Recognition
and Management of Uncertainty In the Transitions of Patient Care

BY
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THESIS

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This thesis is dedicated to my husband, Barry, our daughter Laura Elizabeth and our son, Matthew Christopher, whose support of this work was unwavering.
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DEFINITION OF TERMS

**Content** – patient-specific information such as laboratory and radiologic data, elements of the history and physical examination, problem lists, and other explanatory or informational data present on the sign-out document.

**Handover** - the communication between two clinical providers wherein a transmittal of patient information takes place for the purpose of informing the provider to whom primary care of a patient is being transferred – often referred to as “sign-out” when a change of shift is occurring.

**Sender**- the intern who is transmitting information during a handover.

**Receiver** - the intern who is receiving information during a handover.

**Uncertainty** - refers to lack of confidence in one’s understanding of clinical knowledge or in the reasoning behind one’s decision-making.\(^1,2\)

**Sign-out document** – a printed document containing the salient patient-specific information deemed necessary for successful information transfer during the handover process. The sign-out document is populated in the Epic\(^\circledast\) Rounding Navigator; it is updated throughout the shift, and is printed shortly before the handover process begins.

SUMMARY

Purpose

Effective patient-care handovers between interns must be comprehensive enough to allow the receiving intern to construct a complete mental model of the patient’s current status, future care plan, and anticipated clinical events. Recipients of an effective handover should feel that no essential content has been omitted, and there is little uncertainty about that content, to be able to care effectively for their patients during a given shift. The purpose of this study was to determine the degree to which receiving interns, supervisory residents (SR) and nurses perceived missing handover content and intern uncertainty about that content. We also examined consequences of, and intern responses to, missing content and/or uncertainty.

Methods

Over a 3-month period in 2012, 9 night-shift interns, their 13 supervisory residents (SRs), and the nurses caring for their patients completed anonymous, constructed quantitative, and free-text surveys on 3 patients-cases per night, for 3 nights per week. The responses of these three parties with regard to intern missing patient information (content) and intern uncertainty (lack of understanding, relevance or contextual meaning) were triangulated and analyzed using McNemar’s Test for correlated proportions. Cross-covering SR responses were compared to primary-team SR responses to assess the influence of cross-coverage using Fisher’s exact test. The type of content missing, the perceived implications or consequences of that missing content, the nature of intern uncertainty and the actions taken in response to that uncertainty were reviewed by non-study participant faculty and residents; themes and exemplar responses were independently derived and reported.
**Results**

Data for 82 complete survey sets was collected during the study period. Handover content was considered missing by interns and/or their supervisory residents 33% of the time. Supervisory residents and interns agreed on the presence or absence of missing content 74% of the time. When they disagreed, interns were 3.2 times more likely to report missing content than their supervisory residents (McNemar’s Test, p = 0.013). Content was considered missing by interns and/or nurses 30% of the time. Nurses and interns agreed on the presence or absence of missing content 77% of the time. When they disagreed, interns were 5 times more likely to report missing content than nurses (McNemar’s Test p = 0.004). Uncertainty was reported by interns and/or their supervisory residents 39% of the time. Supervisory residents and interns agreed on the presence or absence of uncertainty 73% of the time. When they disagreed, interns were 4.5 times more likely to be uncertain than their supervisory residents reported they were (McNemar Test p = 0.002). There was no difference in the rate of uncertainty-reporting nor in the rate of resource-seeking between primary team and cross-covering supervisory residents (Fisher’s exact test p = 0.56 and p = 0.38 respectively). When interns recognized uncertainty, their recognition was prompted during the handover 48% of the time and during patient-care activities 39% of the time. Supervisory residents noticed intern uncertainty during handovers 40% of the time and during patient-care activities 40% of the time.

**Conclusion**

Supervisory residents and nurses were frequently unaware that interns felt they were missing handover content. Intern uncertainty about the nature of handover content also went underappreciated by supervisory residents and nurses, resulting in a suboptimal shared mental model of the team’s patients.
INTRODUCTION

Background

In 2003, the Accreditation Council for Graduate Medical Education (ACGME) instituted a mandatory 80-hour workweek aimed at reducing trainee fatigue. The intent of this mandate was to reduce the number of tired physician-trainees engaged in active patient care, thereby decreasing medical errors and increasing patient safety. However, the effects of this duty-hour restriction have been mixed.\(^1\,^2\) While some studies report a decrease in medical errors with the advent of the 80-hour workweek, others have found increases in medical errors, as shortened resident shifts have led to a loss in continuity of patient care, and as handover frequency has increased.\(^3\) In 2011, the ACGME required an even greater reduction in resident duty hours, with interns limited to working no more than 16 consecutive hours with a mandatory 10-hour break between shifts.\(^4\) This change has necessitated yet another increase in the number of patient handovers per day\(^5\) and has decreased the resident-reported ownership of patient care responsibilities.\(^6\) The resulting loss of continuity of care has been associated with increased medical errors\(^7\)-\(^13\).

Several studies\(^14\)-\(^26\) have cited incomplete content transfer as a significant cause of inadequate handovers. These studies have focused on developing reproducible processes (e.g., checklist creation) to ensure the fidelity of handover content transmitted between care providers.\(^27\,^28\) In addition to omissions in the transfer of content, receiver uncertainty about the nature of the handover content itself is another important source of handover inadequacy. A receiver may not fully understand the relevance of the content transferred, or they may not be confident with the degree of their own understanding of the information they have received. During the handover process, residents functioning as the sender or as the receiver may have critical knowledge gaps of which they are unaware,\(^29\)-\(^32\) resulting in unintended omissions in content transfer on the part of...
the sender and in uncertainty about the nature of handover content on the part of the receiver. If content gaps or uncertainty about the relevance of content, are not addressed during resident sign-out, critical understanding of the patient’s status and care plans may be lost. The uncertain receiver is ill prepared to manage both anticipated and unanticipated patient care events and is only incompletely able to communicate effectively with care team members, including the patient’s family.\textsuperscript{33}

The recipient of an inadequate patient handover goes into their clinical shift with a necessarily incomplete mental model of the patient in his or her care.\textsuperscript{34} As Mathieu et al. defined them, mental models help individuals “describe, explain, and predict events in their environment,” and inform decision-making as environmental conditions change.\textsuperscript{35} The theory of shared mental models is predicated on the ability of team members to “draw on their own well structured knowledge as a basis for selecting actions that are consistent and coordinated with those of their teammates.”\textsuperscript{35} In the context of patient care handovers, such knowledge-based decision-making can only be performed if handover information is both precise and thorough, including not only the data needed to care for a patient, but the reasoning behind the relevance of that data in the context of a given patient.

Developmentally appropriate limitations in cognition may make it impossible for new physician-trainees to recognize their own uncertainty when faced with complex handover information. Even when interns do recognize uncertainty in themselves, they may not openly express their lack of comprehension and may fail to seek input from their supervisors, preferring self-directed modes of inquiry, such as internet searches to augment their understanding. Farnan et al. referred to this lack of advice-seeking from supervisors as adherence to a “hierarchy of assistance”.\textsuperscript{36} Resident
uncertainty regarding the clinical status of their patient has been reported to result in both excessive testing\textsuperscript{37} and unnecessary care,\textsuperscript{38} which in some cases may lead to patient harm.
CONCEPTUAL FRAMERWORKS APPLIED

Bloom\textsuperscript{39} described a hierarchy of learning that illustrates the developmental progression required to inform decisions. Applied to the setting of handovers, the white boxes in Figure 1 demonstrate that successful medical decision-making requires the necessary, but not sufficient, condition of comprehensive patient care data (content) transfer.

![Hierarchy of Learning](image)

Figure 1. Hierarchy of learning from Bloom’s Taxonomy of Learning.\textsuperscript{39}
Certainty about that content requires that the receiver be able to identify connections between his or her abstract understanding of pathophysiology and the data presented to him or her within the unique context of a given patient. Beresford described the inability to make these connections as “conceptual uncertainty” and noted that it is the most common category of physician uncertainty leading to impaired clinical decision-making. Kennedy notes that the ability to recognize one’s own uncertainty is a type of discernment, which she defines as “a trainee’s awareness of the limits of his or her clinical knowledge and skill.” Further (and importantly for residents acquiring increased responsibility as they progress through their training), Kennedy cites discernment as one of the grounding elements of “trustworthiness” (along with truthfulness, knowledge, and conscientiousness).
We set out to determine the frequency of missing content in intern-to-intern handovers, as well as the rate of uncertainty among interns receiving handover content. We also set out to examine intern responses to their own uncertainty about handover information. In achieving these goals, we sought input from the (receiving) interns themselves, from their supervisory residents, and from their nursing colleagues.

**Specific questions addressed:**

1. Was handover content missing? If so, what type of content was missing? What differences in missing content were reported by interns, supervisory residents and nurses on the same team? What, if any, implications or consequences due to missing content were anticipated or realized? Were the perceived implications or consequences of missing data different among interns, supervisory residents and nurses?

2. Was there any uncertainty about the content transferred? If so, *when* was that uncertainty recognized? *What or who* prompted recognition of this uncertainty? What, if any, implications or consequences of this uncertainty were anticipated or realized? Were the perceived implications or consequences of uncertainty different between interns and their supervisors?

3. What, if any, resources were sought to resolve uncertainty? Who (intern/ supervisory resident/nurse) initiated that resolution and what source (person, data source) did interns use in seeking resolution? What differences were reported in the resolution behaviors of different reporting parties (interns/supervisory residents/nurses)?
METHODS

Context: pre-study institutional handover activities

The institution in which this study took place developed an electronic health record-based handover tool seven months prior to the start of survey distribution. During orientation to the residency program 6 months prior to study initiation, new interns participated in a 90-minute session during which they were trained in performing handovers using this EHR-based tool. For this curriculum, three standardized cases were developed for which new interns had the opportunity to role-play both senders and receivers of handovers. For each case, interns worked in teams of three with a sender, a receiver, and a third intern who was given an assessment tool with which to evaluate his/her colleagues’ handover performance. Cases (authored by PJH) were constructed with input from supervisory residents and from chief residents to ensure their readability and authenticity. Cases were designed to highlight intern awareness of gaps in their own knowledge or understanding, to encourage them to ask questions when faced with such knowledge gaps, and to build foundational skills in the critical aspects of handovers. After each case’s role-play, trained faculty and resident facilitators worked with each trio of interns to debrief, to synthesize their reactions to the case, and to compile their thoughts on lessons learned and on how they anticipated these lessons would affect personal changes in handover behavior for the coming year.

Case A illustrated the importance of elaborating on clinical information and of making explicit statements in the list of to-do tasks given to the receiver: if X occurs, then take action Y, because of (rationale) Z. In the role-play of this case, the intern acting as the sender read a script in which a large amount of content was transferred, but without explicit clinical decision support statements underlying the to-do tasks associated with the case. When asked to summarize the
content transferred to them in this inexact way, interns acting as the receiver uniformly failed to recognize a key clinical risk for the patient being described. However, both the interns acting as sender and those acting as receiver denied having any uncertainty about the case when asked by the intern acting as observer – the interns simply did not know what they did not know. When this same case was used with supervisory residents, each resident identified key features of the patient history that would be important for the patient’s management; supervisory residents had an understanding about the meaning of the data transmitted that was not present when the same content was transferred to an intern. Thus, Case A emphasized that for new interns, the lack of depth and of interrelatedness of their nascent clinical knowledge is an inherent obstacle to high-quality handover performance.

Case B illustrated the importance of asking clarifying questions when uncertainty is recognized during the handover process. The sender in this case presented a complex patient history with a worrisome clinical status and a complex plan of care; the sender was scripted to do so rapidly and in a confident, all-knowing manner. Receiver interns uniformly asked very few clarifying questions about the cryptic sign-out that they had received. When the observers in the trio asked receivers if they felt they had all the information needed to care confidently for that patient, the consensus was that the sender had not given a clear or comprehensive handover. In debriefing Case B, both the sender and the receiver were empowered to participate in comprehensive content transfer by asking clarifying questions and by seeking to confirm a shared understanding or mental model of the patient’s pathophysiology and plan of care. Case B also underscored the importance of maintaining an institutional culture that supports cross-checking and inquiry over appearing self-sufficient and all-knowing.
Case C was designed to demonstrate the step-wise integration of a patient’s history and care plan into the electronic sign-out document. However, only supervisory residents are charged with populating the electronic document until six to eight months into the academic year.

**Study design**

This is a prospective, observational study using anonymous surveys to collect data from interns, their supervisory residents (SR) and the nurses caring for their patients. The purpose of this study was to explore the behaviors of interns in recognizing and responding to both missing handover content and uncertainty in handovers. These behaviors were examined from the interns’ own perspective, as well as from the perspectives of their supervisory residents and of the nurses assigned to the same patient cases. Triangulation of data from these three sources was applied in an effort to strike a balance between feasibility and meaningfulness in data gathering of outcomes.\(^{43}\) Institutional review board approval for this study was obtained from IRBs at the Children's Hospital of Philadelphia and at the University of Illinois at Chicago.

**Setting**

The setting for this study was an inpatient service at a large freestanding children’s hospital where a combination of hematology, immunology, and general pediatrics patients was admitted. The turnover for the service was high and the acuity moderate. The study began in January of 2012 and extended into March of 2012 – representing one of the busiest seasons of the year for admissions and for rapid turnover of patients. During each 4-week rotation, 2 supervisory residents and 4 interns provided daytime coverage for the study team; 13 supervisory residents and 9 interns participated in the study over the 3 months. Nighttime supervisory coverage was provided on an every-fourth-night call schedule with half of the nights shared by the team’s two
primary supervisory residents, and half of nights covered by supervisory residents assigned to a
different team during the day. Thus, every-other-night supervision was provided by a cross-
covering resident. Intern night coverage was staffed by a night-float system with a single intern
caring only for the patients on their primary team for six consecutive nights, thus ensuring no
intern cross-coverage of patients. Interns spent the remainder of their four-week rotation
providing daytime coverage for the same primary team. Bedside nursing providers were
experienced nurses with active participation in process improvement projects on a consistent
basis.

Handovers occurred at several times throughout the day. Interns leaving for their continuity clinic
would handover care for their patients to their co-interns shortly after morning rounds. Two of the
remaining three daytime interns would sign out to the third in the late afternoon. Finally, the
remaining daytime intern would sign out to the night intern upon his or her arrival for the night
shift. It is this final evening sign out that the night intern—the receiver of that last handover—
was asked to evaluate on the study survey. Of note, it was usual practice for handovers among
supervisory residents to take place in a different location, and often at a different time than that of
the interns caring for the same patients.
Figure 2: Team schedule of handovers.

Multiple handovers occur prior to the long-call Day Intern (Sender) conducting the handover to the Night Intern (Receiver).
**Instrumentation**

Through a series of iterative focus group discussions, interns, supervisory residents and nurses participated in the development and formatting of the survey instruments used in the study. Each of these groups was also represented in the development of the practice case used to train study participants. A focus group comprised of interns participated in the development of the content and layout of the intern study surveys and supervisory residents and nurses participated similarly. Survey instruments were designed to have a series of checklists, with branching details and open-ended items with corresponding textboxes. Separate instruments were developed for interns, supervisory residents and nurses (Appendices A-C).

**Training of participants**

Nurse training for the study took place in a stepwise fashion wherein the nurse educator for the unit—who had been involved in the development of the training case (Appendix D)—trained first the nurse manager and charge nurses of the unit. They in turn educated individual bedside nurses on completion of the study form. During training sessions, nurse participants reviewed the training case and listened to pertinent features of the patient’s history and physical as well as a recap of the “night’s events” for that patient. Once they had heard this information, they were given an orientation to the layout of the study form itself and were given an opportunity to complete the form based on the details of the case they had heard. After completion of the survey, nurse participants discussed what they had chosen to write and explored their response variation to ensure a consistent group understanding of how to complete the form. Training case surveys were destroyed at the end of the session.
Training for interns and supervisory residents in completion of study forms was conducted by study personnel and by participant role. Residents and nurses were trained in the completion of study forms within a week of participating in the study.

**Timeline and procedures**

The study took place over a 12-week period of which 2 weeks and 2 additional days were omitted due to holidays or other resident-specific scheduling issues. Three patient cases were selected for study inclusion on Mondays, Wednesdays and Thursdays for a total of nine cases per study week. Eligible cases were reviewed by a study coordinator in consultation with a supervisory resident not on call that night to assure that the patients in question were not being discharged before the morning. Varying alphabetical sorting was then used to select patients from amongst the eligible pool determined earlier in the day. A study coordinator used a standardized protocol (Appendix E) to distribute survey forms to the night’s intern, supervisory resident and nurse after intern-to-intern sign-out had been completed. Each study participant carried his or her survey form and sign-out document throughout the night, completed the surveys over the course of the shift, and turned them into the study coordinator prior to leaving in the morning. For the purposes both of protecting anonymity and of facilitating longitudinal follow-up, interns and supervisory residents were assigned a random number in lieu of identification by name. Individual nurses were not tracked throughout the study, as there was little consistency of duty assignment. The study coordinator removed all patient identifiers prior to collection of study paperwork (printed sign-out forms and surveys). Data from completed surveys was entered into a database by case number and study day and was verified by study staff/authors (PJH and AKW).

**Data Analysis**
**Data Analysis**

The primary unit of analysis was the case (handover and associated overnight events).

McNemar’s Test for correlated proportions,\textsuperscript{44} using calculations from Vassarstats,\textsuperscript{45} was used to assess the significance of the differences between two correlated proportions for matched-pair cases where interns and supervisory residents independently assessed intern missing content and intern uncertainty. Data from Appendices F and G and Appendices H - K were used to construct 2x2 contingency tables. Binomial probability was used in calculating McNemar’s Test for correlated proportions. Odds ratios for discordant results from the different participant groups were calculated along with 95% confidence intervals. Fisher’s exact test was used to assess the systematic association between a supervisory resident’s status as either cross-covering or primary coverage and their report of intern missing content and of intern uncertainty. Text responses associated with pre-determined survey categories were reviewed and reported as illustrative examples.
RESULTS

Survey completion rates:

During the 12-week study period, completed surveys were collected 3 nights a week for 3 cases per night. Due to absence of study coordinator availability and to unanticipated patient discharges during the night, 89 total cases were available for the study. For these 89 cases, receiving interns completed surveys in every case for a completion rate of 100%; 82 supervisory residents handed in survey forms for a completion rate of 92%; 86 nurses filled out survey forms, for a completion rate of 97%. There were 82 cases for which all three respondent groups completed surveys. Distribution of cases by reporter role is listed below in Table I.

**TABLE I**
CASES OF INTERN MISSING CONTENT BY REPORTER ROLE

<table>
<thead>
<tr>
<th>Reporters of Missing Content</th>
<th>Total Number of Cases with Missing Content (out of 82 completed cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intern, SR, Nurse</td>
<td>1</td>
</tr>
<tr>
<td>Intern, SR only</td>
<td>5</td>
</tr>
<tr>
<td>Intern, Nurse only</td>
<td>2</td>
</tr>
<tr>
<td>SR, Nurse only</td>
<td>0</td>
</tr>
<tr>
<td>Intern only</td>
<td>14</td>
</tr>
<tr>
<td>SR only</td>
<td>5</td>
</tr>
<tr>
<td>Nurse only</td>
<td>7</td>
</tr>
<tr>
<td>No missing content reported</td>
<td>48</td>
</tr>
</tbody>
</table>
**Intern Missing Content**

Interns reported that there was **missing handover content** for 23 (26%) of the 89 cases (Appendix F) and 22 of the 82 cases with complete data. Among the 82 cases with complete survey data, there were 55 handovers in which both interns and supervisory resident residents agreed there was no missing content, 6 for which both interns and supervisory residents reported missing content, 5 in which interns reported no missing content but their supervisory residents believed there was missing content and 16 for which interns reported missing content but their supervisory residents did not. Handover content was considered missing by interns and/or their supervisory residents 33% of the time. Supervisory residents and interns agreed on the presence or absence of missing content 74% of the time. When interns and residents disagreed on whether content was missing, interns were 3.2 times more likely (95% CI [1.17-8.74]) to report missing content than their supervisory residents (McNemar’s Test p = 0.013, Table II).
TABLE II.
McNEMAR’S TEST\textsuperscript{1}. INTERN V. SUPERVISORY RESIDENT
(MISSING CONTENT)

<table>
<thead>
<tr>
<th>Supervisory Residents</th>
<th>Interns</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes, Missing Content</td>
<td>No, Missing Content</td>
<td></td>
</tr>
<tr>
<td>Yes, Missing Content</td>
<td>6</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>No, Missing Content</td>
<td>16</td>
<td>55</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>60</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>27%</td>
<td>73%</td>
<td></td>
</tr>
</tbody>
</table>

Odds ratio: $16/5 = 3.2$, with 0.95 confidence interval $[CI = 1.1723-8.7351]$ 

$P_A = 11/82 = 0.135$

$P_B = 22/82 = 0.268$  
Difference (unassigned) = 0.1342

McNemar’s Test Result:

Two-tail = 0.026604

One-tail = 0.013302

Conversely, of the 82 cases for which supervisory residents completed surveys, there were 11 (13%) where the supervisory resident reported that interns were missing handover content (Appendix G). For these 11 cases, 6 (55%) interns also reported awareness of missing content. For three of the remaining five cases, interns reported that they had no missing handover content, but that they did experience uncertainty with regard to the sign-out information they had been given on those cases (Appendix L). Of note, for 2 of the 11 cases where supervisory residents reported that their interns were missing handover content, the interns themselves reported neither missing content in, nor uncertainty about, the information transmitted in the evening sign-out. When supervisory residents reported that their intern was missing handover content, both interns and supervisory residents generally agreed on the implications or potential consequences of that missing content. However, interns and their supervisors often categorized the types of missing content differently.

Interns could report more than one type of missing content per case. Of the 23 total cases where interns reported missing handover content, 3 (13%) were classified as missing laboratory data or plans; 7 (30%) were missing historical or hospital course information, 5 (22%) were classified as missing physical examination or clinical status information, 2 (9%) were missing or inaccurate imaging reports, 4 (17%) were reported to be missing information about communication with care team members, and 6 (26%) were classified as missing aspects of the care plan or related details. In addition to noting the type of handover content missing for these 23 cases, interns reported on the implications (either anticipated or realized) of these content omissions for their ability to provide safe and effective patient care. See Table III.
Table III
Nature of Intern-identified Missing Content and Corresponding Anticipated or Realized Implications

<table>
<thead>
<tr>
<th>Type of Content Missing</th>
<th>Number* of Cases where Content was Missing</th>
<th>Percentage * of 22 Intern-identified Missing Content Cases</th>
<th>Anticipated or Realized Consequences Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>3</td>
<td>14</td>
<td>- Labs were not discussed during sign-out, however plan/lab schedule was discussed</td>
</tr>
</tbody>
</table>
| History/Hospital Course | 7                                          | 32                                                       | - Didn't have seizure description from seizure occurring 2/15  
- IV placement under U/S, repeated losing IVs, lost IV again, IV team refused to replace it  
- Unaware of behavior issues one night prior |
| Physical Exam/Clinical Status | 5                                          | 23                                                       | - Patient not improving clinically and I was forced to make clinical judgments with limited information about patient's history  
- Unclear how patient looked here and status of episodes |
| Imaging Reports         | 2                                          | 9                                                       | - I was unfamiliar with previous AXRs for patient, who is suspected of having an SBO  
- By report, NG tube in place on KUB, on my check was past the pylorus |
| Communication/Consult   | 4                                          | 18                                                       | - ID consult recs: couldn’t tell parents plan; unsure of diagnostic theory  
- Emergent need for disimpaction versus notify to wait until AM  
- Giving med not frequently enough because change in parents’ expectations based on discussions during rounds |
| Other                   | 6                                          | 27                                                       | - I was unfamiliar with previous AXRs for patient, who is suspected of having an SBO  
- Holding dose of medication that could have been potentially important due to adverse reaction with another med  
- Medication schedule was unclear, which was initially clarified in sign-out, but then became an issue later on that night  
- Plan for additional workup  
- Plan for home. Couldn’t answer question re: fluid restriction  
- Plan. Just better if I understand long term plan because I often get questions overnight  
- Unknown which AM labs needed to be drawn |
**Nurse Report of Intern Missing Content**

Like interns, nurses could report more than one category of missing content for each case. Nurses reported that the overnight intern was missing handover content in 10 of the 89 cases studied (11%) and 10 of the 82 cases with complete data (12%). Of these 10 cases, 2 (20%) were categorized as missing information regarding family communication; 1 (10%) case was missing information about the patient’s clinical status; 2 cases were characterized as missing patient history that had been present in nurse-to-nurse handover; 1 case had incomplete lab order information; 1 case did not include a pertinent consultation report, and 5 others were incomplete with regard to the patient’s care plan. For 1 of these 10 cases (case 19), the supervisory resident agreed with the nurse that the intern was missing handover content; however, the supervisory resident and nurse disagreed on the categorization of the missing content in that case. For 3 of the above 10 cases, interns agreed with nurses both that handover content had been missing, and on the type of missing content. See Table IV below.
<table>
<thead>
<tr>
<th>Type of Content Missing</th>
<th>Number* of Cases where Content was Missing</th>
<th>Percentage* of 10 Nurse-identified Missing Content Cases</th>
<th>Nurse Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication with Family</td>
<td>2</td>
<td>20</td>
<td>- Dad asking for what changes in apheresis plan- RN not aware that dad did not know change to 5d/week -abdominal x-ray results and plan of care</td>
</tr>
<tr>
<td>Assess or Re-Assess</td>
<td>1</td>
<td>10</td>
<td>- anticipated gen surg plan for penrose drain, pain management, cultures</td>
</tr>
<tr>
<td>Pertinent Piece of History</td>
<td>2</td>
<td>20</td>
<td>- went to OR today having throat pain upon return - Patient febrile to 39.1. Though patient not afebrile for greater than 24 hours, team desired to obtain another blood culture.</td>
</tr>
<tr>
<td>Pertinent Lab Value</td>
<td>1</td>
<td>10</td>
<td>- dipsticks ordered every other feed</td>
</tr>
<tr>
<td>Pertinent Radiologic Finding</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Pertinent Consultation Report</td>
<td>1</td>
<td>10</td>
<td>- anticipated gen surg plan for Penrose drain, pain management, cultures</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>50</td>
<td>- treatment plan for patient, discharge goals, possible diagnosis - DDAVP not ordered for 8am - went to OR today having throat pain upon return - plan for 1/26... Continue or transition to PO abx and go home?</td>
</tr>
</tbody>
</table>
Content was considered missing by interns and/or nurses 30% of the time. Nurses and interns agreed on the presence or absence of missing content 77% of the time. When they disagreed, interns were 5 times more likely (95% CI [1.44 - 17.27]) to report missing content than nurses (McNemar’s Test $p = 0.003769$). See Table V.

**TABLE V**  
McNEMAR’S TEST$^1$: INTERN V. NURSE

<table>
<thead>
<tr>
<th></th>
<th>Interns</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes, Missing Content</td>
<td>No, Missing Content</td>
<td></td>
</tr>
<tr>
<td>Interns</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses Yes, Missing Content</td>
<td>15</td>
<td>57</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No, Missing Content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>60</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>27%</td>
<td>73%</td>
<td></td>
</tr>
</tbody>
</table>

Odds ratio: $15/3 = 5$, with 0.95 confidence interval [CI = 1.4475 - 17.2714]

$P_A = 10/82 = 0.122$

$P_B = 22/82 = 0.2683$  
Difference (unassigned) = 0.1463

McNemar’s Test Result:

Two-tail = 0.007538

One-tail = 0.003769

Intern Uncertainty

Interns reported recognition of uncertainty with regard to handover information in 31 of 89 cases (35%) and 28 of 82 cases with complete data (34%). For each case, interns could cite more than one moment or interaction that prompted their uncertainty recognition. Interns reported that for 15 of 31 cases (48%) uncertainty was recognized during sign-out itself; for 12 cases (39%), it was noticed while performing patient care; in 7 cases (23%), uncertainty was recognized during interactions with nurses; for each of 3 other cases, uncertainty was recognized: during midnight rounds, during conversation with a supervisory resident, and in thinking further about the patient. See Appendix H.

Of the 28 complete cases for which interns recognized uncertainty, there were 10 (36%) where the supervisory residents were also aware that the interns had uncertainty. Supervisory residents identified intern uncertainty during sign-out in 4 (40%) cases, while performing patient care in 4 cases (40%), during interactions with a nurse for 1 case (10%), while communicating with a parent for 1 case (10%), and while interpreting laboratory data for 1 case (10%). For both interns and supervisory residents, sign-out and patient-care were the most common prompts for the recognition of intern uncertainty. See Appendix J. Of note, for the 28 cases where interns recognized uncertainty about handover information, in 18 (64%) cases supervisory residents were unaware of this uncertainty.

Interns reported no uncertainty with regard to handovers for 58 (65%) of the 89 cases. For 50 (86%) of those 58 cases, supervisory residents agreed that their interns had no uncertainty about the sign-out they had received. However, for 4 (7%) of the 58 cases where interns reported no uncertainty, supervisory residents reported that in their estimation, their interns seemed uncertain about the content of the evening’s sign-out. For these cases, supervisory residents recognized
Intern uncertainty during sign-out for two cases, and during patient care for another two (Appendix I).

Supervisory residents reported *awareness of intern uncertainty* in 14 of 82 cases (17%). For 10 of these 14 cases, the interns themselves also reported recognition of uncertainty. Interns reported noticing this uncertainty during sign-out in 5 cases (50%), during patient care encounters in 3 cases (30%), during encounters with nurses for 2 cases (20%), while talking with a parent for one case (10%), during midnight rounds for 1 case (10%) and in discussion with a supervisory resident for 1 case (10%; Appendix H).

Conversely, supervisory residents reported *no intern uncertainty* for 68 of the 82 cases for which they completed surveys (83%). In 18 of these 68 cases (26%), interns reported that they did experience uncertainty with regard to handovers. These interns recognized this uncertainty during sign-out in 9 cases (50%), during patient care in 7 cases (39%), during nurse interactions in 3 cases (17%) and in 1 case (6%), when thinking to themselves. See Appendix K.

Uncertainty was reported by interns and/or their supervisory residents 39% of the time. Supervisory residents and interns agreed on the presence or absence of uncertainty 73% of the time. When they disagreed, interns were 4.5 times more likely (95% CI [1.52 – 13.29]) to be uncertain than their supervisory residents reported they were (McNemar Test p = 0.002). See Table VI.
TABLE VI
McNEMAR’S TEST: INTERN V. SUPERVISORY RESIDENT (UNCERTAINTY)

<table>
<thead>
<tr>
<th>Supervisory Residents</th>
<th>Interns</th>
<th>Yes, Uncertainty</th>
<th>No, Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Yes, Uncertainty</td>
<td></td>
<td>14</td>
<td>17%</td>
</tr>
<tr>
<td>No, Uncertainty</td>
<td></td>
<td>18</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>82</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>34%</td>
<td>66%</td>
</tr>
</tbody>
</table>

Odds ratio: 18/4 = 4.5, with 0.95 confidence interval [CI = 1.5229 – 13.2966]

\[ P_A = \frac{14}{82} = 0.170 \]
\[ P_B = \frac{28}{82} = 0.341 \]

\[ \text{Difference (unassigned)} = 0.1708 \]

McNemar’s Test Result:

Two-tail = 0.004344
One-tail = 0.002172

Intern uncertainty types were reviewed for themes, using the conceptual framework provided by Beresford and Farnan. Uncertainty was categorized based on when the intern recognized it. For 15 of the 31 cases (48%) where interns felt uncertain, recognition of that uncertainty occurred during the handover itself. “To do” or task-related areas of uncertainty were also recognized during the handover process, and were reinforced by prompting again during patient care activities. Patient care activities were the primary prompt for the recognition of intern uncertainty for 12 (39%) of the 31 cases, with the secondary prompt of nurse discussion contributing to 2 of those 12 cases. Where recognition of uncertainty was prompted by patient care and/or nursing discussions, such cases were characterized by incomplete intern understanding of the rationale for a patient’s care plan. Patient-care activities and nursing discussions were also the primary prompts for recognition of uncertainty about in-depth clinical decision support questions rooted in the patient’s clinical context. Of the types of uncertainty defined by Beresford, “conceptual uncertainty” was the most commonly reported type of uncertainty in our study. See Table VII.
TABLE VII
INTERN AREAS OF UNCERTAINTY BY TYPE OF PROMPT

<table>
<thead>
<tr>
<th>When prompted</th>
<th>Areas of Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>During handover itself</td>
<td>plan for GCSF: should we give even if ANC increased. Hadnt realized to ask that question - dont think that the intern signing out to me had either</td>
</tr>
<tr>
<td></td>
<td>Patient's history is very complex, so historical progression of illness was not clear upon signout, however patient was a recent admission so clarity was not 100% possible in my opinion.</td>
</tr>
<tr>
<td></td>
<td>seizure frequency at baseline, when to intervene</td>
</tr>
<tr>
<td>During patient care delivery</td>
<td>plan of action for new fever not communicated - I asked for clarification during sign-out</td>
</tr>
<tr>
<td></td>
<td>unclear if patient continuing to have myelitis episodes here and if so what interventions required</td>
</tr>
<tr>
<td></td>
<td>was not to get AM bloodwork, was not communicated during sign-out, asked clarification during sign-out</td>
</tr>
<tr>
<td></td>
<td>Management of fever overnight</td>
</tr>
<tr>
<td></td>
<td>unclear under what circumstances fellow wanted labs drawn early</td>
</tr>
<tr>
<td></td>
<td>issue with hypothermia the night before: why? What to do if happens again</td>
</tr>
<tr>
<td>In interactions with nurses</td>
<td>fluids</td>
</tr>
<tr>
<td></td>
<td>whether to switch back from PO pain meds to IV</td>
</tr>
<tr>
<td>During patient care delivery</td>
<td>Management of fever overnight</td>
</tr>
<tr>
<td></td>
<td>why patient on q4h albuterol and if she had seen an improvement in sx with this, because having increased coughing</td>
</tr>
<tr>
<td></td>
<td>Patient's home medicine dose as initially ordered during admission was incorrect. Patient's mother requested a different, yet still incorrect dose. After reviewing patient's MAR and chart in EPIC, correct dose was found and ordered.</td>
</tr>
<tr>
<td></td>
<td>Wanted O2 for &quot;comfort,&quot; wasn't sure if that was okay per Hemo req</td>
</tr>
<tr>
<td></td>
<td>pt (?) rewatched to me as needing to prep overnight otherwise call surgery overnight for removal of infusion. Senior had different conversation, so resolved by calling attending</td>
</tr>
<tr>
<td></td>
<td>Previous O2 requirement, fever curve, vital signs</td>
</tr>
<tr>
<td></td>
<td>severity of stridor, how to manage</td>
</tr>
<tr>
<td>In interactions with nurses</td>
<td>fluids</td>
</tr>
<tr>
<td></td>
<td>whether to switch back from PO pain meds to IV</td>
</tr>
<tr>
<td>In interactions with parents</td>
<td>No comment provided</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Midnight rounds</td>
<td>Hospital course</td>
</tr>
<tr>
<td>Conversation with the SR</td>
<td>plan for GCSF: should we give even if ANC increased. Hadnt realized to ask that question - dont think that the intern signing out to me had either</td>
</tr>
<tr>
<td>In thinking about the patient</td>
<td>what she was at with feeding plan</td>
</tr>
</tbody>
</table>
When interns identified uncertainty about handover information, they sought input from multiple resources to resolve that uncertainty. Online point-of-care resources (institutional online pathways, hand-held reference aids or secondary-source online tools) were sought in only one case. Interns used online primary literature resources for 3 of the 31 cases where they felt uncertain; for 2 of those 3 cases, this was the only resource sought. For 28 of the 31 cases (90%), interns sought input from human resources, with supervisory residents as the primary resource in 53% of cases, nurses as the resource for 25% of the cases, and consultants (pharmacists and other consultants), attending physicians, fellows and others (interns, other residents, attending physicians not associated with the team) each as resources in 7% of cases. See Table VIII. Interns and their supervisory residents reported similar intern behaviors with regard to uncertainty resolution.
TABLE VIII
REPORTED INTERN ACTIONS Aimed At Resolving Uncertainty

<table>
<thead>
<tr>
<th>Online Resources Sought</th>
<th>N</th>
<th>%</th>
<th>Human Resources Sought</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point-of-Care</td>
<td>1*</td>
<td>3%</td>
<td>Supervisory Resident</td>
<td>15</td>
<td>48%</td>
</tr>
<tr>
<td>Primary Literature</td>
<td>3**</td>
<td>10%</td>
<td>Nurses</td>
<td>7</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other consultant (pharmacist, consult)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Attending physician for patient</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fellow</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other resident/intern/attending</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>TOTAL Unique cases where online resources were sought</td>
<td>4</td>
<td>13%</td>
<td>TOTAL Unique*** cases where human resources were sought</td>
<td>28</td>
<td>90%</td>
</tr>
</tbody>
</table>

*Supervisory resident was also sought
**For two of these cases, no human resources were sought
*** Residents could select more than one type of human resource
Role of cross-coverage in supervisory resident reporting

Cross-covering supervisory residents comprised 52 out of 82 total (63%) cases; primary team supervisory residents represented 30 of 82 (39%). Eight of the 11 (73%) cases in which supervisory residents reported missing content involved cross-covering residents; 3 of the 11 (27%) involved primary team supervisors. There was no difference in the rate of reporting missing content between cross-covering and primary team residents (Fisher’s exact test p = 0.53).

Ten of 14 (71%) supervisors reporting intern uncertainty were cross-covering; 4 of the 14 (29%) supervisors reporting intern uncertainty were primary team supervisory residents. There was no difference in the rate of uncertainty reporting between cross-covering and primary-team supervisory residents (Fisher’s exact test p = 0.56).

Of the 15 cases where interns who were missing content sought supervisory-resident support, 8 of those supervisors were cross-covering and 7 were primary-team supervisory residents. There was no difference in the rate of resource-seeking of primary-team supervisory residents vs. cross-covering supervisory residents (Fisher’s exact test p = 0.38).
DISCUSSION

The results of this and other studies indicate that handovers between interns often inadequately prepare the handover recipient to anticipate and effectively manage patient care. There has been a call to standardize handover training and sign-out processes with several authors suggesting the types of training and communication that should take place.\textsuperscript{13,29,46,47} Some studies have offered mnemonics or check lists to assist in achieving completeness of information transfer during the handover process.\textsuperscript{23,48} In this study, the electronic sign-out document provided prompts for all of the categories suggested by these proposed mnemonics. Nevertheless, interns reported missing content despite having received handover information structured within the prompting of the sign-out document. Importantly, those providing supervision were often unaware that interns were missing handover content, with interns 3.2 times more likely than their supervisors to report handover omissions. Direct supervision during the handover itself is needed to ensure that comprehensive content is transferred and certainty is achieved. Without this oversight during the handover process, care providers have no chance to solidify their shared mental model of the team’s patients, thus impeding their ability to respond as individuals to downstream clinical events.

The presence of comprehensive content alone is necessary, but not sufficient, for the intern to have a working mental model of the patients in his or her care. Contextual features of handover content provide the situation-specific meaning that allows for both prudence and prescience in clinical decision-making. For an intern to have \textit{certainty} about handover content requires that he or she be able to apply, synthesize and integrate that content within the context of both their developing clinical knowledge and the unique circumstances of a given patient. The intern’s ability to anticipate, plan for, and make decisions about a patient’s care requires a level of
phronesis that only comes with experience. In this study, even when interns did have an awareness of their own uncertainty regarding handover information, their supervisors often did not recognize this uncertainty. Here too, then, is a role for direct supervision during the handover process. Supervisory residents can enrich the mental model that interns acquire during handovers, but only if they are present during sign-out to encourage and answer the clarifying questions used to refine that mental model. Multiple factors influence intern recognition and management of uncertainty. Interns often reported recognizing their own uncertainty during the handover process itself, making the act of sign-out a metacognitive process. Having supervisors provide additional information, contextual relevance, or other explanations during handovers could reinforce this reflection-in-action and lead to improved storage of new knowledge for interns if done in a manner that encourages safe inquiry. In addition to enhancing intern metacognition, oversight during sign-out might increase supervisor awareness of interns’ uncertainty about handover content. Once aware of this uncertainty, supervisory residents may be more available as resources to their interns, thereby discouraging the hierarchy of assistance-seeking to which new physician-trainees often subscribe. Cultural pressures for trainee self-sufficiency and expectations of “graduated autonomy” push interns to seek a sense of certainty in their desire to achieve independence and join the community of practitioners. Lest this pursuit of certainty be at the expense of safe and effective handovers of care, supervisory residents and interns should be encouraged to address uncertainty openly with one another during the sign-out process.

Finally, in this study when nurses recognized missing content, 70% of the time their case-matched supervisory residents and interns did not. Including nurses in handovers or transfer-of-care rounds might help to mitigate this problem by allowing for interdisciplinary sharing of the team’s mental model of its patients and by enhancing the team’s closed loop communications.
**Limitations**

This observational study was performed prospectively with surveys completed during overnight shifts or post-call as the principal means of data collection. Reporter recall and situational awareness may have influenced the degree to which data could be reliably captured. Additionally, the study was performed on a single ward at a single institution, potentially limiting the generalizability of our findings. Though multiple resident teams rotated through the study unit during the 12 weeks of data accrual, the numbers of receiving interns and supervisory residents studied were small. The study may also have been limited by imperfect training of nurse-participants, as individual training for all nurses was not possible.

This study set out to assess the behaviors of interns around handovers *after* these interns had participated in a curriculum designed to reduce missing content and uncertainty associated with sign-out. This study also began *following* the development of an institution-wide training around a new EHR-based handover tool. Therefore, the generalizability of this study’s results to other institutions may be limited if their educational and clinical environments do not offer a similar handover curriculum and EHR-based tool.
**Recommendations for future education and clinical operations**

For optimal handovers to occur in all academic centers, supervisory residents and nurses must provide oversight and input during the handover process. Such oversight would not only ensure comprehensive data transfer during sign-out, but would encourage active group learning and deliberative inquiry about each patient, their disease process, and the reasoning behind their care plan. Interdisciplinary supervision at the beginning of each shift would facilitate verification of the team’s shared mental model of their patients, and would allow individuals to be confident in their ability to act on their own to achieve the team’s goals as the clinical environment evolves.

The culture of all learning institutions must not only encourage the sort of group inquiry noted above, but should also foster early and frequent seeking of assistance, advice, and guidance from supervisors throughout a given shift. This will help interns solidify and refine their mental model of the patients in their care, thus allowing them to provide the safest patient care.

This study’s outcomes will be used to further inform a curriculum for handover training that emphasizes both resolution of missing content and open, interdisciplinary discussion of uncertainty during the handover process. While published works regarding resident handover-training are abundant, none of this literature addresses the integration of uncertainty-management and the achievement of a team’s shared mental model if its patients. Faculty oversight and reinforcement of sound handover practices have also recently been cited as helpful adjuncts to the improvement of intern sign-out behaviors. To consistently achieve a maximal level of patient safety, training institutions must continually monitor their own handover processes, curricula and outcomes, and must frequently introduce modifications in instruction and clinical operations as the educational and clinical context evolves.
CITED LITERATURE


43. Shea JA. Mind the gap: some reasons why medical education research is different from health services research. *Medical Education.* 2001;35(4):319-320.
46. Philibert I Fau - Leach DC, Leach DC. Re-framing continuity of care for this century. 20051205 DCOM- 20060310 (1475-3901 (Electronic)).
# Intern Handover Assessment Survey

<table>
<thead>
<tr>
<th>Patient Information</th>
<th>Missing Content</th>
<th>Type of Content (for each checked content area, elaborate in next column)</th>
<th>Implications/Consequences - realized or potential (use reverse side if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Name</td>
<td>(circle)</td>
<td>Lab reports</td>
<td></td>
</tr>
<tr>
<td>Rm #</td>
<td>Y</td>
<td>Hx / hospital course</td>
<td></td>
</tr>
<tr>
<td>MR#</td>
<td>N</td>
<td>PE / vital signs or other clinical status</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>imaging reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication/consult</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Were you uncertain about any of the handover content? Or, did you want or need additional information or understanding regarding handover content?**

(circle) Y N  
If yes, when did you realize this or when did the need for additional understanding on content occur? **Check all that apply**

- [ ] During signout
- [ ] Prompted by parent communication
- [ ] Prompted by patient care need
- [ ] Prompted by consultant
- [ ] Prompted by nurse communication
- [ ] Other

**Describe area(s) of uncertainty:**

- [ ] I went to look up a resource  
- [ ] On non-primary source (e.g., CHOP website, pathway, formulary, Google, Google Scholar, Up-to-Date)  
- [ ] On Penn library or Pubmed or other journal literature database  
- [ ] And I initiated that contact  
- [ ] The senior contacted me  
- [ ] The attending contacted me  
- [ ] The attending contacted me (as scheduled +/-)  
- [ ] I initiated that contact

**What actions did you take to resolve your uncertainty?**

- [ ] I asked my senior  
- [ ] I asked another person  
- [ ] I asked the attending  
- [ ] I initiated the contact

**List handover-assigned tasks that were not completed or were incompletely done specify in space below**

- Lab draw / results check - lab, x-ray, consult note, documentation task  
- Patient status check (examination, hx update)  
- Other (specify)

**NONE** (all tasks were completed)  
**Communication task**

**Additional comments for handover improvements or suggestions for system improvements:**

---

You do not have to participate in completing this survey. If you choose to complete this survey, completion will serve as consent. Please do not put your name on this survey.
Appendix B
Supervisory Resident Handover Assessment Survey

<table>
<thead>
<tr>
<th>Patient Information</th>
<th>Did you discover that your intern had missing handover content? (check all that apply)</th>
<th>Type of Content (for each checked content area, elaborate in next column)</th>
<th>Implications/Consequences - realized or potential (use reverse side if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Name</td>
<td>(circle) Y or N</td>
<td>Lab reports</td>
<td></td>
</tr>
<tr>
<td>enrollment</td>
<td></td>
<td>EKG / vital signs or other clinical status</td>
<td></td>
</tr>
<tr>
<td>MB#</td>
<td></td>
<td>A nurse contacted me</td>
<td></td>
</tr>
<tr>
<td>MB#</td>
<td></td>
<td>The intern called me</td>
<td></td>
</tr>
<tr>
<td>MB#</td>
<td></td>
<td>If I was checking on something</td>
<td></td>
</tr>
<tr>
<td>MB#</td>
<td></td>
<td>If I was prompted (specifically)</td>
<td></td>
</tr>
<tr>
<td>MB#</td>
<td></td>
<td>Other (specifically)</td>
<td></td>
</tr>
</tbody>
</table>

Did you determine that the intern was uncertain about any of the handover content? Or, did the intern want or need additional information or understanding regarding handover content?

(circle) Y or N
- If yes, when did you realize the intern's need for additional understanding or content occur?
  - Prompted by patient care need
  - Prompted by consultant
  - Prompted by nurse communication
  - Other

Describe area(s) of intern's uncertainty:

What actions did the intern take to resolve their uncertainty?
- Seemed to look up something or primary source evidence (e.g., CHOP website, Google, GoogleScholar, Up-to-date)
- Used University or PubMed or other journal literature database
- Had a conversation with a nurse
- Asked another person

List handover-assigned tasks that were not completed or were incompletely done - specify in space below your understanding of why these tasks were not completed:
- Lab test
- Documentation task
- Patient states/changes (examination, progress update)
- Other (specify)

Additional comments for handover improvements or suggestions for system improvements:

You do not have to participate in completing this survey. If you choose to complete this survey, completion will serve as consent. Please do not put your name on this survey.
### Nursing Handover Assessment Survey

#### Workload experienced during the shift 7p-7a:

- Perception of acuity level for entire floor: [ ] Extremely High [ ] High [ ] Average [ ] Lower than average
- Fill in the blanks: __________________________  # CAT calls: __________  Total # of admissions for unit: __________

#### Desired, but missing content:

- Upon reflecting on the night's events, was there any missing content (patient information, task item/to do item) on the printed sign-out, that would have been useful for the intern to have?
  - [ ] Yes or No  //  If Yes, please check all of the desired content areas below, specifying "Other"
  - Communicate with family about...
  - Assess or re-assess (specify)
  - [ ] Other (please specify)
  - [ ] Pertinent piece of history
  - [ ] Pertinent radiographic finding
  - [ ] Pertinent laboratory value
  - [ ] Pertinent consultation report

#### Check all tasks (studies, communications, procedures, and such) that were anticipated by the nurse/parent but were not completed:

- If all anticipated tasks were completed, check here [ ]
  - [ ] Study itself (specify: lab draw, radiology, EKG, other)
  - [ ] Communication (specify: instructions, explanation, update)
  - [ ] Report of study (specify study)
  - [ ] Procedure (specify)
  - [ ] Other (specify)

#### For the above checked items, indicate your understanding of why the task was not completed:

by checking all of the relevant text below:

#### The plan changed, because:

- [ ] It changed, but I don't know why
- [ ] That task was not urgent and thus deferred
- [ ] A consult changed the plan
- [ ] The patient's clinical status changed (specify)
- [ ] The attending changed the plan
- [ ] The resident changed the plan (not one of the FLOC reasons below)
- [ ] The plan was changed by the family (specify)
- [ ] Other (specify)

#### The plan remains but did not happen, because:

- [ ] Limited or phlebotomy/IV team
- [ ] Cannot get the task scheduled
- [ ] Other (specify)

#### A systems issue:

#### Human issue:

- [ ] Forgot
- [ ] Intern too busy
- [ ] Unable (knowledge/skill/attitude/experience)
- [ ] Other (specify)

Other input:

You do not have to participate in completing this survey. If you choose to complete this survey, completion will serve as consent.

Please do not put your name on this survey.
Appendix D: Training Case for Handover Assessment

Table of Contents

1. Example Case Admission History and Physical Examination Documentation
2. Example Case Sign-out Document
3. Example Case Night Events
4. Example Case PL-1 Survey Completed
5. Example Case Supervisory Resident Survey Completed
6. Example Case Nursing Survey Completed
# Admission Note

**Chief Complaint:** Not feeling as usual

**HPI:**
- Pierre Robin Syndrome, HP mandibular distraction osteogenesis in November 2011 who came in w/ feeding difficulties & po feeds & w/ wax dehydrations.
- Contact 2 3 yr old & URI.
- Saw PMD dx & ure and mom told to cut frequency of feeds due to fluid volume and if no improvement return to ED.
- In ED today poor po intake, even S/P nasal S X Ray: dehydrated; PT to 102.7 rectally.
- CXR showed Rule Procedure, no abnormalities.
- WBC

**Past Medical/Surgical/Birth History:**
- Pierre Robin Syndrome
- HP mandibular distraction osteogenesis

**Immunizations:**
- Up to date

**Primary Care Clinician(s):**
- Dr. Paula Black
- CHOP Network

**Feeds/Diet:**
- Normally 36 g 3-4 oz sim & Fe

**Developmental History:**
- Age appropriate
- Appropriate for age, gross motor delay & just
- NN sitting & support

**Menstrual History:**
- Not applicable
- Unable to obtain (indicate reason)

**Cycle Length/Interval:**
- Birth Control Method:

**Menorrhagia?**
- Meds Used:
- Good relief?
### The Children's Hospital of Philadelphia

#### ADMISSION NOTE

**LAST NAME**

**FIRST NAME**

**MR#**

**DOB**

**PLACE PATIENT LABEL HERE OR COMPLETE ABOVE**

**DO NOT HANDWRITE PATIENT INFORMATION HERE**

<table>
<thead>
<tr>
<th>1) HISTORY (continued)</th>
<th>Date: 12/1/2011</th>
<th>Time: <strong>Noon</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Health History:</td>
<td>☑ have personally reviewed the family medical history in the EHR and updated as indicated</td>
<td>☑ I have personally reviewed the family medical history in the EHR and updated as indicated</td>
</tr>
</tbody>
</table>

---

**No other congenital anomalies**

**Social History:**

☑ have personally reviewed the social documentation section in the EHR and updated as indicated

☐ Unable to obtain (indicate reason)

- Parents divorced, but dad still involved
- 23 yo (has joint custody of 3 yo)

---

**Review of Systems**

<table>
<thead>
<tr>
<th>System</th>
<th>nL</th>
<th>abnl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constitutional</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Eyes</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Ears/Nose/Mouth/Throat</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Neurologic</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Psychiatric/Development</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Endocrinologic</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Hematologic</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>Immunologic</td>
<td>☑️</td>
<td></td>
</tr>
<tr>
<td>All Other Systems</td>
<td>☑️</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**

- **Constitutional:** micrognathia; cleft palate
- **Ears/Nose/Mouth/Throat:** relatively large tongue
- **Skin:** small nace
- **Musculoskeletal:** delayed gross motor

---

These activities must be performed in the EHR. Please use a paper medication reconciliation form during downtime.

**Allergies**

☑ have reviewed drug, food, latex, contact, rad contrast, and blood product allergies and adverse reactions and documented them in the EHR.

☑ have reviewed the need for pre-medications and documented them in the EHR.

☑ have reviewed the history for relevant chronic medical problems including CPTP, Prionogent GT, Malignant Hyperthermia, and Ketogenic Diet and documented them in the EHR if present.

**Medication Reconciliation**

☑ have reviewed and updated the "Prior To Admission" medications in the EHR.

☑ performed order reconciliation in the EHR.
**ADMISSION NOTE**

**2) PHYSICAL EXAMINATION:**

<table>
<thead>
<tr>
<th>Date: 12/11/2022</th>
<th>Time:</th>
</tr>
</thead>
</table>

|---------|--------|--------|----------|---------------------------|

<table>
<thead>
<tr>
<th>Wt: 7.3 kg (25th)</th>
<th>Ht: 62 cm (10th)</th>
<th>HC: 42.5 cm (25th)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pulse ox: 90% FIO₂ RA</th>
<th>Pain: 😇</th>
</tr>
</thead>
</table>

**General Appearance:** Micrognathia, large tongue, cleft palate

**Head, Eyes, Ears, Nose, Mouth, Throat:**
- Neck: short, right deviation
- Teeth: normal
- Tongue: large, covered
- Nasal: no deviation
- Eyes: normal
- No discoloration
- No edema

**Respiratory:**
- RESPIRATORY: Normal, constant rhinorrhea
- Cough: Normal
- ORAL: No ulcers, no oral thrush
- Nasal: No deviation
- Oropharynx: Normal
- Larynx: Normal

**Cardiovascular:**
- No murmurs, gallops, or rubs
- HR, T, and blood pressure normal

**Abdominal:**
- Soft, no HSM, no masses, no tenderness

**Genitourinary:**
- Normal
- No dysuria, no hematuria
- Testes: Normal, no masses
- Circumcised

**Musculoskeletal:**
- No tenderness, swelling, or pain

**Skin:**
- Irritation at hardware/skin interface
- Nail changes: red nails

**Neuro:**
- Motor: Normal
- Sensory: Normal
- Reflexes: Normal
- No motor or sensory deficits

**Other:**
- Small
## ADMISSION NOTE

### 3) MEDICAL DECISION MAKING

**Labs:**
- 138, 112, 121
- 2.1, 16, 0.3

**Imaging:**
- **XR:** @ UL + @ UR, milky v. osteopenia
- **CL:** @ sided pneumonia, perhaps aspiration

**Previous Medical Records:**

**Procedure(s) Done:**

**Assessment/Plan:**
1. **Pierre Robin Syndrome:**
   - worsening difficulty of feeds 2° to LTFE - possible aspiration
   - H2O2 + IVF fluid, NPO

2. **Dehydration:**
   - 2° to poor PO intake and ↑ losses

3. **Skin ulcer:**
   - hardware skin infection on mandible

4. **Hyponatremia:**
   - 2° to ↑↑↑↓ ↓↓↓ O2 support

---

**Attending/Teaching Physician**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Patient seen and evaluated by me. I reviewed, discussed and agree with the documentation to the left except as noted.**

**I discussed with:**

---

**Critical Care Time:**

- Total time:
- Total time spent counseling:
Pediatric Notes: A 6-month-old male with Pierre Robin Sequence, s/p mandibular distraction osteogenesis 2 weeks ago, who has LRTI, hypoxia, fever, poor fluid intake and dehydration.

Last Weight: 7.3 kg (12/1/2011)
Dosing Weight: --

Attending: Elizabeth Jackson, MD
Service: General Pediatrics
Front Line Clinician: Really Good Intern
PCPs:
Paule Gabbard, MD PCP Type: General Pediatrics

Allergies: Review of patient's allergies indicates no active allergies.

Scheduled Meds:
Amoxicillin 335 mg IV q 8 hr; 275 mg IV q 4 hr
Continuous Meds:
PRN Meds:
Tylenol 160 mg po q 4 hr pm fever > 101.3 rectally

Oxygen Therapy: 02 per nasal cannula to keep oxygen sat > 96%

Problem List Summary:
1. Pierre Robin Sequence
   - Hypoxia
   - Micrognathia – s/p distraction osteogenesis procedure 11/15/2011
   - Large tongue, posteriorly displaced

2. Feeding difficulties
   - Usually feeds with special breast, nipple for cleft
   - 3 oz, 2-3 hr during daytime and one in the middle of the night
   - Unable to po successfully now

3. Pneumonia – RI upper and middle lobe consolidation on CXR 12/1/2011 – new
   - Increased WBC, RRI = 48
   - Fever
   - ? Aspiration risk?
   - On Amoxicillin and Cefotaxime

4. Hypoxia
   - Likely due to PNA
   - Support with NC O2 to keep pulse ox > 96% sat
   - Nasal suctioning as needed

5. Dehydration
   - IV for support
   - No po until RR < 40 bpm

Additional Details:
Nutrition/TPN: D5 1/2 NS +30 meq KCVL at maintenance
Access/IV/PJ/Drains:
Baseline/Current Exam: Significant WBC, made somewhat better with nasal suctioning; Oxygen sat’s lower than tolerated on RA – new, not able to po as usually can at home.

Pertinent Labs/Imaging: Slightly elevated Na, likely due to slight dehydration

Psychosocial Hx: Parents divorced; mom stressed

Disposition:

To Do:
[ ] Respiratory exam check every 4-6 hrs
[ ] If respiratory rate < 40 then can trial po feeds; if po feeds, decrease IV by accordingly
[ ] Check repeat Na at 6 pm
[ ] UPDATE PNA 215.590.7008 @ 8 pm; Attending @ 10 pm 215.590.0000
[ ] Notify CAT immediately if worsening of breathing or change in sat's
[ ] Check ENT consult note when completed and notify Attending if any changes in plan recommended
Night Events for Lonnie Boy Smith

This patient was admitted during the afternoon and final orders and sign-out in EPIC was complete by 4pm. At 5-6pm that night the day intern signed this patient out to the night intern. The senior for the team was the senior on call that night.

During the night, the following things happened:

- Intern to intern sign-out
  - Intern sender has never seen a patient with Pierre Robin Sequence. The sender had looked up information on Google shortly after the admission and hands that information to the receiver intern. The sender has no information available regarding the hardware or the process of distraction osteogenesis for this condition. This is a point of uncertainty for both the sender and the receiver.
  - The information about the CXR is discussed, including consideration for possible aspiration pneumonia. The feeds are held, not due to aspiration risk per se, but due to possible aspiration risk and/or feeding intolerance with respiratory rate >40 breaths/min. This is an ongoing piece of uncertainty that is not even recognized by either the sender nor the receiver.
  - The sender does know that ENT and craniofacial were called in the ED, but does not have any documentation and thus is unaware that there were suggestions made to the family about possible CT imaging.

- Dad arrives after work (approximately 7pm)
  - Dad had been in the ED most of the night (prior to admission) and then went off to work at 10am. He is concerned that the discussion he and Lonnie Boy’s mother had with the ENT/craniofacial team is different than the current plan.
  - Dad requests to discuss the disconnect/communication gap with a doctor.
    - The receiver intern arrives, at nurse’s request and learns of Dad’s question.

- The receiver intern calls ENT.
  - The ENT resident that is on call is not the one that did the consult in the ED

- The receiver intern calls the Craniofacial service
  - The craniofacial nurse practitioner who is familiar with family calls back and confirms that if the site looks infected that antibiotics are indicated. She will report to her attending that the pediatric team is asking about the request/need for CT imaging.
• The infant is on 2 L NC O₂
  o Later that night, the nurse calls the intern to see the patient, who is having trouble with increased secretions from nose and cleft-palate with decreasing oxygen saturations. RT is called and suctions the patient, with some improvement in oxygenation. Mom offers that if the infant could feed this may console him— that he is having these increased secretions because he is crying so much. The intern looks at the sign-out and sees that the feeding is prohibited with RR>40 and communicates this to mom. Mom offers that the infant often breathes faster than 40, and can feed.
  o The intern returns to ask the senior if feeding the baby is a problem, based on what Mom says about the history at home.
  o The senior discusses with the intern the risk of aspiration with increased work of breathing during bottle feeds, especially with a cleft-lip and palate - something the intern did not know about (was unaware of this uncertainty).
  o Senior also suggests the possible upcoming NPO status due to possible CT imaging request

• Overall, the night was not too busy. There were 4 admissions, no CAT calls and things were overall calmer than usual.
**Intern Handover Assessment Survey**

### Patient Information
- Patient Name: [Name]
- Rm #: [Room Number]
- MR#: [Medical Record Number]

### Did you care for this patient before? (circle) Y or N

### Type of Content (for each checked content area, elaborate in next column)
- Lab reports
- hx/hospital course
- PE/vital signs or other clinical status
- Imaging reports
- Communication/consult
- Other

### Implications/Consequences - realized or potential (use reverse side if needed)
- No idea what ENT/otolaryngol has told mom. She is concerned about delay in care.

### Were you uncertain about any of the handover content? Or, did you want or need additional information or understanding regarding handover content? (circle) Y or N

### If yes, when did you realize this or when did the need for additional understanding on content occur? Check all that apply
- [ ] during signout
- [ ] prompted by other communication
- [ ] prompted by patient care need
- [ ] prompted by consultant
- [ ] prompted by nurse communication
- [ ] other

### Describe area(s) of uncertainty:
- None. 

### What actions did you take to resolve your uncertainty?
- [x] I went to look up a resource
- [ ] on non-primary source (e.g., CHOP website/pathway/formulary, google, google scholar, up-to-date)
- [ ] on Upenn library or Pubmed or other journal literature database
- [ ] I called my senior
- [x] and I initiated that contact
- [ ] the senior contacted me
- [ ] I asked another person
- [ ] nurse
- [x] consultant
- [x] attending
- [ ] fellow
- [ ] other resident/intern/attending
- [ ] I asked the attending
- [x] the attending contacted me (as scheduled +/-)
- [ ] I initiated that contact

### List handover-assigned tasks that were not completed or were incompletely done - specify in space below** your understanding of why these tasks were not completed.
- [x] NONE (all tasks completed)
- [ ] lab draw / results check / lab, x-ray, consult note
- [ ] documentation task
- [ ] patient status check (examination, hx update)
- [ ] other (specify)

### Additional comments for handover improvements or suggestions for system improvements:
- I did not know that the Dad was coming in and expected a report on this patient. The nurse told me only after the Dad arrived - I had no update to give him since ENT/otolaryngol had not been by yet to see the patient on the floor. And, if there is a plan to get a CT that was suggested in the ED or on the phone with a consultant, we should know that plan since it may require several steps in preparation, such as NPO status, sedation/anesthesia consult, etc.

---

You do not have to participate in completing this survey. If you choose to complete this survey, completion will serve as consent. Please do not put your name on this survey.
**Supervisory Resident Handover Assessment Survey**

<table>
<thead>
<tr>
<th>Patient Information</th>
<th>Did you discover that your intern had missed handover content? (Check all that apply)</th>
<th>Type of Content (for each checked content area, elaborate in next column)</th>
<th>Implications/Consequences - realized or potential (use reverse side if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Name</td>
<td>(circle) Y or N</td>
<td>Lab reports</td>
<td></td>
</tr>
<tr>
<td>Rm #</td>
<td></td>
<td>HR / hospital course</td>
<td></td>
</tr>
<tr>
<td>MRIF</td>
<td></td>
<td>PE / vital signs or other clinical status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) A nurse contacted me</td>
<td>Imaging reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication / consult check</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) The intern called me</td>
<td>Current status (condition)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) I was prompted (specify)</td>
<td>Other (specify)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you determine that the intern was uncertain about any of the handover content? Or, did the intern want or need additional information or understanding regarding handover content?</td>
<td>(circle) Y or N</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe area(s) of intern's uncertainty: This intern had never seen a case of Pierre Robin and had not heard of distraction osteogenesis. Also, the intern did not know about the risk of inspiration w/ RR &gt; 40 in such patients.</td>
<td>(circle) Y or N</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What actions did the intern take to resolve their uncertainty?</td>
<td>(x) They went to look up a resource</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) They had a conversation with you</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) They asked another person</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>List handover-assigned tasks that were not completed or were incompletely done - specify in space below**: your understanding of why these tasks were not completed:</td>
<td>(x) Lab draw</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) Patient status check (examination, hx update)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) Documentation task</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) Communication task</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(x) NONE (all tasks were completed)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional comments for handover improvements or suggestions for system improvements:** We need a better way to get sign-out from ENT/surgery to when they consult in the ED. We were not sure if they were going to write a note, if they were going to come by and when we paged the resident on-call for ENT they did not even know this patient since they just came on call and were not in the ED.
Nursing Handover Assessment Survey

Workload Experienced during the shift 7p-7a:

<table>
<thead>
<tr>
<th>Perception of acuity level for entire floor:</th>
<th>Extremely high</th>
<th>High</th>
<th>Average</th>
<th>Lower than average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fill in the blanks:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># CAT calls</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of admissions for unit</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Detected, but missing content:

- Communication with family about...
- Assess or reassess (specify)
- Other (please specify)

Upon reflecting on the night's events, was there any missing content (patient information, task item/to-do item) on the Sign-out, that would have been useful for the FLOC?

- Yes [x] No [ ]

If Yes, please check all of the desired content areas below, specifying "Other".

- Pertinent piece of history [ ]
- Pertinent radiographic finding [ ]
- Pertinent laboratory value [ ]
- Pertinent consultation report [ ]

Check all tasks (studies, communications, procedures, and such) that were anticipated by the nurse/parent but were not completed. If all anticipated tasks were completed, check here [ ]

- Communication (specify: instructions, explanation, update) Dad expected update on Lesnie from ENT and from primary team [x]
- Procedure (specify) [ ]

For the above checked items, indicate your understanding of why the task was not completed by checking all of the relevant text below:

- The plan changed because:
  - [x] It changed, but I don't know why. No one on the pediatric medical team knew of parent discussions with ENT
  - [ ] Task was not urgent and thus deferred
  - [ ] A consult changed the plan
  - [ ] The patient's clinical status changed (specify)
  - [ ] The attending changed the plan
  - [ ] The resident changed the plan (not one of the FLOC reasons below)
  - [ ] The plan was changed by the family (specify)
  - [ ] Other (specify)

- The plan remains but did not happen, because:
  - [ ] Limitation of phlebotomy/lv team
  - [ ] Cannot get the task scheduled
  - [ ] Other (specify)

Anticipated tasks that were not completed:

- [ ] Procedure (specify)

- Other (specify): Mum was told by ENT that there was concern for skin and possibly bone infection if fever were to arise; she asked if antibiotics choices had been discussed with ENT or craniofacial team.

Other input: There was concern on the parent's part that ENT and craniofacial had talked them that any fever associated with redness or drainage at the site of the hardware for distraction osteogenesis could be due to infection at the site of the hardware skin interface. Should this child be NPO for a potential CT scan to look for deeper infection? Should sedation/anesthesia come for potential CT?
Appendix E: Coordinator activities

**Mondays, Wednesdays and Thursdays:**

**3-4pm:** Work with senior who is NOT on call that night from the team or the charge nurse to determine which gen ped patients are not going to be discharged that night.

**4-5pm:** Fill out coordinator grid, employing the following steps: 1) Use random number generator to assign intern and senior resident numbers – keep log of those numbers in case residents or interns rotate again on SE. 2) Copy pre-assigned Case Number on each survey in packet (supervisory resident, intern and nurse).

Print label with case number for each case – these labels will be placed on the printed sign-out sheet by the intern as soon as the sign-out is completed. (Interns will be instructed to eliminate the patient name and MR # on each sign-out sheet as soon as the Case Number sticker is applied to the sign-out document.)

Determine three eligible patients for the study based on the following system (not to be revealed to the residents): On Monday, choose the first three general pediatrics patients whose last names begin with A-L; on Wednesday, choose the first three eligible general pediatrics patients whose last names begin with M-Z; on Thursday, choose the last three eligible general pediatrics patients whose last names begin with A-L.

Put the patient name and MR number in the corner of each survey form, making sure that each packet or set of survey forms has the same Case Number. Paperclip the label with the Case Number and the three survey forms together.

**5-6pm:** Go to 5East Resident Work Room and place three packets in the envelope on the wall.

AS SOON AS SIGN-OUT IS COMPLETED: Call SE intern and ask if they have distributed the surveys to their senior, the bedside nurse taking care of the patient (after the shift has started) and if they remembered to print the sign-out at the end of sign-out!!!
<table>
<thead>
<tr>
<th></th>
<th>Case # - randomly generated</th>
<th>Intern Unique ID# (look up on roster)</th>
<th>Supervisory Res Unique ID# (look up on roster)</th>
<th>Nurse Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
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<tr>
<td>Wednesday</td>
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<td>Friday</td>
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<td>Monday</td>
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<td>Wednesday</td>
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<tr>
<td>Monday</td>
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<td>Wednesday</td>
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<tr>
<td>Monday</td>
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<tr>
<td>Wednesday</td>
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</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F

**Handover Missing Content**

89 Cases

For these 89 cases, interns reported handovers as having...

- 66 (74%) No Missing Content
  - For these cases, 60* case-matched SRs reported *inrem* handovers as having...
    - 55* (92%) No Missing Content
    - 5* (8%) Missing Content\(^d\)
  - 16* (73%) No Missing Content\(^c\)
  - 6* (27%) Missing Content\(^b\)

- 23 (26%) Missing Content\(^a\)
  - For these cases, 22* case-matched SRs reported *intern* handovers as having...

\(^a\)Nature of missing content: Appendix Table 2
\(^b\)Nature of missing content: Appendix Table 5
\(^c\)Nature of missing content: Appendix Table 6
\(^d\)Nature of missing content: Appendix Table 7

\(^*\)There were 7 fewer SR surveys completed for the 89 intern survey-completed cases; 6 fewer in the cases where interns reported no missing content and 1 fewer in the cases where interns reported missing content
Appendix G

Handover Missing Content

82 Cases

- 71 (87%) No Missing Content
- 11 (13%) Missing Content

For these 82 cases, SRs reported handovers as having...

- 55 (77%) No Missing Content
- 16 (23%) Missing Content

For these cases, interns reported...

- 6 (55%) No Missing Content
- 5 (45%) Missing Content
### Appendix H

**Uncertainty: Supervisory Resident Response by Intern Response**

<table>
<thead>
<tr>
<th>Interns (n=89)</th>
<th>Recognition of Uncertainty # (%)</th>
<th>When Uncertainty Recognized</th>
<th>Recognition of Uncertainty # (%)</th>
<th>When S.R. Recognized Intern Uncertainty</th>
<th># Times Interns and SR Shared Prompt for Recognition of Uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes 31 (35)</td>
<td>15 (48) Sign-out</td>
<td></td>
<td>4 (40) Sign-out</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 (39) Patient care</td>
<td></td>
<td>4 (40) Patient care</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 (23) Nurse</td>
<td></td>
<td>1 (10) Nurse</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 (3) Parent</td>
<td></td>
<td>1 (10) Parent</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 Consultant</td>
<td></td>
<td>0 Consultant</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 (10) Other (a,b,c)</td>
<td>(a=Midnight rounds discussion; b=conversation with SR; c=thinking about pH)</td>
<td>1 (10) Other (uncertain of interpretation of lab result)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>No 18 (62)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix I  Uncertainty: Supervisory Resident Response by Intern Response

<table>
<thead>
<tr>
<th>INTERNS (n=89)</th>
<th>SUPERVISORY RESIDENTS (4 missing; 54 intern-SR pairs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of Uncertainty</td>
<td>Recognition of Uncertainty</td>
</tr>
<tr>
<td>No</td>
<td>Yes 4 (7)</td>
</tr>
<tr>
<td>58 (65)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>50 (86)</td>
</tr>
</tbody>
</table>
### Appendix J

#### Uncertainty: Intern Resident Response by Supervisory Resident Response

<table>
<thead>
<tr>
<th>Supervisory Residents (n=82)</th>
<th>Interns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognition of Uncertainty # (%)</strong></td>
<td><strong>Recognition of Uncertainty # (%)</strong></td>
</tr>
<tr>
<td><strong>Yes 14 (17)</strong></td>
<td><strong>Yes 10 (71)</strong></td>
</tr>
<tr>
<td>6 (29)</td>
<td>5 (50)</td>
</tr>
<tr>
<td>5 (18)</td>
<td>3 (30)</td>
</tr>
<tr>
<td>1 (6)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>1 (6)</td>
<td>1 (10)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 (12)</td>
<td>2 (20)</td>
</tr>
</tbody>
</table>

| **No 4 (29)** | | | |

---

*Note: This table lists the recognition of uncertainty and the contexts in which it was recognized by supervisory and intern residents. The numbers in parentheses represent the percentage of cases where each category occurred.*
Appendix K

Uncertainty: Intern Resident Response by Supervisory Resident Response

<table>
<thead>
<tr>
<th>SUPERVISORY RESIDENTS (N=82)</th>
<th>INTERNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition of Uncertainty # (%)</td>
<td>Recognition of Uncertainty # (%)</td>
</tr>
<tr>
<td>No 68 (83)</td>
<td>Yes 18 (26)</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>No 50 (74)</td>
</tr>
</tbody>
</table>
The types of missing content and the implications for that missing content differed amongst interns and SRs.
From: eIRB_Notification@chop.edu
Sent: Tuesday, December 13, 2011 12:05 PM
To: Hicks, Patricia
Subject: IRB Submission: Exemption Granted

Date: Tue Dec 13 12:03:25 EST 2011
To: Patricia Hicks
From: Mark Schreiner, M.D., Chair, Committees for the Protection of Human Subjects
Re: IRB# IRB11-036643 , Protocol Title: Handover Assessment: Initiative in Innovation for Pediatric Education (IIPE)

IRB SUBMISSION: EXEMPTION GRANTED

Determination Date: 12/13/2011

Document(s) Reviewed:

- Assessment of Handover Content Transferred and Understanding of Transferred Content Can Inform Handover Effectiveness using Standardized Handover Template, Upload Date: 12/13/2011
- Please refer to this protocol workspace in eIRB to identify the materials reviewed by the IRB. The IRB considered all of the submitted documents when the research was approved.

Thank you for the submission of the above-named study. The IRB has determined it is exempt from IRB review per 45 CFR 46.101(b)(1) and 46.101(b)(2).

If you change your protocol in any way, please submit an amendment to the IRB.
If you have any questions, please contact the IRB Office.

Thank you for your cooperation in protecting human subjects.

--- This memorandum constitutes official CHOP IRB correspondence.

3535 Market Street, Suite 1200, Philadelphia, PA, 19104
Tel: 215-590-2830
Email: regafflum@email.chop.edu

---

This email is in HTML format to ensure access to all links contained therein. This is an automated notification email. Please do not reply.
Exemption Granted

December 19, 2011

Patricia Hicks, MD
Medical Education
2506 Delancey Street
Philadelphia, PA 19103
Phone: (215) 764-7973

RE: Research Protocol #2011-1117
"Handover Assessment"

Sponsors: None

Dear Dr. Hicks:

Your Claim of Exemption was reviewed on December 19, 2011 and it was determined that your research protocol meets the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)]. You may now begin your research.

Please note the following regarding your exempt research:

Exemption Period: December 19, 2011 – December 18, 2014
Lead Performance Site: The Children’s Hospital of Philadelphia (CHP)
Other Performance Sites: UIC
Subject Population: Adult (18+ years) subjects only
Number of Subjects: 38 (all recruited at CHP)

The specific exemption categories under 45 CFR 46.101(b) are:

(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods;

and

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects'
responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, or reputation. You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

1. **Amendments** You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. **Record Keeping** You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. **Final Report** When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

4. **Information for Human Subjects** UIC Policy requires investigators to provide information about the research protocol to subjects and to obtain their permission prior to their participating in the research. The information about the research protocol should be presented to subjects in writing or orally from a written script. When appropriate, the following information must be provided to all research subjects participating in exempt studies:
   a. The researchers affiliation; UIC, JBVMAC or other institutions,
   b. The purpose of the research,
   c. The extent of the subject’s involvement and an explanation of the procedures to be followed,
   d. Whether the information being collected will be used for any purposes other than the proposed research,
   e. A description of the procedures to protect the privacy of subjects and the confidentiality of the research information and data,
   f. Description of any reasonable foreseeable risks,
   g. Description of anticipated benefit,
   h. A statement that participation is voluntary and subjects can refuse to participate or can stop at any time,
   i. A statement that the researcher is available to answer any questions that the subject may have and which includes the name and phone number of the investigator(s).
   j. A statement that the UIC IRB/OPRS or JBVMAC Patient Advocate Office is available if there are questions about subject’s rights, which includes the appropriate phone numbers.

Please be sure to:

- Use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.
We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Charles W. Hoehne, B.S., C.I.P.
Assistant Director, IRB # 2
Office for the Protection of Research Subjects

cc: Ilene B. Harris, Medical Education, M/C 591
    Alan Schwartz, Medical Education, M/C 591
Office Address:
The Children’s Hospital of Philadelphia
34th Street and Civic Center Boulevard
Main Hospital – 9NW 72
Philadelphia, PA 19104-4399

Education:
1979 B.S. Indiana University, Bloomington, IN (Mathematics)
1984 M.D. Indiana University School of Medicine, Indianapolis, IN

Postgraduate Training:
1984-1987 Resident Department of Pediatrics, Vanderbilt University Medical Center, Nashville, TN
2007–present M.H.P.E. University of Illinois at Chicago (Masters in Health Professions Education – final thesis completion Spring 2012)

Faculty Appointments:
Vanderbilt University, Nashville, TN
1987-1991 Clinical Instructor, Vanderbilt University Medical Center, Nashville, TN

UT Southwestern Medical Center, Dallas, TX
1993-2005 Assistant Professor, Department of Pediatrics
2005-2009 Associate Professor, Department of Pediatrics

2006-2009 Faculty, Division of Ethics and Health Policy

Southern Methodist University, Dallas, TX
1996-2009 Adjunct Professor of Law, Dedman School of Law

2010-present University of Pennsylvania School of Medicine, Philadelphia, PA
Professor of Clinical Pediatrics

Hospital and Administrative Appointments:
1987-1991 Attending Physician, Vanderbilt University Hospital, Nashville, TN
1987-1991 Attending Physician, Centennial Medical Center, Nashville, TN
1987-1991 Attending Physician, Baptist Hospital, Nashville, TN
1993-2009 Attending Physician, Parkland Memorial Hospital, Dallas, TX
1993-2009 Attending Physician, Children’s Medical Center, Dallas, TX
1996-2006 Director, Resident Continuity of Care Clinic, Children’s Medical Center, Dallas, TX
2004-2009 Director, Pediatric Residency Program, Children’s Medical Center, Dallas, TX
2009-2011 Director, Pediatric Residency Program, The Children’s Hospital of Philadelphia, Philadelphia, PA
Community Employment:
1987 – 1989   Old Harding Road Pediatric Associates (Nashville, TN)
1989 – 1990   Miller Medical Group (Nashville, TN)
2000 – 2002   Director, Family Hospice Pediatric Section (Dallas, TX)

Certification:
1989 American Board of Pediatrics
1996 Recertification of American Board of Pediatrics
2002 Recertification of American Board of Pediatrics
2012 Recertification of PALS
2011 Active in ABP Maintenance of Certification

Licensure:
1993-2009   Texas (J5351)
2009-present   Pennsylvania (MD437959)

Awards, Honors and Membership in Honorary Societies:
2005 Hurricane Hero (for role as Director of Pediatric Relief Services at the Dallas Convention Center and Children’s Medical Center Dallas)
2007 Elected to Southwestern Academy of Teachers; titled Distinguished Teaching Professor

Memberships in Professional & Scientific Societies and Other Professional Activities:

National Consulting and Advisory Boards (selected):
1996-2009   Ambulatory Pediatric Association - Education Committee, member
2004-2005   Institute of Medicine of the National Academies: Committee on Post-market Surveillance of Pediatric Medical Devices, member
2005   Institute of Medicine of the National Academies: Committee on Workshop on Disability in America, member
2005-2006   Institute of Medicine of the National Academies: Committee on Disability in America, member
2005-2009   Association of Pediatric Program Directors - Working Committee with ACGME
2005-2009   Association of Pediatric Program Directors, Technology Task Force, member
2007-2010   Association of Pediatric Program Directors, Board member
2008-present   American Board of Pediatrics, Program Directors Committee
2009 –present   Milestones Project – Workgroup Committee, ACGME/ABP collaborative
2010-2012   President-elect Association of Pediatric Program Directors
2012-present   President Association of Pediatrics Program Directors
2010-present   Advisory Board for APPD Longitudinal Educational Research Network, chair
2010-present   Initiative for Innovation in Pediatric Education Review Committee, member
2011-present   Invited Expert for Medbiqitous Educational Trajectory Working Grp, member

http://www.medbiq.org/working_groups/educational_trajectory/index.html
Professional Organizations and Societies:
1987-1991  Nashville Pediatric Society
1989-present  American Academy of Pediatrics
1993-2009  Dallas Pediatric Society
1998-2009  Texas Pediatric Society
2007-2009  UT Southwestern Academy of Teachers
2007-present  American Pediatric Society
2011-present  Federation of Pediatric Organizations

Editorial Positions:
2008-2012  APPD Associate Editor for Academic Pediatrics

Review Activities (current):
Journals
Academic Pediatrics (formerly Ambulatory Pediatrics journal)
American Academy of Pediatrics – Newly Published Books
Journal of Adolescent Medicine
Pediatric Infectious Disease Journal
Journal of Graduate Medical Education

Grants and Projects
Ambulatory Pediatrics Association Special Awards Projects Reviewer
Ambulatory Pediatric Association Educational Scholars Grant Reviewer
Association for Pediatric Program Directors Special Projects Grant Reviewer

Abstracts and Posters
Pediatric Academic Society Abstract Reviewer
APPD Research Abstract, Workshop and Poster Reviewer

Academic and Institutional Committees:
UT Southwestern Medical Center
1995-1997  Institutional Review Board, member
2002-2009  Graduate Medical Education Committee, member
2004-2009  UT Southwestern Ethics Committee member
2004-2009  Grand Rounds Coordinating Committee for Department of Pediatrics, Co-Director
2003-2004  Resident as Teacher Campus-wide Work Group, Chair
2006  Search Committee for Chair of Department of Family Medicine, member
2007  Graduate Medical Education Committee – Task Force for Evaluation, Chair
2009  Liaison Committee on Medical Education: Task Force for Faculty Subcommittee, Chair

Children’s Medical Center Dallas
1995-2001  Utilization Review Committee, member
1996-2006  Continuity of Care Clinic, Director
1996-2009  Ethics Committee, member
1997-2001  Medical Information System Physician Committee, member
2002-2004  Clinical Decision Support Committee, Chair
2004-2009  Residency Education Steering Committee, Chair
2004-2009  Electronic Record Steering Committee, member
2004-2009  Physician Advisory Committee for Electronic Medical Record, member
2004-2009  Medical Records Committee, member
2004-2009  Graduate Education Committee, member
2005-2009  Residency Mentor Group, Chair
2005-2009  Quality Review Committee, member
2008-2009  Performance Initiative Throughput Committee, member
- Task Force on Discharge Delays, Chair
2008-2009  Inpatient Admissions and Throughput Steering Committee, member
2009-2009  Executive Clinical Leadership Committee, member

The Children’s Hospital of Philadelphia
2009-2010  Care Model Project, Clinical Sponsor
2010-2012  Safekeeping Core Team, member
2010-2012  Quality and Safety Leadership Cmte, member

Major Academic and Clinical Teaching Responsibilities:

Vanderbilt University Medical Center
1987-1991  Inpatient teaching attending on general pediatrics service

University of Texas Southwestern Medical Center
1993-2006  Continuity Clinic Attending (Director, 1996-2006)
2004-2009  Pediatric Residency Program, Director
1993-1998  Primary care for HIV infected children, Attending
1998-2002  Low Birth Weight Clinic, Attending
2002-2009  Inpatient general pediatrics teaching service, Attending
1998-2008  Medicine, Law and Literature (course offered at SMU and UTSW), Course Co-Director
2003-2009  Effective Teacher Series, Lecturer
1997-2009  Medical Student Clerkship, Lecturer
2005-2009  UTSW Resident as Teacher Workshop, Course Director
1996-2006  Ethics in Clinical Science Course, Lead Facilitator (changed to Colleges program in 2007)
2005-2009  Pediatric Fellows Conference, Lecturer
2007-2009  The Colleges Course for first and second year medical students, Mentor/Teacher

The Children’s Hospital of Philadelphia
2009- present  Inpatient general pediatrics teaching service – Attending
2009- present  Medical Student Pediatric Physical Examination Course, Faculty

Recent Lectures by Invitation:

Spring 2008 APPD Meeting
- APPD’s L.E.A.R.N. Pilot Project on Procedural Competency: (Sharing of strategies for instruction and assessment of pediatric procedures; results of APPD survey; pilot opportunities for procedural competency, instruction and assessment
- ShareWarehouse: A new web-based portal for sharing intellectual property for collaboration and dissemination.
Fall 2008 APPD Meeting
- **Program Evaluation:** Literature review on program evaluation with presentation of a task-oriented conceptual model of program evaluation with practical tools to conduct program evaluation and program improvement
- **A Year in the Program:** Review of month-by-month activities for a state-of-the-art pediatric residency program; the talk is aided by a 200 page book with online supplements, offering to the membership templates of curriculum, evaluation tools, administrative documents and organizational aids

Spring 2009 UT Southwestern Effective Teacher Series
- How to Assess and Develop Self-Directed Learning

Fall 2009 APPD Meeting
- **A Year in the Program:** Review of month-by-month activities for a state-of-the-art pediatric residency program; the talk is aided by a 200 page book with online
- **Program Improvement through Program Evaluation**
- **New Media, Social Networking Websites, and Disruptive Technology:** How to Consider Pros and Cons of Resident and Program Use

Spring 2010 APPD Meeting
- **Assessment in Medical Education:** What it is and what it is not. A workshop overview of key assessment concepts and application of those concepts to a practical assessment decision

Fall 2010 APPD Meeting
- **Program Improvement through Program Evaluation** How to apply an evidence-based approach to evaluation to inform program improvement

Spring 2011 APPD Meeting
- **Pilot Project for APPD LEARN**

Fall 2011 APPD Meeting
- **A Year in the Program:** Review of month-by-month activities for a state-of-the-art pediatric residency program; the talk is aided by a 200 page book with online
- **Program Improvement through Program Evaluation** Overview of the approach to evaluating residency programs for the purpose of informing program improvement
- **Surviving a Site Visit in the Competencies Era** PIF overview, logistics of the site visit and practical resources and advice

Spring 2012 APPD Meeting
- **Leading Teams, Managing People, and Making Projects Scholarly – Essential Professional Development Skills for Program Directors** (Pre-meeting Workshop)
- **Building a Roadmap for Scholarship in your Everyday Work**
- **Translating the Pediatrics Milestones into Meaningful Assessment Tools for Your Program**
Recent National Presentations:

Nancy Kelly, MD, MPH, Ami Dharia, MD, Patricia Hicks, MD  *Can Continuity Clinic Patient Data be Accurately Entered into the ACGME Case Log by a Third Party? One Program’s Experience.*  Presented at SPR, May 2007 as an abstract and poster.

Dorothy Sendelbach, MD, Patricia Hicks, MD, Reenu Eapen, MD  *Successful Development of Resident Mentorship in a Large Training Program*  Presented at APPD, May 2008 as an abstract and poster.

Nancy Kelly, MD, MPH, Ami Dharia, MD, Patricia Hicks, MD  *Assessing Resident Competence and Awareness of Developmental Screening Skills*  Presented at PAS, May 2008 as an abstract and poster.

Patricia Hicks, MD, Dorothy Sendelbach, MD, Reenu Eapen, MD, Dena Hofkosh, MD, Bonnie O’Connor, MD, Angela Mihalic, MD  *Workshop: Developing Faculty as Mentors: Design and Implementation of an Effective Mentor Program for Residents.*  Presented at PAS, May 2008.

Patricia Hicks, MD, Nancy J. Robert, PhD, Carol Carraccio, MD, Linda Lewin, MD  *Workshop: Medical Decision Making: The Role of Knowledge, Beliefs and Self-Efficacy.*  Presented at PAS, May 2009.

Patricia Hicks, MD, Ann Burke, MD, Carol Carraccio, MD, Dorothy Sendelbach, MD, Bonnie O’Connor, MD, Reenu Eapen, MD  *Workshop: Mentoring, Assessing and Advising Learners with Difficulties: Design and Implementation of a Mentorship Program for Residents with Learning and Professional Difficulties.*  Presented at PAS, May 2009.

Patricia Hicks, MD, Ann Burke, MD, Carol Carraccio, MD  *Assessment in Medical Education: What it is and is not:* An interactive workshop on the theory and application of assessment methods; Presented at APPD, April 2010.

Patricia Hicks, MD, Hilary Haftel, MD, Eric Thomas, MD  *Topic Symposium: Effective Teamwork, Communication and Patient Handovers: Mitigating Fragmentation of Patient Care*  Presented at PAS, May 2010.

Patricia Hicks, MD, Erin Giudice, MD, Aditee Narayan, MD, Janet Serwint, MD.  *Workshop: Developing your Scholarship Roadmap*  An interactive workshop with instruction in the design and innovation of scholarship with application to the attendee’s proposed project.  Presented at the APA/APPD Leadership Conference September 21-22, 2010.

Patricia Hicks, MD, Janet Serwint, MD  *Workshop: Developing your Scholarship Roadmap*  An interactive workshop with instruction in the design and innovation of scholarship with application to the attendee’s proposed project.  Presented at APPD, April 2011.

Bradley Benson, MD, Robert Englander, MD, Dan Schumacher, MD, Patricia Hicks, MD, Carol Carraccio, MD  *Pediatrics Milestones 101: An Educator’s Guide to What They Are, What They Aren’t, and What They Could Be.*  Presented at APPD, April 2011.

Patricia Hicks, MD and Milestone working group (Dan Schumacher presenting)  *Pediatrics Milestones: Initial Evidence for Use as Learner-Centered Roadmaps*  Platform Presentation, APPD, April 2011.


Patricia Hicks, MD, Ann Burke, MD, Douglas Jones, MD, Robert Engleander, MD, Carol Carraccio, MD, MS Workshop: *Entrustable Professional Activities (EPAs), Milestones and Competencies, Oh My!*...Presented at PAS, May 2011

Janet Serwint, MD, Patricia Hicks, MD Workshop: *Scholarship beyond publication: Creating scholarship that counts from the work that you do* Presented at PEEAC, September 2011

Levon Utidjian, MD, Christopher Bonafide, MD, Eric Shelov, MD, Lisa DelSignore, MD, Katie Lockwood, MD, Patricia Hicks, MD *Rapid-cycle optimization of an HER-integrated handover tool* Poster – Presented at PAS, April 2012

Patricia Hicks, MD, Carol Carraccio MD, Tara Kennedy, MD, Joe Gilhooly, MD Topic Symposium #2355 Meaningful Assessment of Pediatric Learners – From Competencies to Milestones, EPAs to Evaluation Presented at PAS, April 2012

**Recent International Presentations:**


**Organizing Roles in Scientific Meetings:**

- Organizing, planning and presenting at the APPD Fall and Spring meetings are part of the responsibilities for all APPD Board Members. Reviewing and selecting workshops, posters and other presentations is part of the responsibilities. As the APPD Associate Editor for Academic Pediatrics, educational submissions from the Annual Spring Meetings are also reviewed.

- As an APS member, educational works submitted for PAS are reviewed each year.

**Educational Research/Innovation:**

- Recipient of an Initiative for Innovation in Pediatric Education project [http://www.innovatepedsgme.org/Aprops.cfm](http://www.innovatepedsgme.org/Aprops.cfm): *Education in Team-based Collaborative Care and Transfer of Care to Improve Resident Education and Quality of Care* (PIs Patricia J. Hicks and Hilary Haftel)

- National Board of Medical Examiners (NBME) – APPD-COMSEP Pilot Project on Pediatrics Milestones – *Study PI for national project (six sites nationally)* [http://learn.appd.org/index.cfm?page=content.cfm&type=2&h1id=1&h2id=266](http://learn.appd.org/index.cfm?page=content.cfm&type=2&h1id=1&h2id=266)

- Project Director for IIPE – 0.2 FTE support to direct national activities to further the development of the Pediatrics Milestones
Journal Publications


Invited Reviews and Chapters


Books


2. Institute of Medicine Committee Member, Workshop on Disability in America: A New Look, Based on a Workshop of the Committee on Disability in America, M Field and A Jette, eds. [Hicks, PJ] The National Academies Press, Washington, D.C. 2006 http://www.nap.edu/catalog.php?record_id=11579#toc

https://www.abp.org/abpwebsite/publicat/primer.pdf


**Internet publications and educational resources**

1. UT Southwestern Pediatric Residency Website

2. Residents’ Continuity of Care Clinic Resource Website (intranet)
   Continuity of Care Clinic Resource Page - A password protected (login is cmcpeds ;no password) website that has original educational modules and handouts (#150) on many general pediatric topics, information for residents on logistics of clinic operations, and resident patient productivity reports. Webmaster and designer is PHicks.
   http://pdweb.dhcp.swmed.org/residents/private/

   http://familymed.uthscsa.edu/ACE/guidebook.htm


5. APPD ShareWarehouse and L.E.A.R.N. – Longitudinal Educational Assessment Research Network. Web-based resource page for sharing of intellectual property in the form of curricular materials, evaluation tools and documents to facilitate implementation of curriculum for resident training. Project involved developing a process where authorship of documents and use/dissemination of documents could be tracked. APPD Share Warehouse webpage