99% of the participants indicated a desire to pursue further education and training in first aid and BLS and all acknowledged the importance of training. **There is a pressing need to train and educate staff regarding first aid and BLS practices.**

### 1.7 Poor adherence to mental health act when dealing with the patient with a suicide attempt refusing care

From: Evans K. Prehospital care providers' decision to transport the patient with a suicide attempt refusing care: A survey based on the Mental Healthcare Act of 2002. MMed thesis. University of Cape Town; 2015

A vignette-based survey was used to collect data related to training and knowledge of the mental health act in the prehospital environment. Key findings included negative attitudes towards suicidal patients, lack of use of formal suicide evaluation tools and finding suicidal patients dead on later return. Only 7% had specific training in the mental health act whilst 80% had no training in the management of suicidal patients. This did not correlate with qualification level. **It is essential that training be addressed to promote a better understanding of care requirements in this vulnerable group.**

### 1.8 Paediatric critical care pathways in the Western Cape

From: Hodkinson PW. Developing a patient centred care pathway for paediatric critical care in the Western Cape. PhD thesis. University of Cape Town; 2015

The Pathways to Care Project examined the journey through the health system of a cohort of critically ill children through expert review of each step from first access to healthcare through admission to Red Cross PICU or death in EC. Of 282 children, 85% were medical and 15% trauma. Global quality of care was graded poor in 20% and 50% had at least 1 major impact modifiable factor. Key modifiable factors related to access and identification of the critically ill, assessment of severity, inadequate resuscitation, delays in decision making and referral, and access to PICU. Standards compliance increased with increasing level of facility, as did caregiver satisfaction. Children (median age 7.8 months) presented primarily to PHC (54%), largely after hours (65%), and were transferred with median time from first presentation to PICU admission of 12.3 hours. There was potentially avoidable severity of illness in 74% of children, indicating room for improvement. More effective and objective ways of identifying and fast tracking acutely ill children are needed (especially in PHC). Common diagnoses such as respiratory tract infections were inadequately managed,

particularly in infants, suggesting educational interventions could be focussed on a small group of conditions. **Rationalization (such as fast tracking of patients directly from PHC to PICU) and better prioritization of EMS services could improve referral delays, and review of the overall process and the system at the referral hospital would optimize scarce PICU resources.** Many of the findings will almost certainly be generalizable to other sick children, and to adults too, although this was not explicitly investigated.

### 1.9 Huge variability in the availability of alternative devices for the management of the difficult airway

From: Jooste WJL, Van Hoving DJ. The availability of alternative devices for the management of the difficult airway in public emergency centres in the Western Cape. *Afr J Emerg Med.* 2015;5(1):19-23

The study demonstrated that Western Cape public emergency centres are currently inadequately stocked with regard to alternative airway devices. Three centres (20%) had no alternative airway device; five centres (33.3%) stocked only one device; three centres (20%) had two devices and four centres (26.7%) had more than two devices. **A guideline regarding the procurement and implementation of these devices is needed.**

### 1.10 Patient satisfaction with emergency departments

From: Mahomed Z, Wallis LA, Motara F. Patient satisfaction with emergency departments. *S Afr Med J.* 2015;105(6)

In NSH, found that orange, yellow and green priority patients spend an average 295, 286 and 451 minutes respectively in the EC. Despite their 451 minute total time, Green patients needed an average of 24 minutes of clinician time. **Fast tracking in ECs would help alleviate much of the Green patient "burden" on these units.**

### 1.11 Experiences and coping mechanism of EMS personnel to trauma

From: Minnie L, Goodman S, Wallis LA. Exposure to daily trauma: The experiences and coping mechanism of Emergency Medical Personnel. A cross-sectional study. *Afr J Emerg Med.* 2015;5(1):12-18

Qualitative work showed that EMS personnel face many traumatic experiences in their daily jobs, and that injured children are the most traumatic events. Staff experience avoidance symptoms and have no structured coping mechanisms. Very little or no training has been received to prepare them for the emotional effects. **Integrated intervention programmes are needed.**



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### 1.12 Electronic Medical Records

From: Ohuabunwaa EC, Sun J, Jubanyika KJ, Wallis LA. Electronic Medical Records in low to middle income countries: The case of Khayelitsha Hospital, South Africa. Afr J Emerg Med. 2015. doi:10.1016/j.afjem.2015.06.003

There is a growing need and tremendous push towards electronic medical records (EMRs) even in developing areas. This study sought to learn from the implementation process at one hospital in South Africa. In this hospital, EMRs were limited by paper charts needing to be scanned into a system, with limited record clerk and scanning equipment available. This resulted in a backlog of missing records. Future implementations of EMRs should strive for a fully electronic EMR that does not depend on scanning of paper records, and the upfront costs are expected to save the hospitals tremendously in the future.

### 1.13 Emergency care research priorities in South Africa

From: Van Hoving DJ, Barnetson BK, Wallis LA. Emergency care research priorities in South Africa. S Afr Med J. 2015;105(3)

Using expert consensus, Barnetson defined research priorities which the 2 Divisions in Cape Town now use to drive their research areas. **The expert group were primarily working in the Public Sector and so the results are appropriate for our context.** The priority list is included as [appendix A](#).

### 1.14 Knowledge and skills of Basic Life Support CPR by EMS

From: Veronese JP. An Assessment of theoretical knowledge and psychomotor skills of Basic Life Support Cardio-pulmonary Resuscitation provision by Emergency Medical Services in a province in South Africa. MSc thesis. University of Cape Town; 2015

Both the skills and theoretical knowledge of BLS CPR were assessed in EMS providers in the Eastern Cape. Median knowledge score was 50% and median skills 22%. Continuous and tailored BLS CPR instruction is required to bring EMS up to international competency standards. The findings raise a concern for BLS CPR skill and knowledge of EMS providers in other provinces including the Western Cape. **It is recommended that quality checks on skill and knowledge of BLS CPR be initiated.**

## 2 2014

### 2.1 Photograph-based diagnosis of burns

From: Boissin C, Laflamme L, Wallis L, et al. Photograph-based diagnosis of burns in patients with dark-skin types: The importance of case and assessor characteristics. *Burns*. 2015. doi: 10.1016/j.burns.2014.12.014

This paper showed the key role that smartphones and tablets play in providing remote medical advice. This paper relates to the use of a smartphone based application for providing expert burn care to PHC sites and rural ECs. **WCG should make more aggressive use of portable technology in health service provision.**

### 2.2 Increasing health literacy in informal settlements

From: Bress J. Using community-based emergency first aid responders to increase health literacy in South African informal settlements, through the use of the Ophelia process. MSc thesis. University of Cape Town; 2014

The introduction of community medical responders via the EFAR programme raised the issue of health literacy within the communities it served. For this study a health literacy questionnaire was developed and validated to track community literacy needs. The tool can now be used by community medical responders such as EFAR operatives to identify health literacy needs.

### 2.3 Presentations during the 2010 FIFA World Cup

From: Galal M. Patient presentations during the 2010 FIFA World Cup: Cape Town, South Africa's public emergency centres. MMed thesis. University of Cape Town; 2014

Data was collected in seven emergency centres and compared with a control period one year prior to the World Cup. Analysis showed no significant impact on emergency centre load or flow during the World Cup.

### 2.4 Current practice of air medical services in inter- facility transfers of paediatric patients

From: Howard IL, Welzel TB. Current practice of air medical services in inter-facility transfers of paediatric patients in the Western Cape Province, South Africa. *South African J Child Heal*. 2014;8(4): 143-148

The study described the utilization of the air medical services for the inter-facility transfer of paediatric patients in the Western Cape for Jan 2010 to Dec 2011. There was a relatively high utilization rate of approx. 25% across both fixed and helicopter

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platforms, for patients of varying pathologies and severities. The adverse events observed in this study were found to be lower than those examining non-specialized paediatric transfers and comparable to research describing transfer by specialised teams. The air medical services remain a safe and viable alternative to the road-based inter-facility transfer of paediatric patients in the Western Cape

### 2.5 Case mix at New Somerset Hospital Emergency Centre

From: Khan W. New Somerset Hospital Emergency Unit Cape Town: A Cross Sectional Survey. MMed thesis. University of Cape Town; 2014

Data was collected over a 1 month period of all patients cared for at New Somerset Hospital Emergency Centre. The study included 3168 patients of which 83% were adults. In terms of acuity, red and orange patients comprised 31% of case load. Surges were noted daily between 10:00-12:00 and 14:00-15:00. Weekdays were busier than weekends. **This information is useful to predict case load at different times of the day and week.** Its findings can however, not be extrapolated to other city emergency centres. Similar studies are needed in the latter to form a clearer picture of case load across the region.

### 2.6 Major incidents in the Western Cape, South Africa

From: Lategan HJ. Major incidents in the Western Cape, South Africa: a descriptive study. MMed thesis. University of Cape Town; 2014

There were 563 incidents in the 50 months analysed that involved 6473 patients. The majority of incidents were traffic related (89%) and occurred during daylight (56%). Almost 25% of incidents involved children. Closer inspection of the findings likely holds implications for future major incident planning and response.

### 2.7 Lack of certification towards Point of Care Ultrasound

From: Lemke G. The State of Point of Care Ultrasound Certification in South Africa. Why are so Few Providers Completing the Certification Process? MMed thesis. Stellenbosch University; 2014

A total of 90 out of 218 (41, 3 %) course attendees completed the questionnaire of which 23/43 (53%) represented the certified group and 63/175 (36 %) the non-certified group. The most common obstacle identified by the certified group, 15/23 (62.5 %), was scarcity of pathology (positive scan findings) resulting in difficulty gathering prerequisite scans. Time constraints were identified as both the most common 49/63

(77.8 %) and the top rated obstacle 27/63 (42.9 %) by the non-certified group and the top obstacle by the certified group, 9/23 (39.1 %). Of the non-certified respondents, 44 (69.8 %) still aim to complete the certification process. Worryingly 33/63 (52.4 %) of non-certified providers utilize point of care ultrasound more than three times a week in their clinical practice.

## 2.8 Guidance for performing CT brain in head injury. Reasonable compliance in periphery, less so at tertiary

From: Moilola D. Referral for CT brain in adult patients with head injury: are Emergency Centre doctors adhering to the Western Cape Head Injury guidelines? MMed thesis. Stellenbosch University; 2014

The Western Cape head injury guidelines were developed to guide EC doctors with the management of acute head trauma. This study evaluated whether emergency centre doctors in the Western Cape are guideline-compliant when referring adult patients with head injury for CT head scans at the five local public hospitals with CT scan facilities (Groote Schuur, Tygerberg, GF Jooste, New Somerset, and Paarl). Results showed that GF Jooste, New Somerset, Paarl were more likely to adhere to Western Cape head injury guidelines than tertiary hospitals during working hours (81% and 59% respectively). Guideline compliance after-hours at Groote Schuur and Tygerberg was 73%, almost similar to rates at GF Jooste, New Somerset, and Paarl. **Lack of compliance results in misuse of resources. This will affect cost and flow.**

## 2.9 The use of the CT scan in paediatric blunt trauma

From: Roman B. The use of the CT scan in paediatric blunt trauma. MMed thesis. Stellenbosch University; 2014

This study described the use of abdominal CT scan and the clinical implications of positive findings following blunt abdominal trauma in paediatric patients at Red Cross War Memorial Children's Hospital using a retrospective chart review of all children under the age of 13 years who had an abdominal CT scan following blunt abdominal trauma, over a two year period. Patient demographics, injury mechanism, indication for CT, timing, priority, CT findings and management following CT were all analysed. A total of 86 patients were identified. Thirty (35%) CT's were reported as normal, 76 (88%) patients were treated non-operatively and 10 (12%) patients had surgery as a result of CT findings. Given the concerns of radiation exposure during an abdominal CT scan and the low clinically significant yields, in this era of conservative management **the need for widespread use of abdominal CT for paediatric trauma is questioned.**



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### 2.10 Emergency medical service response system performance

From: Stein COA. Emergency medical service response system performance in an urban South African setting: a computer simulation model. PhD thesis. University of Cape Town; 2014

Stein modelled EMS performance using Cape Town historical data. Results indicated that a single-tier model – one which uses ambulances only, not ALS response cars - produced the best response time performance, although both systems fall well short of P1 response time targets. He further showed that the model using only ambulances had shorter response times and a greater number of responses meeting response time targets. A small improvement was observed with the first incremental addition of vehicles. After this, improvements rapidly diminished and eventually became negligible - response time targets were never met, even with a seven-fold increase in vehicle numbers. Stein also looked at reducing hospital turnaround time and scene time. Between the *worst* (scene time = 40 min, hospital time = 25 min) and *best* (scene time = 15 min, hospital time = 15 min) there is a 4.2% improvement in the proportion of P1 patients making the response time target (but the 90% benchmark is still very far away). There was very little to no effect on P2s. **It seems that the costs of aiming to reduce hospital turnaround time (from around 18-20 minutes now, to 15 minutes) will produce very little benefit.** In summary, Stein showed that we should use ambulances only, that additional vehicles are a small part of the solution, and that reducing hospital turnaround times to 15 minutes would have minimal effects on response target performance.

### 2.11 Implementing and supporting pre-hospital emergency medical systems in developing areas of South Africa

From: Sun JH, Shing R, Twomey M, et al. A strategy to implement and support pre-hospital emergency medical systems in developing, resource-constrained areas of South Africa. *Injury*. 2014;45(1):31-8

Current models of pre-hospital emergency care are inappropriate for or beyond the means of low and middle income countries; new ones that can both function in an under-developed area's particular context and grow with the area in a graduated fashion are needed. This study uses a multi-pilot and consensus approach to develop a strategy to implement and support pre-hospital emergency care systems in under-resourced areas. **Local emergency first aid responders, transporters, and community based organizations can coordinate with each other to implement pre-hospital emergency care, and the system can be implemented in a graduated manner based on available resources without having to rely on the whole system being implemented first to provide partial function.**

## 2.12 Injury severity in relation to seatbelt use

From: Van Hoving DJ, Hendrikse C, Gerber RJ, et al. Injury severity in relation to seatbelt use in Cape town, South Africa: A pilot study. South African Med J. 2014;104(7):488–92.

This paper described the relationship between seatbelt usage and injury severity in occupants involved in road traffic collisions in Cape Town. Prevalence of seatbelt usage was only 25.2%. Unrestrained occupants were 5 times more likely to have a high triage score; trends suggested associations between seatbelt non-use and young male occupants, as well as early morning and late night driving. Seatbelt non-users were more likely to be admitted. **Public awareness initiatives are recommended to make road users aware of the dangers of not wearing seatbelts.**

## 2.13 Poor knowledge of Arterial Blood Gases in Emergency Medicine amongst registrars and consultants

From: Xafis P. Arterial Blood Gases in Emergency Medicine: how well do our registrars and consultants currently enrolled in the Western Cape Division of Emergency Medicine interpret them? MMed thesis. Stellenbosh University; 2014

Consultants and emergency medicine trainees do not appear to be proficient at interpreting Arterial Blood Gases. Lack of theoretical knowledge and/or decay of current knowledge are likely responsible. **A rethink of current training should be considered for the curriculum.** This may include formal teaching sessions, enhanced with access to Arterial Blood Gases resources for self-directed learning (via social-media and computer assisted learning techniques). Consultants need regular CME as decay in Arterial Blood Gases interpretation skills is likely unrecognized.

### 3 2013

#### 3.1 Deep Vein Thrombosis associated with HIV and TB

From: Alshehri MF. Risk factors for Deep Vein Thrombosis in a South African public hospital. MMed thesis. University of Cape Town; 2013

This was a case review of patients with ultrasound confirmed DVT at GF Jooste hospital. HIV status was positive in 393 (64.4%), negative in 53 (8.6%) and unknown in 164 (26.8%). TB status was positive in 339 (55.5%) and negative in the rest. In addition, 264 patients were positive for both HIV and TB; 135 patients were unknown to have HIV or TB. **It appears that the DVT is associated with HIV or TB.** More research is required to optimally define the risk factors in our population in order to develop a locally relevant DVT clinical decision rule.

#### 3.2 Spinal immobilization little effect on heart rate, blood pressure and respiratory rate

From: Buijns SR, Guly HR, Wallis LA. Effect of spinal immobilization on heart rate, blood pressure and respiratory rate. Prehosp Disaster Med. 2013;28(3):210-4

The study enrolled 53 healthy subjects whose heart rate, blood pressure and respiratory rate were compared when they were at rest, fully spinal immobilised, partially spinal immobilised or just semi reclined on a hospital stretcher. Although pain and discomfort were significantly higher in the restrained groups, the heart rate, blood pressure and respiratory rate had hardly any response. **Abnormal vital signs should not be considered to be the result of immobilisation. Likewise, pain and discomfort in immobilised patients should not be disregarded due to lack of changes in vital signs.**

#### 3.3 A role for pre-hospital intercostal chest drains

From: Dippenaar E. Identifying the role of pre-hospital intercostal chest drains in South Africa. MPhil thesis. University of Cape Town; 2013

The aim of this study was to determine current opinion amongst emergency care experts, with regard to the placement of ICD's in the pre-hospital environment in South Africa. A modified Delphi technique followed by a focus group interview was used to establish the role of pre-hospital intercostal chest drains. **The role of pre-hospital intercostal chest drains was supported by expert consensus.** Further investigation is required to determine the feasibility of including intercostal chest drains for pre-hospital emergency medical care in current curricula.

### 3.4 Attitudes towards patient substance abuse and addiction in the Emergency Centre

From: Kalebka RR, Bruijns SR, Van Hoving DJ. A survey of attitudes towards patient substance abuse and addiction in the Emergency Centre. Afr J Emerg Med. 2015;3(1):10-17

A prospective survey based on the Substance Abuse Attitude Survey was conducted in a convenience sample of 85 emergency physicians and trainees to determine attitudes towards patient substance abuse and addiction in the Emergency Centre. Despite receiving very little formal instruction in addiction and substance abuse, a majority of emergency physicians were in daily contact with substance abuse related cases. Participants were largely in favour of brief interventions in the emergency centre assuming adequate resources.

### 3.5 Poor confidence at initiating BLS for emergency centre nurses

From: Maharaj S. A survey to determine whether emergency centre nurses are confident in initiating BLS across emergency centres in the Western Cape metropole. MMed thesis. Stellenbosch University; 2013

A questionnaire was used to conduct an anonymous survey amongst 300 EC nurses regarding their confidence to initiate BLS. Both public (low resourced) and private (high resourced) hospitals were included. A total of 61 % respondents were very confident in recognising a cardiac arrest, 59% were very confident for managing an airway, whilst 67% were very confident initiating CPR. Public hospital nurses were less confident than private hospital nurses. **It is alarming that nurses working in ECs have such poor confidence levels with regards to a core EC skill.** This highlights an acute need for BLS training at ECs irrespective of whether public or private.

### 3.6 Misuse of short stay units in emergency centres

From: Rajbaran J. Short stay units in emergency centres, in the Western Cape- A survey based on the current utilization of these units. MMed thesis. Stellenbosch University; 2013

The study focused on the current utilisation of these short stay units (SSUs) in Western Cape public ECs. The aim was to provide a snap-shot of the current utilisation. The results showed variations amongst the different facilities regarding patient numbers and demographics. SSUs are not being optimally utilised and patients exceeded the internationally acceptable maximum length of stay (LOS). **The most significant burden on SSUs was psychiatric patients. SSUs only fulfilled its primary function 46% of the study group.** SSUs pose an opportunity to relieve crowding and increase turn around if used

correctly. More work is required to improve the state of SSUs so that it is not used as just another ward.

### 3.7 Components of a Medical Cache required for medical deployment after a major incident or disaster

From: Seymour N. Modified Delphi study to determine the components of a Medical Cache required for local or international medical deployment after a major incident or disaster. MPhil thesis. University of Cape Town; 2013

A three iteration Delphi was conducted to determine contents of a medical cache for medical deployment after a major incident or disaster. The full dissertation with the final consensus list is available at <https://open.uct.ac.za/handle/11427/13313>.

### 3.8 Emergency centre investigation of first-onset seizures in adults

From: Smith AB, Van Hoving DJ, Wallis LA. Emergency centre investigation of first-onset seizures in adults in the Western Cape, South Africa. S Afr Med J. 2013;103(10):723-7

This study demonstrated inconsistency and wide local variance for all types of investigations done in patients presenting with first-onset seizures to Emergency Centres. **It emphasises the need for a local guideline to direct doctors to appropriate investigations, ensuring better quality patient care and potential cost-saving.** It is likely that the investigation practice revealed in this study cohort, also apply to other cohorts. Further research is needed.

### 3.9 A useful medical resource model for mass gatherings

From: Smith WP, Tuffin H, Stratton SJ, et al. Validation of a modified medical resource model for mass gatherings. Prehosp Disaster Med. 2013;28(1):16-22

This study was undertaken to validate the modified Medical Resource Model tool using data from events held in both a developed and a developing country. A retrospective study was conducted utilizing prospectively gathered data from individual events at Old Trafford Stadium, United Kingdom and Ellis Park Stadium, South Africa. **With the exception of a specific subset of events at Ellis Park, the rate of under-prediction for this model was acceptable.**

### 3.10 Prehospital airway management outcomes in severe traumatic brain injury

From: Sobuwa S, Hartzenberg HB, Geduld H, et al. Outcomes following prehospital airway management in severe traumatic brain injury. S Afr Med J. 2013;103(9):644-6

The study was a descriptive observational analysis of 124 consecutively injured adult patients who were admitted for severe TBI (Glasgow Coma Score  $\leq 8$ ) to Groote Schuur and Tygerberg hospitals. Patients were categorised by their method of airway management: rapid sequence intubation (RSI), sedation-assisted intubation, failed intubation, basic airway management, and intubated without drugs. Good outcomes were defined by a Glasgow Outcome Score of 4-5. The study found a statistically significant association between airway management and outcome. **Prehospital intubation did not demonstrate improved outcomes over basic airway management in patients with severe TBI.**

### 3.11 Learning and retention of emergency first aid skills in a township

From: Sun JH, Wallis LA. Learning and retention of emergency first aid skills in a violent, developing South African township. Emerg Med J. 2013;30(2):161-2

Community members in developing areas can effectively learn first responder training, and skill decay afterwards is not continuous--there is a considerable amount that is retained indefinitely. It is critical that training be done in the trainees' primary language, even if they speak other languages fluently. **Making a first responder training course obligatory instead of voluntary does not affect the learning and retention rates of the material.**

### 3.12 Poor outcomes of cardiopulmonary resuscitation in public sector hospitals

From: Tiyiselani M. A prospective study on the outcomes of adult cardiopulmonary resuscitation. MMed thesis. Stellenbosch University; 2013

Adult patients aged 13 years and older who had a cardiac arrest and on whom CPR was performed as in-hospital patients at GF Jooste and New Somerset Hospitals from 1 May 2011 to 31 October 2011 were enrolled in the prospective case review study. A total of 125 consecutive CPR attempts met the inclusion criteria. Overall rates of immediate survival, survival at 24 hours, and survival to discharge were 48.8%, 18.4%, and 12% respectively. Survival to discharge was largely due to CPR occurring in the

**EC. No patients suffering cardiac arrest in a ward survived. It is likely that outcomes are even worse in hospitals without an ICU.** Further study is required to establish the role of treatment escalation plans and the nature of do-not-resuscitate orders in the light of these findings.

### **3.13 Validation of the revised South African Triage Scale for children**

From: Twomey M, Cheema B, Buys H, et al. Vital signs for children at triage: A multicentre validation of the revised South African Triage Scale (SATS) for children. *S Afr Med J.* 2013;103(5):304-8

The paediatric South African Triage Scale (SATS) was validated against admission as a reference standard. A total of 2014 children were included. The percentage of hospital admissions increased with an increase in the level of urgency from 5% in the non-urgent patients to 73% in the emergency patients. The data demonstrated that sensitivity increased substantially when using the SATS, (Se 91.0%, NPV 95.3%), compared with use of clinical discriminators in isolation (Se 57.1%, NPV 86.3%) or the TEWS in isolation (Se 75.6%, NPV 89.1%). The results of this study illustrate that the revised paediatric SATS is a safe and robust triage tool.

### **3.14 Adequacy of the emergency ultrasound curriculum for the local burden of disease**

From: Van Hoving DJ, Lamprecht HH, Stander M, et al. Adequacy of the emergency point-of-care ultrasound core curriculum for the local burden of disease in South Africa. *Emerg Med J.* 2013 Apr;30(4):312-5

This study was an attempt to ensure an evidence-based approach to assess the adequacy of the point-of-care ultrasound curriculum in South Africa. The results illustrate that our local burden of disease may require a change of the current curriculum. Further research is required.

### **3.15 Patterns of seatbelt use in different socioeconomic communities**

From: Van Hoving DJ, Sinclair M, Wallis LA. Patterns of seatbelt use in different socioeconomic communities in the Cape Town Metropole, South Africa. *S Afr Med J.* 2013;103(9):628-31

The impact of road traffic injuries is significant, but can be decreased by using appropriate restraining devices. Occupants from high-income areas were more likely to wear seatbelts (odds ratio (OR) 4.35; 95% confidence interval (CI) 3.89 - 4.88). Use



## RESEARCH OUTPUTS: 2014-15

of child restraints was poor overall (22.3%), but also varied according to income areas. **Specific interventions are required to target these communities directly.**

## Appendix A. Research priorities

- Table 1. Ranked research priority topics related to prehospital emergency care
- Table 2. Ranked research priority topics related to clinical emergency care
- Table 3. Ranked research priority topics related to general systems and safety management

Table 1. Ranked research priority topics related to prehospital emergency care

Rank	Research statement	Study design
1	Determine which prehospital interventions improve outcomes in trauma or critically ill patients	Randomised controlled trial
2	Determine the most appropriate prehospital management strategies in southern Africa	Systematic review ± meta-analysis
Tie 3rd	Optimise the use of resources in terms of transfers and transport in emergency medical services	Non-consensus
Tie 3rd	Compile evidence-based guidelines for the critical care transfer of patients	Systematic review ± meta-analysis
5	Determine the outcomes of prehospital drug-facilitated intubations	Non-consensus
6	Determine an appropriate mass casualty system for southern Africa	Systematic review ± meta-analysis
7	Implications of the abuse of ambulance services to transport non-emergency cases	Descriptive study
8	Define the role of aeromedical transport in rural areas	Descriptive study

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Table 2. Ranked research priority topics related to clinical emergency care

Rank	Research statement	Study design
1	Determine how competent emergency care providers are in performing common lifesaving skills within their scope of practice	Non-consensus
2	Determine whether emergency care providers are competent in recognising and handling a failed airway	Descriptive study
3	Determine the burden of disease and patient conditions that present to the emergency centre	Descriptive study
4	Determine how competent emergency nurses are in recognising critically ill patients	Descriptive study
5	Determine markers of severity in the trauma or critically ill patient	Systematic review $\pm$ meta-analysis
6	Determine how competent emergency care providers are in providing paediatric critical care	Descriptive study
7	Develop effective pain management strategies for all acute-care patients Systematic review $\pm$ meta-analysis	Systematic review $\pm$ meta-analysis
8	Determine the knowledge and utilisation of non-invasive ventilation by emergency care providers	Descriptive study
9	Determine the efficacy of nurse-led triage	Non-consensus
10	Determine the need for a national poison information centre	Descriptive study
11	Determine appropriate spinal immobilisation techniques in the SA context	Non-consensus
12	Determine whether paediatric seizures are managed appropriately by all emergency care providers	Descriptive study
13	Determine whether toxicological cases are appropriately managed by all emergency care providers	Non-consensus
14	Determine whether paediatric febrile illnesses are managed appropriately	Descriptive study
15	Determine the impact of low-dose digital X-ray (LODOX) machines on emergency trauma patient management	Non-consensus

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Table 3. Ranked research priority topics related to general systems and safety management

Rank	Research statement	Study design
1	Implement and review quality improvement systems	Non-consensus
2	Determine whether evidence-based healthcare is adhered to in providing emergency care	Descriptive study
3	Develop strategies to reduce child and infant morbidity and mortality	Systematic review ± meta-analysis
4	Comparison of the different acute-care systems in order to improve understanding and implement integrated care pathways	Systematic review ± meta-analysis
Tie 5 <sup>th</sup>	Determine whether lifesaving equipment is checked before commencing duty	Systematic review ± meta-analysis
Tie 5 <sup>th</sup>	Determine the cost-effectiveness of providing emergency care	Systematic review ± meta-analysis
7	Determine the true implication of prolonged length of stay in emergency centres	Non-consensus
8	Determine the impact of National Health Insurance on emergency care	Non-consensus
9	Determine efficacy of infection control measures in various acute-care settings	Non-consensus
10	Determine valid and reliable assessment methods for emergency care educational examinations	Non-consensus
11	Determine the efficacy of hospital case load policies	Non-consensus
12	Determine whether informed consent is appropriately undertaken in the emergency care setting	Descriptive study
13	Determine whether adequate emergency centre discharge instructions are given to patients	Descriptive study
14	Determine how emergency care trainees perceive their future in emergency care in southern Africa	Descriptive study
15	Determine the impact of occupation-specific dispensation on recruitment and retention of emergency centre staff	Descriptive study