Accuracy of Prehospital Weight Estimate in Children

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BACKGROUND

As medication dosing in children are solely based on weight, **accurate weight estimate** is critical in safe emergency medication administration in the prehospital arena. Weight estimate best practices include many different methods including Broselow tape, age-based method, and parents, however **EMS providers often use their guestimate**. In Dane County, there is no guideline for the method recommendation in weight estimates for children and the accuracy of weight estimate in children are unknown.

PURPOSE

The objectives of this QI project is to **evaluate current methods** and **accuracy of weight estimate** by EMS providers transporting pediatric patients to AFCH to help **develop an algorithm** for most accurate pediatric weight estimate by the EMS providers.

METHODS

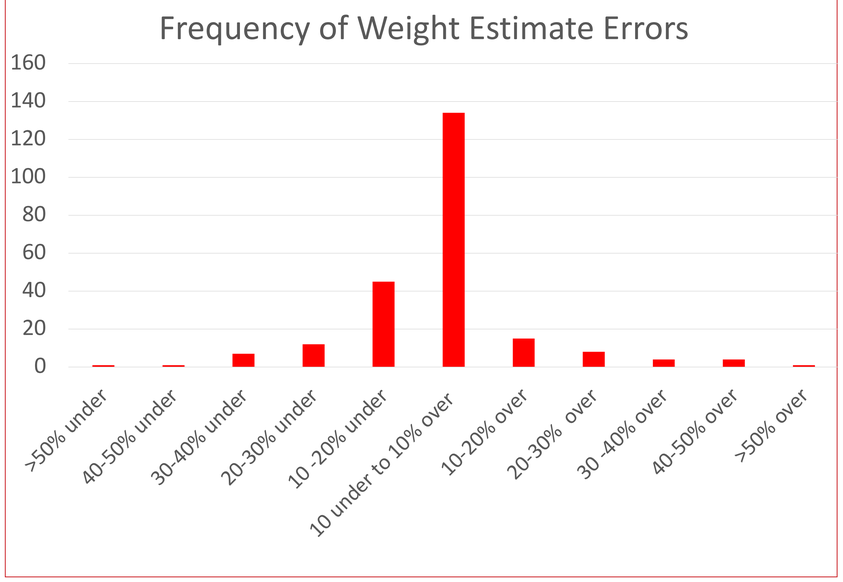
We utilized **mixed methods** to gather **convenient sampling** of weight estimates by the EMS providers. First method was by **directly asking the EMS providers** during the hand-off in the ED. In addition, some of the weight estimates were obtained during the **EMS report via radio** given prior to the ED arrival. ED measured weight was documented as the patient arrived or by review of ED charts of corresponding patients. In addition to the weight estimate, we also obtained the **source or method of the estimate**.

For each method, we then calculated **Percent accuracy: (**estimated weight ± ED measured weight) / ED measured weight x 100.
We also calculated proportion of patients with weight within 10% **(PW10)**: of ED measured weight (threshold is >70%) and proportion of patients with weight 20% (**PW20)**: percent of ED measured weight (threshold is >95%).

- Prehospital providers use varying methods to estimate weight in children.
- Guessing and age-based estimates are least accurate and should not be used.

RESULTS

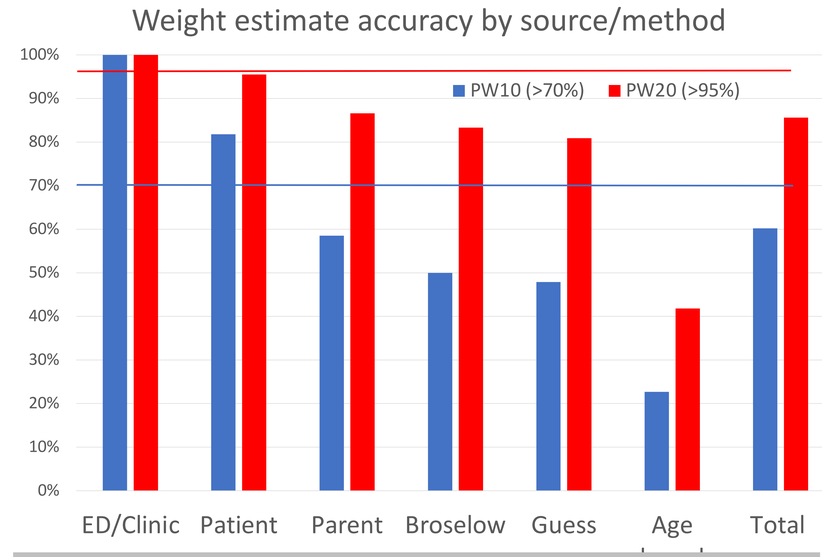
A total of 236 weight estimates were obtained over 9 months (7/21-4/22). The **mean age was 7.5 years**. 150/236 (**63.6%) was underestimation** compared to 79/236 (**33.5%) overestimation**.134/236 (**56.8%) were within 10 %** of the ED measured weight and 201/236 (**85.2%) were within 20%** of ED measured weight. The mean age for **>20% underestimate was 9.2 years** and **3.7 years in >20% overestimation**. The **PW10 was 61%** and **PW20 was 83.6%** for all weights obtained.



RESULTS

	n	Mean age (yrs)
ED/Clinic	11	
Patient	22	13.9
Parent	83	4.7
Broselow	12	6.7
Guess	48	8.4
Total	175	7.5

The **source/method of weight estimate** was obtained in 175 of the 236 patients.



Algorithm: When available, obtain estimates from parents or patients. If unable, use Broselow tape. No guessing or use age-based method.

CONCLUSION

Different methods are being used to estimate weight of children by EMS providers with varying accuracy.. Weight obtained from patients, parents or Broselow tapes were more accurate than guessing or using age-based system. Guessing or using the age-based system should not be used.

NEXT STEPS

- Implement the algorithm county wide
- Continue to assess the source and accuracy of the weight estimate

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