Scientific abstracts from the 2017 Rwanda Emergency Care Association conference

On 12th May 2017, the Rwanda Emergency Care Association held its 2nd annual conference with the theme delivering accessible and sustainable emergency care. The conference included parallel tracks on emergency medicine health systems, research and education, medical emergencies, prehospital and disaster preparedness, critical care, and trauma. Nine oral abstracts and ten posters were presented. The three best oral abstracts and the winning poster, presented below, were selected by an international panel of judges. The Rwanda Emergency Care Association will be playing hosts to the African Conference on Emergency Medicine in Kigali next year. It would be fantastic if you can join us. For more details visit www.afcem2018.com.

Oral abstracts

First place: Estimating children’s weight in a Rwandan emergency centre
Appolinaire Manirafasha*, Sojung Yi, Giles N. Cattermole
*maniappo@gmail.com

Background
Most drugs, fluids and ventilator settings depend on the weight of a paediatric patient; however, knowledge of the weight is often unavailable as the urgency of the situation may impede measurement. The most common methods for paediatric weight estimation are based on either height (e.g. Broselow Tape) or age (e.g. Advanced Paediatric Life Support formulae). The Broselow Tape tends to estimate weight more precisely than age-based rules, although both are less accurate in older or heavier children. It was the aim of this study to describe the accuracy of various weight estimation adjuncts and to derive a dedicated age-based tool within a Rwandan setting.

Methods
A retrospective design was employed, using age, weight and height data obtained from randomly selected charts of Rwandan children aged between one and ten years that attended the paediatric emergency centre, Centre Hospitalier Universitaire de Kigali, Kigali. Weights were then estimated using four editions of the Broselow Tape and standard age-based formulae. These included the current and previous versions of the Advanced Paediatric Life Support formulae, the Luscombe formula and the finger-counting method. Linear regression was applied to determine a local, age-based weight estimation formula. Weight estimations were then compared with actual weight through Bland-Altman analysis, and the proportion of estimates within 20% of actual weight.

Results
There were 327 children included in the study, of which 200 included height data. From linear regression, we produced a Rwandan weight estimation formula: weight (kg) = [1.7 \times \text{age (years)}] + 8. This formula and the Advanced Paediatric Life Support formula (weight = [2 \times \text{age}] + 8) performed similarly. Both were better than other age-based formulae (69% of estimates within 20% of actual weight). All editions of the Broselow Tape performed better than age-based rules, with the 1993 version underestimating and the 2011 version overestimating weight. The 1998 version performed better than age-based rules, with the 1993 version underestimating and the 2011 version overestimating weight. The 1998 version performed best with 84.8% of estimates within 20% of actual weight.

Conclusion
This study described various weight estimation adjuncts in a Rwandan paediatric population. The locally-derived formula did not perform better than the Advanced Paediatric Life Support formula and needs further validation. We would advise recommend use of the 1998 followed by the 2007 Broselow Tape edition locally. Where not available, the Advanced Paediatric Life Support formula should be used.
Second place: Comparative evaluation of three trauma prognostication scores among injured patients receivingprehospital care in Kigali, Rwanda
Zachary Lipsman, Adam R. Aluisio, Vincent Ndebwanimana*, Naz Karim, Jean Claude Byiringiro, Giles N. Cattermole, Adam C. Levine
*ndebwanimana@gmail.com

Background
Although trauma prognostication scores to stratify at-risk patients are used commonly in low-resource settings, there are no data on their characteristics within the Rwandan context. This study aimed to evaluate the utility of the Revised Trauma Score (RTS), Triage Early Warning Score (TEWS) and Kampala Trauma Score (KTS) among injured patients at the emergency centre of the University Teaching Hospital Kigali.

Methods
This retrospective cohort collected data on injured patients brought by prehospital services to the emergency centre between December 2012 and February 2015. Scores were compared for the outcome of 14-day mortality using regression models to calculate areas under receiver operating characteristic curves (AUC) with 95% confidence intervals (95% CI).

Results
Of 1669 patients brought by prehospital services, outcomes were available for 774, among which 45 (5.8%) deaths occurred. There were sufficient case data to calculate RTS in 66.9%, TEWS in 33.1% and KTS in 70.9%. All scores were statistically significant predictors of 14-day mortality. The RTS demonstrated the highest discriminatory characteristics (AUC = 0.90, 95% CI: 0.84–0.97) followed by the KTS (AUC = 0.81, 95% CI: 0.71–0.91) and TEWS (AUC = 0.80, 95% CI: 0.66–0.93). For the 250 cases with data on all scores, no significant differences in the AUC were found.

Conclusion
In the studied population, the RTS predicted mortality with high accuracy, though statistical superiority to KTS and TEWS was not demonstrated. These results in conjunction with the relatively minimal requirements for calculation, suggest that use of the RTS in the Rwandan setting may be useful for predicting trauma mortality. However, since only TEWS describes both trauma, and non-trauma, it may be of more practical use where resources limits the services to a single score for all patients.

Third place: Knowledge, attitude and practice of emergency care on road traffic accident victims at three selected Rwandan hospitals
Claudine Nshutiyukuri*, Busisiwe Bhengu, Gishoma Darius
*nshutiyukuric@gmail.com

Background
Quality emergency nursing care is an important variable in reducing death and disability due to road traffic accidents, yet little is known about emergency nursing care within the Rwandan context. This study aimed to describe the knowledge, attitude and practice of nurses in the emergency care of road traffic accident victims.

Method
We employed a cross sectional design to survey the full cohort of emergency nurses employed within the emergency centre of the University Teaching Hospital Kigali (n = 51).

Results
The key findings are described in Figure 1.

![Figure 1](image)

Figure 1. Level of nurses’ topical knowledge and clinical practice, in the management of road traffic accident victims.

With regards to the administration of IV fluids to correct hypotension, nurses with experience less than one year had an odds ratio for giving fluids of 0.17 (95% confidence interval = 0.04–0.17) versus nurses with experience of more than one years with and odds ratio of 5.91 (95% confidence interval = 1.43–24.43). Nurses who had not received specific emergency care training had an odds ratio for giving fluids of 0.17 (95% confidence interval = 0.07–0.82) versus nurses with experience of more than one years with and odds ratio of 4.34 (95% confidence interval = 1.23–15.36).

Conclusion
Levels of knowledge and practice appeared to be either high or very high for the majority of participants. Only training had a significant effect on the provision of emergency fluids. Training interventions to improve the management of road traffic accident victims by emergency nurses should be regularly audited to ensure ongoing quality of care.

Poster abstract
Evaluation of Imaging for Head Trauma. CT scan criteria in the Emergency Department University Teaching Hospital of Kigali, Rwanda
Jean Muragizi*, Giles N. Cattermole
*jmuragizi@gmail.com

The winning poster is provided in Figure 2.
Evaluation of Imaging for Head Trauma. CT scan criteria in the Emergency Department University Teaching Hospital of Kigali, Rwanda

Dr Jean Muragizi, Dr Giles N Cattermole
Resident in EMCC, HRH faculty consultant

Introduction
Traumatic brain injury is a common cause of hospitalization in emergency departments (EDs) worldwide, and especially in low- and middle-income countries. Traumatic intracranial pathology (including extradural, subdural and intra- cerebral haematomas) cause death and disability.

In patients with clinically important brain injury, computed tomography (CT) provides an accurate diagnosis to allow prompt neurosurgical intervention to prevent poor outcomes from intracranial haematomas. However, overuse of CT adds to healthcare costs and subjects patients to unnecessary cancer risks.

To ensure appropriate use of CT, various criteria have been developed for CT in TBI. These include: the Canadian CT Head Rule (CCHR), the American College of Emergency Physicians (ACEP) clinical policy, the New Orleans Criteria (NOC) and the UK’s National Institute for Health and Clinical Excellence (NICE) guidelines. In our ED in Kigali, we had been using the ACEP guidelines. It is not known which guidelines are most appropriate for use in LMIC.

Objectives
- To conduct a quality improvement project (QIP) relating to CT requests for traumatic brain injury in our ED.
- To improve requests for CT scan in traumatic brain injury.
- To improve documentation in traumatic brain injury.
- To minimise unnecessary CT head requests, while ensuring patients who need a CT head receive it.

Methods
Study type: Clinical audit, including pre- and post-intervention data collection.
Setting: ED at the University Teaching Hospital of Kigali, Rwanda.
Duration: Two periods of data collection over one month, one pre-intervention and one post-intervention.

Patients: ED admissions with CT request for traumatic brain injury. For each data collection period (pre- and post- intervention) 40 patients randomly selected for chart review; 20 patients with loss of consciousness (LOC) or post-traumatic amnesia (PTA), 20 patients without LOC or PTA.

Data collection: Set data collection forms were used, including demographic and clinical data relating to the CT criteria in the ACEP guidelines.

Intervention: Following the results of the initial audit, further teaching of ED doctors was undertaken to encourage use of the ACEP guidelines. Posters were used throughout the department.

American College of Emergency Physicians guidelines
A CT brain is required if at least one of the following is present:
- In patients with LOC or PTA: Headache, Vomiting, Age > 60, Drug or alcohol intoxication, Deficits in short-term memory. Physical evidence of trauma above the clavicle. Post-traumatic seizure, GCS > 15, Focal neurological deficit, Coagulopathy.
- In patients without LOC or PTA: Focal neurological deficit, Vomiting, Severe headache, Age ≥ 65, Physical signs of basilar skull fracture, GCS < 15, Coagulopathy. Dangerous mechanism of injury.

Results
- We assessed 80 cases (40 pre-intervention, 40 post-intervention), median age was 30y, and 79% of the sample was male.
- Not all requested scans were performed: reasons included inability to pay, unavailability of CT, patient improvement; cancellation of inappropriate request.
- Following the educational intervention, there was a significant fall in the number of inappropriate CT requests. Fewer scans were performed overall.
- Documentation of relevant criteria was poor, but improved post-intervention. Focal signs were now always mentioned, but coagulopathy was never documented.

Conclusion
Documentation and appropriateness of CT requests were poor, but improved post-intervention. We have demonstrated that a simple educational intervention can improve adherence to existing guidelines, and help reduce unnecessary CT scans in TBI. There is still need for significant further improvement in our documentation. Further studies are also needed in our context to determine whether different guidelines might be more appropriate in our context than the ones we’re using.

References
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