

Comparison of Two Length-Based Tape Systems for Pediatric Resuscitation

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Background: The use of a length/weight-based tape (LBT) for equipment sizing and drug dosing for pediatric patients is recommended in a joint statement by ACS and NAEMSP. The Broselow™ tape is widely used and accepted in hospital and prehospital settings. A new system, known as Handtevy™, allows rapid determination of critical drug doses without performing calculations. Our objective was to compare two LBT systems for accuracy of dosing and time to medication administration in simulated prehospital scenarios.

Methods: This was a randomized cross-over trial comparing the Broselow™ and Handtevy™ LBT. We enrolled prehospital paramedics providers (PHPs) and assessed baseline comfort level with the LBT and frequency of use. Participants performed 2 pediatric resuscitation simulations: cardiac arrest with epinephrine administration and hypoglycemia mandating dextrose. Participants repeated each scenario utilizing both systems with a change in patient age to prevent memorization of dose when switching between LBTs. Facilitators recorded the time to measurement with the LBT, time to identifying the dose, and time to administration. Errors in dosing were assessed by monitoring medication preparation and the volume administered via a hidden syringe.

Results: We enrolled 68 PHPs, (272 simulations). Median baseline comfort level with Broselow™ was 3 (Comfortable) compared to 1 (Not At All) for Handtevy™, and 52.9% reported using a LBT in the last year. For both epinephrine and dextrose, there was no difference in time to measurement with the LBT (13 vs. 14 sec) between Broselow™ and Handtevy™. There was also no difference in time to identifying the dose between LBTs (36.5 vs. 37 seconds). For epinephrine, the LBTs were similar in time to administration (88.5 vs. 95.5 sec) and accuracy (76% vs. 68%). Dextrose administration was significantly more accurate (85.2% vs. 31.8%, $p < 0.05$) with Handtevy™ compared to Broselow™ but also somewhat longer (218 vs. 172 sec). In a post-simulation survey, the majority of participants perceived the Handtevy system as faster (91.1%), more accurate (88.2%) and preferable (91.1%).

Conclusion: Handtevy™ LBT system is more accurate for dextrose administration compared to the Broselow™, preserving time to administration and accuracy of epinephrine in simulated prehospital scenarios. After comparison of both systems, the majority of PHPs indicate preference for the Handtevy™ system.