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REGULAR FEATURE

Uchunguzi (Journal Watch/*Montre de Journal*)



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Uchunguzi means investigation in Swahili and provides a summary of some of the most recent international literature as presented in other leading journals, but with an emphasis on what is relevant to our continent.

Emergency care: a horizontal solution to rising vertical problems

The rising burden of non-communicable diseases (NCDs) – including cardiovascular diseases, poses a growing health challenge for sub-Saharan Africa (SSA) even as it continues to grapple with high burdens of communicable diseases, maternal and child health, and HIV; this is compounded by the rise in road traffic injuries (RTIs). Strokes and RTIs are already among the top 15 causes of years of life lost for all four SSA sub-regions, along with ischaemic heart disease, diabetes mellitus and hypertensive heart disease in Southern SSA. Moreover, Africa has the highest RTI death rate per population in the world and is the leading cause of premature death after HIV/AIDS among young men. This has been attributed to limited access to emergency care which may mean worse outcomes. Rather than addressing these conditions separately as vertical programs, this report from the World Bank suggests that there is scope for an integrated approach focusing on functions (prevention, treatment, and care) rather than on disease categories. The integrated nature of emergency care systems supports the progress towards strong health care systems (horizontal approach) and also increases the efficacy of already existing vertical programs by providing for the acute care needs of these patients. Prompt emergency care for RTIs and acute NCD events can not only save lives, but can also reduce the incidence of short-term disability and dramatically improve long-term consequences for patients and their families.

Reference: Marquez PV, Farrington JL. The challenge of non-communicable diseases and road traffic injuries in sub-Saharan Africa: an overview. Washington, DC: The World Bank; 2013.

Predicting severe disease in children with diarrhoea

There were 1.7 billion cases of diarrhoea in children in 2011, resulting in 36 million cases of severe disease and 700,000 deaths, or more than 10% of all child deaths worldwide. As the severity of diarrheal disease in children varies widely, accurately assessing dehydration status remains a crucial step in preventing mortality. No single laboratory test or clinical sign has demonstrated adequate sensitivity, specificity, and reliability for detecting severe dehydration in children. However, there are few tools available to help providers in resource-limited settings predict which children with diarrhoea are at risk for severe disease and require hospital admission and intravenous fluids. In a recent study conducted in Rwanda, the investigators compared the accuracy of three clinical scales, including the WHO severe dehydration scale, the CDC scale, and the Clinical Dehydration Scale for predicting severe disease in children with diarrhoea. Only the Clinical Dehydration Scale (Table 1) was a significant predictor of severe disease when used in infants, with an AUC of 0.77 (95% CI 0.61, 0.93), and when used by nurses, with an AUC of 0.78 (95% CI 0.63, 0.93).

Though the Clinical Dehydration Scale was derived in a high-income country, this study highlights its utility in a resource-limited setting to predict which infants with diarrhoea are at risk for severe disease and require hospital admission and intravenous fluids and it can be used by general practice nurses.

Reference: Levine AC, Munyaneza RM, Glavis-Bloom J, et al. Prediction of Severe Disease in Children with Diarrhoea in a Resource-Limited Setting. PLoS One 2013;8(12):e82386.

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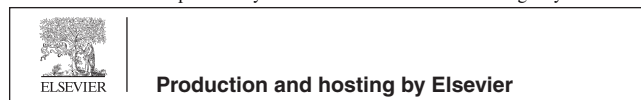


Table 1 The Clinical Dehydration Scale.

Characteristic	0 Point	1 Point	2 Point
General Appearance	Normal	Thirsty, restless or irritable	Lethargic or unconscious
Eyes	Normal	Slightly sunken	Very sunken
Mucous Membranes	Moist	Dry	Very dry
Tears	Tears present	Decreased tears	Tears absent

Adapted from: Parkin PC, Macarthur C, Khambalia A, et al. Clinical and laboratory assessment of dehydration severity in children with acute gastroenteritis. *Clin Pediatr (Phila)* 2010;**49**(3):235–9.

Cornstarch ultrasound gel

Ultrasound is an ideal imaging modality for low-resource settings. Its portability, ease of use, and varied applications make it appealing for many clinical settings throughout the developing world. Limitations to commercially available ultrasound gel in the developing world include availability and cost. Some clinics have ultrasound machines but are unable to perform the studies due to the on-going costs of the gel. Investigators in a recent study compared cornstarch-based gel versus commercially available gel as an acceptable coupling medium for ultrasonography. They mixed one part cornstarch (also known as corn flour in the United Kingdom) to ten parts water and cooked the mixture on medium heat while stirring continuously for 3–5 min or until the mixture began to thicken and was smooth and translucent in appearance. It was then placed in a recycled standard ultrasound gel bottle and allowed to cool before use. After review of the images obtained by the study investigators, there was no statistical difference in the proportion of images deemed to be of adequate quality: cornstarch-based gel = 0.97 (95% confidence interval [CI] 0.92–1.00) vs. commercially available gel = 0.85 (95% CI 0.75–0.94) ($p = 0.053$). The cornstarch gel was superior to commercial gel on all three image parameters: detail ($p = 0.002$), resolution ($p = 0.018$), and quality ($p = 0.013$). Cornstarch and water are ubiquitous ingredients in many parts of the world and extremely inexpensive. This gel may as well be the solution for emergency ultrasonography in low-resource settings.

Reference: Binkowski A, Riguzzi C, Price D, et al. Evaluation of a Cornstarch-Based Ultrasound Gel Alternative for Low-Resource Settings. *J Emerg Med* 2013 Nov 12 [Epub ahead of print].

Prehospital trauma care in developing countries

The World Health Organization estimates that 5.8 million deaths annually are attributable to injuries, 90% of which occur in developing countries. Lack of medical attention has been attributed to 30% of deaths at site and 80% of the remaining patients die within an hour of injury. As a result, governments in developing countries have been attempting to establish and strengthen prehospital emergency medical systems. This literature review looks at the objectives of prehospital trauma care i.e. the six key steps of the prehospital trauma care process: detection, reporting, response, on-scene care, care in transit and transfer to definitive care. It also provides

insights into the different levels of prehospital trauma care: first responder, basic and advanced prehospital trauma care. Some of the controversial interventions like “stay and play” versus the “scoop and run”, prehospital endotracheal intubation, prehospital fluid resuscitation and spine immobilization are also addressed. Due to great heterogeneity in the literature, firm conclusions are not drawn but the review provides useful information about the current status of prehospital trauma care in developing countries that will assist in the strengthening and expansion of prehospital trauma care in these countries.

Reference: Anand LK, Singh M, Kapoor D. Prehospital trauma care services in developing countries. *Anaesth Pain Intensive Care* 2013;**17**(1):65–70.

A futile cost

Advances in emergency medicine enable emergency physicians to save lives as well as prolong dying. However, many interventions often sustain life under circumstances that will not achieve an outcome that patients can meaningfully appreciate. Such treatments are often perceived to be futile by health care providers. Treatment that cannot achieve a patient’s goals or that simply maintains a state such as intensive care unit (ICU) dependence or permanent coma is contrary to professional values, inappropriately uses health care resources, and creates moral distress. The prevalence and cost of critical care perceived to be futile have not been prospectively quantified until now. In this study conducted in the US, researchers developed a common definition of futile care by convening a focus group of clinicians who cared for critically ill patients. On a daily basis for 3 months subsequently, they surveyed critical care specialists in 5 intensive care units at an academic health care system to identify patients whom the physicians believed were receiving futile treatment. One hundred and twenty-three patients were perceived to be receiving futile treatment, 84 of them dying before hospital discharge and 20 within six months of ICU care (six-month mortality rate of 85%), with the survivors remaining in severely compromised health states. The mean cost for one day of treatment in the ICU that was perceived to be futile was US\$ 4,004. With limited resources in the developing world, we need to constantly evaluate our care to ensure we remain focused on saving lives, not prolonging dying as we simply cannot afford it.

Reference: Huynh TN, Kleerup EC, Wiley JF. The frequency and cost of treatment perceived to be futile in critical care. *JAMA Intern Med* 2013;**173**(20):1887–94.

What is the oxygen saturation?

Hypoxaemia, a state of deficient oxygenation of the blood, often complicates serious illnesses in children and can indicate imminent death irrespective of primary admission diagnosis. Poor oxygenation often results from diseases affecting the cardiac and pulmonary systems in children, but can also occur in other diseases such as sepsis, meningitis, common neonatal problems, and other conditions that impair ventilation and gas exchange or increase oxygen demands. It is important to detect hypoxaemia in children needing admission, especially in the emergency units, because it is treatable and early treatment may reduce the risk of death. Investigators in Nigeria set out to determine the prevalence of hypoxaemia at admission and its relationship to age and primary diagnoses in seriously ill children admitted to the emergency unit. Hypoxia was

detected in 28.6% of admissions being prevalent in conditions like acute lower respiratory infections (ALRI) (49.2%), neonates (41.1%), septicaemia (22.6%) and malaria (14.4%). Nasal flaring (OR 3.86; 95% CI 1.70–8.74) and chest retraction (OR 4.77; 95% CI 1.91–11.92) predicted hypoxaemia in ALRI but not in non-ALRI. Allocation of more resources to pulse oximetry for the diagnosis of hypoxaemia may allow more accurate identification and monitoring of disease severity than is currently possible relying on clinical signs alone. Availability of effective oxygen delivery systems might also substantially reduce mortality in emergently ill children.

Reference: Orimadegun AE, Ogunbosi BO, Carson SS. Prevalence and predictors of hypoxaemia in respiratory and non-respiratory primary diagnoses among emergently ill children at a tertiary hospital in south western Nigeria. *Trans R Soc Trop Med Hyg* 2013;107(11):699–705.