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**2016-2017 CAT Block 4**

**Reference Article**

Hashikawa, Juhn, et al. (2007, December). Does length-based resuscitation tape accurately place pediatric patients into appropriate color-coded zones? *Pediatric Emergency Care*, 23(12), 856-861.

**Introduction**

Length-based tape (LBT) was originally standardized using data from the 50% percentile of child data from the 1979 National Center for Health Statistics from the years 1963 and 1975. A review in 1988 and 2002 showed that LBT underestimated weight in children by an average of 0.5 kg, but was significantly worse in children weighing greater than 20 kg. With the increase rise in obesity in children, especially over the past 20 years, LBT may be underestimating weight in children, which could adversely impact pediatric resuscitation.

**Methods**

Cross sectional retrospective data from children previously enrolled in Rochester Family Measles Project was gathered. Height, weight, BMI, race, and sex from birth certificates, questionnaires, and medical records were standardized using a z-score of distribution. Children were divided into 3 age categories, birth, 4-6, and 10-12. The standard deviation difference between LBT and actual weight was measured. Children with incomplete data or heights greater than the maximum LBT measurement were excluded.

**Results**

544 birth records, 520 4-6-year-olds, and 143 10-12-year-old records were reviewed. Some children were included more than once if they bridged multiple age categories. There were no discrepancies between LBT weight and actual weight at birth. In the 4-6-year-old category, 70% were correct with an underestimation of 2 categories of 0.5% and 1 category of 19%. 10% were overestimated by 1 category, and 0.5% were over the LBT weight limit. In the 10-12-year-old category, 40.6% were correct with an underestimation of 1 category of 3.5%. 11.1% were overestimated by 1 category and 0.5% by 2 categories. 44.1% exceeded the LBT weight limit.

**Discussion**

LBT is a reasonable method of estimating children's weight for resuscitation, but has increasing error for children 10-12 years old and those weighing more than 25 kg. LBT is still accurate for resuscitation equipment as that is more dependent on height than weight. For children whose height exceeds the limit, as well as depending on physician judgment, a larger child weighing greater than 40 kg could be treated as a 'small adult' using adult weight based dosages. The safety and efficacy of this is unknown, as the FDA considers anything 80-125% of the actual dose to be within range, but no studies have been performed regarding the accuracy of this information

As the rates of obesity rise, the LBT will become increasingly inaccurate for weight based dosing of resuscitation medications, result in delay of appropriate care. The LBT could be updated with new standards and an additional category greater than 70 kg could be added for older children and teens. The limitations of this study are that it was a retrospective study, all the children are all from a single area, mostly white, and were only differentiated into 3 broad age categories with some children being included in more than 1 age group.

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