BACKGROUND
• A rapid and accurate weight of a child can be of critical importance for pediatric emergencies and resuscitations.1,2
• The Broselow Tape (BT) is the current gold standard for estimating a child’s weight based on their length.3
• There is a worldwide childhood obesity epidemic.4
• Studies have shown the BT is no longer accurate.5,6,7
• One study showed the BT has a >10% error almost half the time.8
• Technology should exist in the 21st century to safely and accurately determine a child’s weight.

OBJECTIVE
• To create a pediatric spine board capable of determining a child’s actual weight in an emergency setting.

METHODS
• Ethics approval from Western University
• Power calculation done for sample size to detect 10% error based on a previous published data set9
• Designed and built Ped-E-Board prototype using wood frame, aluminum plate and iHealth® Bluetooth bathroom scale (total cost ~$200)
• Consent from parents and assent from children >7 years old
• Exclusion criteria: <46.1cm, >146.6cm and non-English speaking
• Testing conducted in March 2014 in a community pediatrician’s office
• Actual weight and height measured wearing light-fitting clothes and no shoes by Dr. Lubell
• Ped-E-Board weight obtained by Mr. Milne
• Broselow Tape weight estimate done using the 2002A tape which incorporates the NHANES III reference intervals
• Statistical Analysis: MedCalc for Windows 98, Version 9.6.0.0
• Continuous data were assessed for normal distribution using the D’Agostini-Pearson test. Medians were reported with 95% confidence intervals
• Bland-Altman analysis was used to compare actual weight versus Ped-E-Board weight and BT-estimated weight
• The Spearman coefficient of rank correlation was also calculated

RESULTS
N=160 Children
Bland-Altman % Difference:
• Ped-E-Board 0.1% (95% CI 2.0 to 2.1%)
• BT 1.6% (95% CI -23.5% to 26.8%)

Spearman Coefficient of Rank Correlation:
• Ped-E-Board 0.999 p<0.001 (95% CI 0.999 to 1.000)
• BT 0.875 p<0.001 (95% CI 0.831 to 0.907)

N=160

<table>
<thead>
<tr>
<th>Median Weight</th>
<th>95% CI</th>
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</thead>
<tbody>
<tr>
<td>Ped-E-Board</td>
<td>18.8kg</td>
</tr>
<tr>
<td>Broselow Tape</td>
<td>19.0kg</td>
</tr>
</tbody>
</table>

LIMITATIONS
• No data on the smallest BT category (46-52cm)
• Durability of Ped-E-Board not tested (fluids, temperatures, impact, etc.)
• Reliability of Ped-E-Board not assessed

CONCLUSIONS
• Ped-E-Board was just as accurate as a pediatrician’s scale in determining the weight of a child.
• Ped-E-Board was more accurate than the weight estimated by the Broselow Tape.

REFERENCES