

Paramedic Pediatric Medication Errors and High Reliability Solutions

Presented at: EMS Today February 25, 2016

Published by: UCLA Prehospital Care Research Forum

Abstract #: EMS16-04

Michael S. Wallace, BSHS, CCPM, NRP

Co-Investigator

Tennessee EMS for Children

Committee on Pediatric Emergency Care

michael2.wallace@tenethealth.com

Donna Tidwell, BS, RN, PM

Co-Investigator

Tennessee Department of Health - Division of EMS

donna.g.tidwell@tn.gov

Eric Powell, Ph.D., NRP

Study Director

Walters State Community College

eric.powell@ws.edu

Background: Reducing pediatric medication errors made by paramedics working under time sensitive and stressful circumstances is an on-going challenge. Various strategies have demonstrated positive results though serious mistakes still prevail. One method that offers immediate substantial improvement is to completely eliminate math and provide clinicians with the exact answers they need at the point of care.

Objective: To demonstrate paramedic potential for pediatric medication calculation errors and a method for improving performance by providing the answers to each possible equation. Methods. This quantitative research project was designed to study errors made determining weight-based pediatric drug doses by currently practicing paramedics with at least 2 years of experience. We defined a dosing error as >20% deviation from the precise weight-based calculation or Broselow™ Pediatric Emergency Tape equivalent. Clinicians were placed in a timed testing environment and challenged to determine doses in milligrams (mg), milliliters (ml) and physically demonstrate the correct (ml) with a syringe. Five different medications commonly used were chosen: epinephrine 1:10,000 for cardiac arrest, epinephrine 1:1000 for anaphylaxis, Dextrose 25% for hypoglycemia, magnesium sulfate for asthma and adenosine for SVT.

Results: 114 participants averaging 14.3 years of experience practicing at the paramedic level representing all eight Tennessee geographic EMS regions, completed the study. Phase one presented a patient weighing 9 kg and provided a Broselow™ Tape, pen, paper and a calculator if desired. Results: 81% accurate determination of dose weight value (mg), 35% accurate determination of volume (ml), 37% accurate demonstration of volume (ml) in a syringe. Phase two presented a patient weighing 22 kg and provided clinicians with RightDose© pre-calculated pediatric dosing charts for each medication regimen. Overall test results: 96% accurate determination of dose weight value (mg), 96% accurate determination of volume (ml), 93% accurate demonstration of volume (ml) in a syringe. Overall combined accuracy was 94% with a 1% over-dose error rate and a 5% under-dose error rate. Conclusions. Eliminating math and providing an easy to use resource with the exact answers for each possible calculation demonstrated significant improvements in accuracy over currently utilized resources and practices.