Sauder, B4 CAT

Weight Estimation Methods in Children: A Systematic Review

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Objective: Synthesized current literature regarding all published methods of pediatric weight estimation, with the goal of comparison of accuracy as often enough, critically ill pediatric patients are difficult to obtain standard weights on.

Methods: Literature review using PubMed, Web of Sciences, Google Scholar data bases as well as bibliographies of appropriate titles with exclusion of adult data and neonatal data. The data was examined with focus on estimated weight within 10-20% of actual weight.

Results: 131 studies were screened, and 80 fit topic parameters for review. Studies were from 1986-2016 and were compiled from 23 countries with predominance from US. Studies were mostly from clinics and EDs, although some were found from schools, survey data, day cares. Age-based formulae were inaccurate when adjusted for population ranges of overweight or underweight. Visual estimation by healthcare providers was found to be inaccurate. The Broselow has the benefit of being developed for US pediatrics, and may not be accurate in other settings.

Conclusions: Although there are multiple weight estimation systems for pediatrics (PAWPER, Nelson, Broselow), in the ED these systems may be too complex for everyday usage, and the overall literature suggests that parental estimation followed by length-based methods with adjustment for habitus are most accurate. Parental estimate was the most accurate, being with 10% of real body weight in up to 80% of cases.

Bottom Line: Ask the guardian, and if they look clueless or have no idea, start to reach for Broselow tape. Also think to yourself "does this child look slightly over or under the weight I would expect for their height?" and adjust based on the principles of PAWPER/Mercy if available in your hospital system.