TISS-28 AND NAS: SCORE PERFORMANCE AND MORTALITY DISCRIMINATION IN A PAEDIATRIC INTENSIVE CARE UNIT

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• **Background:**
  – The Nursing Activity Score (NAS) was designed to evaluate the nursing workload in the intensive care unit taking into consideration time consuming nursing activities not necessarily related to severity of illness.

• **Objectives:**
  – We evaluated the performance of the NAS in comparison to the Therapeutic Intervention Scoring System-28 (TISS-28), and assessed their mortality discrimination capacity.
Method

- Prospective study from August 2008 to February 2009 in the PICU at Santo Antonio Children’s Hospital (Brazil).
- Daily assessment of NAS and TISS-28 were performed.
- We evaluated the performance of the scores at admission, the worse daily score, and the total score.
- The study was approved by our local Research Ethics Committee.
Results

- 545 admissions and 2951 observations were studied.

### Average of the values of TISS-28 and NAS on admission and at maximum value

<table>
<thead>
<tr>
<th></th>
<th>Calculated values (± SD)</th>
<th>Values in minutes (± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=545</td>
<td></td>
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<tr>
<td>TISS in admission - points</td>
<td>32,66 ± 12,18</td>
<td>1039 ± 397</td>
</tr>
<tr>
<td>TISS maximum- points</td>
<td>33,93 ± 12,71</td>
<td>1079 ± 404</td>
</tr>
<tr>
<td>NAS admission - points</td>
<td>58,80 ± 11,89</td>
<td>847 ± 171</td>
</tr>
<tr>
<td>NAS maximum- points</td>
<td>63,40 ± 12,71</td>
<td>913 ± 218</td>
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### Average of the total values of TISS-28 and NAS in points and

<table>
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<tbody>
<tr>
<td>N=2951</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TISS</td>
<td>28,79 ± 10,37</td>
<td>915 ± 330</td>
</tr>
<tr>
<td>NAS</td>
<td>55,67 ± 11,82</td>
<td>802 ± 161</td>
</tr>
</tbody>
</table>
Results

- TISS-28 provided higher time estimates when compared to NAS in all observations ($p<0.001$).

![Values of TISS-28 and NAS in minutes](chart)
Results

- Correlation when the scores were converted to time estimates (in minutes)

TISS X NAS
All 2951 observations

$R = 0.564$.  

TISS and NAS in admission (min)

$R = 0.680$

TISS and NAS maximum (min)

$R = 0.685$
Results

Bland–Altman plots for limits of agreement between TISS-28 and NEMS. Only 4.1% of measurements outside the 2 standard-deviation interval.
Results

The area under the receiver operator characteristics curve
At admission.
• TISS-28 = 0.79 (0.72-0.87)
• NAS = 0.84 (0.75-0.92)
Maximum scores
• TISS-28 = 0.87 (0.81-0.92)
• NAS = 0.99 (0.99-1.00)
PIM-2 = 0.91 (0.89-0.96)

TISS-28 and NAS showed good mortality discrimination
Conclusion:

• In our population, both TISS-28 and NAS showed good agreement.

• But TISS-28 provided higher time estimates than NAS.

• Both scores (at admission and maximum score) showed good mortality discrimination performance.