Real World Implementation of a Standardized Handover Program (I-PASS) on a Pediatric Clinical Teaching Unit

Author: Kathleen Huth
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I do not have an affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

Je n’ai aucune affiliation (financière ou autre) avec une entreprise pharmaceutique, un fabricant d’appareils médicaux ou un cabinet de communication.
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Huth K, Hart F, Moreau K, Baldwin K, Parker K, Creery D, Aglipay M, Doja A

Department of Pediatrics, University of Ottawa
Children’s Hospital of Eastern Ontario Research Institute
Background

- The ability to safely transfer patient care is an essential physician competency *(RCPSC CanMEDS 2015, ACGME 2014)*

- A handover training “bundle” (I-PASS) was associated with reduced medical errors and improved communication in a multicenter study *(Starmer et al., N Engl J Med 2014)*

- It is unclear whether adapting this model in clinical teaching units with less dedicated resources will result in improved handover quality
Research questions

• How does the I-PASS curriculum impact the quality of verbal and written communication during handover?

• Does using the I-PASS format for verbal handover increase handover duration in real-world implementation?

• Are patients with potential for clinical deterioration appropriately identified during handover, pre- and post-implementation of the I-PASS curriculum?
Study design

• Prospective intervention study in pre and post phases
  – Implementation of modified I-PASS curriculum

• Data collection and analysis:
  – Printed handover documents
    • Quantitative: inclusion of key data elements
  – Video-recorded afternoon handover
    • Quantitative: handover duration
    • Qualitative: content analysis
  – Critical care response team (CCRT) consults
    • Qualitative: document analysis
Results: *Quantitative*

- Sixty ward handover documents reviewed, comprising 364 unique inpatients and 1275 individual handover entries (median of two handovers per patient, IQR 1-4)
Less likely after IPASS curriculum  More likely after IPASS curriculum

<table>
<thead>
<tr>
<th>Condition</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergies</td>
<td>566.15 (105.28–3044.65)</td>
</tr>
<tr>
<td>Illness severity</td>
<td>476.96 (174.68–1302.36)</td>
</tr>
<tr>
<td>Past medical history</td>
<td>29.42 (13.2–65.57)</td>
</tr>
<tr>
<td>Weight</td>
<td>10.05 (6.44–15.66)</td>
</tr>
<tr>
<td>Contingency plans</td>
<td>6.86 (4.72–9.98)</td>
</tr>
<tr>
<td>IV access</td>
<td>5.23 (3.52–7.77)</td>
</tr>
<tr>
<td>To-do / action list</td>
<td>2.64 (1.93–3.6)</td>
</tr>
<tr>
<td>Name and MRN</td>
<td>1.59 (0.9–2.83)</td>
</tr>
<tr>
<td>Medication list</td>
<td>0.75 (0.41–1.38)</td>
</tr>
<tr>
<td>Investigation results</td>
<td>0.52 (0.26–1.04)</td>
</tr>
<tr>
<td>Physical exam findings</td>
<td>0.2 (0.11–0.39)</td>
</tr>
</tbody>
</table>
Results: **Quantitative**

- Fifty-three handover sessions were video-recorded (26 pre-intervention, 27 post-intervention)

- No significant change in verbal handover duration post-intervention (+1.7 minutes per ward, 95%CI [-2 to 5 minutes])
## Results: *Qualitative*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative Handover</td>
<td>Clarification of Details</td>
</tr>
<tr>
<td><em>The active exchange of information and ideas about patient care</em></td>
<td>Cross-Checking*</td>
</tr>
<tr>
<td>Handover Organization</td>
<td>Ordered information</td>
</tr>
<tr>
<td><em>The structure in which handover details are verbalized</em></td>
<td>Characterization of the Team</td>
</tr>
</tbody>
</table>

Sub-theme: *Clarification of Details*

**PRE**
*Receiver:* (after 25 seconds of verbal handover) How old is he?
*Giver:* Um, he is little... *(looking in notes)*... maybe one and a half months.
*Receiver:* Okay, that’s fine.

**POST**
*Giver:* *(completes handover)*
*Receiver:* So... If the IV falls out we’ll assess the culture, see if they’re back and either put it back in or switch to... Do you want us to switch to PO or just [discontinue antibiotics]?
*Giver:* No I would just [discontinue antibiotics].
Sub-theme: Cross-checking

**POST**

**Giver:** (completes handover)

**Receiver:** So... She is on epi and Ventolin and we can assess maybe this evening what’s better for her? ...we could get an objective measure and then we can continue [that medication]? 

**Giver:** (completes handover)

**Receiver:** ...And so if she deteriorates overall and it’s not necessarily resp, do you want to put her on [gentamicin] just to cover for the UTI?
Sub-theme: Teaching Opportunities

POST

**Giver:** (completes handover)

**Receiver:** So he really sounds like a “watcher”. *(To Junior Resident)* For overnight... the reason why I asked about the urine output is, if he’s pouring out urine, then it may be a sign of [diabetes insipidus], which can occur with meningitis, but we’ll keep a close eye on him.

**Giver:** And we could also... put some orders in the charts about both DI and SIADH too. If [urine output] less than 1 or greater than 4 [cc/kg/hour] in 4 hours, call MD... Any other questions?

**Receiver:** No, that’s good.
Sub-theme: Ordered Information

**PRE**
- Patient information provided in varying orders
- Repetition of basic details

**POST**
- I-PASS format
- Order consistency between presenters
Sub-theme:  
*Characterization of the Team*

**POST**  
**Giver:** On our team as I mentioned we have a couple of watchers, the sickest of which is room 11, which we will be getting to shortly, otherwise we'll run in order...
Critical care response team (CCRT) consults

- Four CCRT records in the pre-intervention period and five records in the post-intervention period were analyzed, as well as their respective handover documentation.
CCRT consults: Written handover entries

PRE

“Nasally congested and occ cough. New O2 requirement [Date], given epi neb”

“Admitted for observation... ongoing need for neb epinephrine...
“DC home in a.m. if no further need for racemic epi”
CCRT consults:  
*Written handover entries*

**POST**

“UNSTABLE... Monitor resp status. Hold feeds if [respiratory rate] >70”

“WATCHER... Consider culture if develops fever, consider port line infection. [Call Acute Pain Service] for pain control”
Limitations

- Generalizability
- Hawthorne effect
- Extension of identifying unstable patients to clinical outcomes was not evaluated
Conclusions

Real-world application of I-PASS handover is associated with:

- Consistent inclusion of key data elements
- Observable differences in collaboration and organization, without significant increase in handover duration
- Appropriate identification and prospective information for clinically deteriorating patients

Adaptation of the I-PASS model to settings with less dedicated resources is feasible and can improve handover communication
Next steps

• Impact on clinical outcomes

• Sustainability initiatives
Acknowledgements

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• The I-PASS Study Group
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