Paediatric team handover: a time to learn?
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ABSTRACT

AIM: Paediatric team handovers provide medical professionals and students with the opportunity to exchange clinically relevant information about patients. This study explored the extent to which learning opportunities existed and were utilised within paediatric team handovers in New Zealand secondary hospitals.

METHODS: We undertook a qualitative, two-site case study within two paediatric departments in 2014 and 2015, and interviewed 29 participants, including medical students, junior doctors and consultants. We conducted a thematic analysis using a general inductive approach.

RESULTS: Participants’ narratives revealed that safe transfer of pertinent patient information between clinicians was the primary function of team handover. They described learning as an additional key component. Most learning opportunities were reported to be informal and opportunistic, related to the specific patients whose care was discussed within each handover. Handover team members indicated that implicit learning occurred as a feature of their handover experience.

CONCLUSIONS: Learning opportunities exist within team handovers and the associated learning frequently occurs either opportunistically or implicitly. Adoption of a reflective approach to learning opportunities is likely to result in improved educational experiences for handover participants, particularly medical students and junior doctors. Handover represents a clinical event within which valuable workplace learning occurs.

Clinical education has traditionally been a curriculum dominated by formal teaching at an undergraduate level and an apprenticeship model at a postgraduate level. Today, clinical education embraces a complex learning environment utilising the principles of adult learning established in the educational literature. Health professionals who work in hospitals and other complex workplace environments experience many learning opportunities of varying levels of formality. Eraut (2000) defined formal learning as learning that occurred within a formal situation, such as within a prescribed learning framework, as an organised learning event or in the context of a formal qualification. He described aspects of informal learning, and included deliberative learning, which occurred in time specifically set aside for the purpose of learning. By contrast, he noted that implicit learning took place when there was no explicit intention to learn and no immediate awareness of learning as it occurred. Between these extremes, he described reactive learning as an almost spontaneous, unplanned event, in which the learner knows that learning is occurring but which might not necessarily be intentional.

Clinical handover has been defined as “the exchange between health professionals of information about a patient accompanying either a transfer of control over, or of responsibility for, the patient”. Handover is accepted as a critical component of patient care within modern health systems, such as hospitals. The requirement for safe, effective transfer of patient information is driven by the contribution of multiple health professionals to individual patients’ care.

Within the handover context, medical staff and students assimilate previously acquired knowledge with new experiences that arise from everyday patient contact, and thus gain from these educational opportunities. Klaber and Macdougall (2009) described variable team handover structures in paediatric teams. They proposed that handover represents a possible but demanding activity.
within which educational opportunities could occur. Because handover is an activity that occurs regularly, they argued that it enables planning for learning to occur. In addition, Nimmo (2014) asserted that uncertainties about patient management voiced by team members provided an opportunity for learning to occur.8

The handover setting thus allows an opportunity within which learning can occur. This literature provoked the following research question: to what extent do educational opportunities occur within paediatric team handovers in New Zealand secondary hospitals?

**Methods**

We purposively selected two New Zealand paediatric departments located within secondary hospitals, which offered 24-hour acute medical services. Both departments had daily morning team handovers that a range of medical staff and students attended. Neither hospital's paediatric handovers routinely involved the presence of nursing staff. At both sites, weekday handovers lasted about 30 minutes and were usually attended by between 7 and 12 practitioners: one or more consultants, several junior doctors and medical students. At each site, the overnight on-duty junior doctor presented each patient listed on a handover sheet, which was maintained by doctors throughout each shift. Inclusion criteria for participation were to be a medical doctor or medical student who had participated in a morning paediatrics team handover at either hospital during the recruitment period (November 2014–January 2015). An administrator at each site offered all current paediatric team members the opportunity to participate in the study, and participants were then enrolled. The interviewer (SB) was available for interviews on three days at each site between November 2014 and January 2015. Participant involvement was thus dependent on staff availability on the days available.

The principal researcher (SB) has considerable experience as a general paediatrician and in team handovers but had never worked or had an educational relationship within either of the two hospitals studied. This decision was purposeful, to avoid any recruitment issues around conducting research involving colleagues or direct reports. This study fulfilled the research component of his Master of Clinical Education degree.9 The two supervisors are researchers with PhDs in educational psychology (MH) and adult education (JE), with extensive understanding of qualitative research methodology. We acknowledged the potential for power imbalance between the researcher and those interviewed.10 The researcher (SB) attempted to take a stance that was non-judgmental, sensitive and respectful of the participants. Advantages of the researcher (SB) being enmeshed within the New Zealand paediatric system included his awareness of the processes being described, the disease conditions alluded to and the health system within which handovers occurred.

The interview schedule employed open-ended questions regarding the handover process, with supplementary structured questions regarding education within the handover process. The questions were developed based on the literature review conducted, appropriate to a qualitative study design, and based on SB's expertise in paediatric medicine to allow the development of themes within the handover process, but also to consider the role of education in this setting. (See Appendix 1). For each interview, digital audio recordings and field notes were made. The notes provided a further lens to assist with the interpretation of the interviewee's transcripts.

A code was assigned to each participant, and each audio-file was transcribed and subsequently reviewed for accuracy. To add a further check on the trustworthiness of the data, all participants were offered the opportunity to review their transcript and withdraw all or part of the transcript data.

We analysed the data inductively and reviewed each transcript several times, allowing coding of pertinent data. We used ATLAS.ti for Mac version 1.5.0 (Scientific Software, Berlin, Germany) qualitative data analytical software, and this resulted in the identification of multiple codes. These codes were collated into themes; further refinement of the codes and themes occurred, which provided understanding of the data in relation to the research question.11 We undertook a detailed analysis of each theme and sub-theme and identified
exemplar quotes using a general inductive technique. To ensure further rigor, two participants reviewed their transcripts and the preliminary themes that these raised prior to the detailed study analysis stage. Both participants agreed with our interpretations.

The University of Auckland Human Participants Ethics Committee approved the research (reference number 012436). We obtained consent to recruit at the two paediatric departments from the team handover members, the Heads of Department and the Chief Executive Officers at each hospital.

Results

Twenty-nine participants were interviewed, of whom 10 were consultants (C1 to C10), 13 were junior doctors (JD1 to JD13) and six were final-year medical students (MS1 to MS6). Junior doctors ranged in experience from house officers in their third postgraduate year of training through to senior registrars, who had six or more years of paediatric experience. Fourteen participants were from Hospital One and 15 were from Hospital Two; 14 were male and 15 were female. The structured interviews had a mean duration of 42 minutes. Two participants accepted the offer to review their transcript; only one made minor amendments to the original transcript. Data saturation was reached after 29 interviews were completed, in that few, new, rich concepts arose in the interviews. Two peer reviewers concurred with the interpretation of the data provided to them, and agreed with the overall themes considered in relation to learning within the handover process.

Themes

Every participant identified that the primary function of handover is to ensure safe, reliable exchange of pertinent information about patients the team provided care for. The other key themes that emerged from the interviews related to the importance of learning within handover. The thematic structure of the reported learning can be described as follows:

1. Informal learning, specifically:
   (a) Opportunistic learning,
   (b) Implicit learning, and
   (c) Reflective learning.
2. Formal and deliberative learning.

Informal learning within handover

The findings in this study indicate that handover contributed to patient safety by providing a regular meeting at which accurate transfer of information and responsibility occurred between team members. Learning was reported as a critical, but secondary function of handover. A medical student stated:

“The most important thing [about handover] would be making sure everyone’s aware of what is happening with the patients, who the patients are and what the plan is for them, if there is anything that they particularly want done. That’s the most important thing, and I guess secondary you could have some teaching if there was an interesting point.” (MS4)

The majority of participants indicated that the principal perceived beneficiaries of the learning were the junior doctors and students. A few junior doctors and most consultants indicated that consultants also experienced learning within handover.

Participants described most learning within handover as informal, which arose in relation to specific patients discussed during team handovers. A junior doctor noted:

“We’re not saying, “and now I will talk about this, and here is [the] introduction, and here [are] my points, and then the finish.” It’s way more informal. It’s just like, “how would you have managed that?” “By doing this.” And then ... “oh, okay”, and that leads on to questions.” (JD13)

Participants portrayed the value of learning within handover as being related to brief learning moments. A junior doctor (JD6) described education within handover as “narrow”, but valued because it contained otherwise inaccessible practice tips. He contrasted this with more formalised learning available in textbooks and through “didactic teaching” and suggested that “there’s a significant teaching component in most handovers”.

Study participants noted the relevance of the informal learning within handover to patients they had seen clinically or discussed. A junior doctor (JD4) found “trying to learn ... a lot easier when the education’s tied to a patient”. Another (JD6) described how “relatable” learning was within handover “because it’s a patient that we’ve seen or it’s an environment that we’re all familiar and comfortable with”. He
commented that “the learning points that you can get in spontaneous teaching in a handover, can be much more powerful than really structured teaching”.

A few participants voiced a concern that an overemphasis on teaching in handover might cause problems with getting the handover performed in a timely way, or that issues discussed might be of little relevance to some members.

Opportunistisch learning

Opportunistisch learning represented the most commonly described form of learning within handover. It was typified by brief, opportunistic learning “moments”. A junior doctor stated:

“I personally learn better by fleshing out a patient, discussing a clinical case you’ve got in front of you. It’s a spontaneous teaching moment, rather than it being someone setting out to: “I’m going to teach you about this”.” (JD6)

Most participants stressed the opportunity handover provided for near-spontaneous teaching moments to occur. Uncertainty about a case prompted brief discussion about a point of diagnosis, management or another related issue.

A student (MS2) commented on the challenge of ensuring that education occurred in the handover. While he described the learning as “opportunistisch”, he indicated that, if team members didn’t consider a potentially educative moment, then opportunistic teaching might not happen. Remembering to provide teaching within handover required “active” thinking by team members, particularly by those who provided leadership within handover.

Implicit learning

Participants described how clinical experiences, including handover, contributed to their understanding about a condition and impacted on management of subsequent patients. In doing so, they described implicit learning occurring.3

A consultant commented in relation to educational opportunities:

“It’s part and parcel of [handover]. People may not be aware specifically that that happens, but every chance to talk about something in the end can be viewed as an educational opportunity.” (C3)

He understood that learning occurred as members handed over patients. Similarly, one junior doctor (JD8) stated: “especially when you’re just starting out in this job, you [are] using every opportunity that you can to soak in information”. She saw handover as a time when junior doctors could be “soaked in” clinical information in order to learn how to function more effectively as doctors.

A junior doctor (JD2) described handover as “like a whole lot of mini case discussions that you hear a brief bit about the history and the diagnosis and treatment”. Their description suggested that team members learned incrementally from hearing about successive cases and internalised the knowledge acquired in this way.

Reflection in handover

Handover allowed participants to consider their management of patients, reflect on what they learned from the interactions, and plan management of patients they encountered in the future.

A junior doctor commented on two children presenting with a medical condition:

“[A child] had this, and then we treated him with this, because of this. And now [another child] comes in with the same thing, and you’re like ... for [the first child] we did that ... because you’re attaching it to memory.” (JD8)

She illustrated that learning from one case informed later management of similar cases for a team member. Another junior doctor stated:

“I’m always trying to figure out, “what would I have done if that was me? Would I have done it the same?” And then, actually using that as an opportunity to either say how I would have done it, or to say, “well that’s how they’re doing it. Maybe I’ll try that next time”.” (JD10)

Another junior doctor (JD9) described “[putting] yourself in their shoes” as the team listened during handover, “and it might be you tomorrow that’s on call.” The reflection allowed her to consider how she might respond if she saw a similar patient “in the future”.

Formal and deliberative learning

Many of the study participants were undertaking formal university degree or diploma courses. However, none of the participants described the handover process.
as part of those formal processes. Deliberative learning, where educational time was specifically set aside adjacent to handover, did not occur overtly within the study participants’ usual handovers. A junior doctor (JD3) referred to separate “teaching sessions fortnightly, or weekly ... secure teaching sessions for the whole team”, where cases could be subsequently discussed.

One junior doctor recounted a particularly valuable handover experience in another team he had worked with, where:

“... you’d try and get through the aspects of handover quickly, and then one of the [junior doctors] would present a topic. And it was semi-structured ... there was a PowerPoint presentation ... and it would be just five to ten minutes, and it could be case-based.” (JD6)

Participants did not routinely report deliberative learning of this type within the specific team handovers immediately prior to being interviewed. However, several reported having experienced this type of learning in earlier handovers. They saw value in such sessions, particularly when the teaching related to a patient for whom their team had recently provided care.

Summary of results

Participants perceived learning as an important function of the team handover process, provided the issue of patient safety remained prioritised. They valued brief, opportunistic learning that occurred in relation to specific patients their team was providing medical care for. They particularly valued the opportunity to understand diagnostic, management and prognostic issues relevant to their patients. Participants acknowledged that important implicit learning occurred within the handover meeting. The meeting provided an opportunity for reflection on issues that arose in the handover, which in turn reportedly influenced future clinical encounters. Many participants acknowledged that deliberative learning had been part of other team handover experiences and had been valuable for them. However, they generally described the more informal, opportunistic learning as of greater educational value to them because it related to specific patients.

Discussion

These findings reveal that learning opportunities existed within paediatric team handovers in New Zealand secondary hospitals. In the following analysis, we will consider key elements that emerged from the findings.

Participants identified patient safety as the primary reason for handover and one means by which team members decreased the likelihood of missing critical clinical issues. These findings reinforce the literature consensus regarding the primary purpose of handover, namely that it allows effective continuity of care by transmission of essential information between clinicians.

Our study supported the view that team handovers provide an excellent opportunity for workplace learning. The findings affirm that learning took place within a professional setting, and thus provided meaning to learning. During handover, clinical teams gather, communicate and learn. Participants from both sites portrayed their handovers as meeting these functions, and described learning as a secondary, but important function of handover. They described the simultaneous occurrence of working and learning within the handover setting, and that learning was influenced by the clinical work. One described significant “teaching component[s] in most handovers”, and many reported that patients’ clinical problems discussed within handover were directly relevant to them. For example, clinicians involved in the handover often needed to leave their handovers to manage the actual patient, and this requirement made learning within handover meaningful to team members, and gave the learning immediacy. Cohen and Hilligoss (2010) noted that health professionals need to maintain significant rates of continuous learning, and that handovers are an important event within which this vital learning can occur.

The themes related to learning were congruent with those described by Eraut (2000), but we suggest modifications within the team handover situation. We believe
that a summary of learning methods within handover provides contributors with a framework that can inform their own team handovers. In Table 1, we consider the key concepts depicted in Eraut's typology and apply these to the handover setting by integrating the themes which emerged within this study.

Participants did not report that formal learning had a significant role within the handovers studied. Deliberative learning was not a feature of the studied handovers, although several participants commented on its usefulness in other team handovers. Brief, planned teaching relevant to a recently-treated patient often typified this type of deliberative learning, and represents one way in which the handover meeting can be adapted for learning. The planned nature of both formal and deliberative learning prompted us to consider these types of learning as distinct modes from the more informal learning that participants described in relation to their handover learning experiences.

All participants focused on informal learning within handover positively due to its relevance to their work. Teaching within handover was reported as “narrow”, but specific to patients’ actual clinical problems. Stephenson (2001) noted that learners at work incidentally accumulate specialist knowledge and skills through experience. The description of informal learning and of “teaching moments” within handover resonates with Stephenson’s description.

Study participants described the recognition of knowledge gaps, and the use of questions that allowed brief, spontaneous, rich learning opportunities that were relevant to the patients discussed and met their learning needs. Several participants described this type of learning as “opportunistic”, which resulted in brief teaching within handover. They emphasised the near-spontaneous nature of learning which the handover structure enabled. Eraut (2000) suggested within his typology that “reactive” learning involves “incidental noting of facts, opinions, impressions and

Table 1: Modes of learning within team handover.

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ideas", a feature of the handover dialogue described in this study. He linked this with a recognition of learning opportunities and suggested that learners and teachers could maximise reactive learning by being prepared for these learning opportunities.3

Active conversation between handover team members is important, as it allows the opportunity for assumptions to be questioned, and areas of uncertainty to be raised.8,19 Within this study, the term “opportunistic” was used repeatedly by participants and appears to reflect the way that teaching and learning usually occurred in this context. We prefer to use the term “opportunistic learning” rather than “reactive learning” in relation to this important form of learning within the team handover context. The role of opportunistic learning in handover has been alluded to in previous literature,4,7,19 but this study explicitly draws attention to this as a critical mode of learning for handover members.

Implicit learning is “the acquisition of knowledge that takes place largely independently of conscious attempts to learn”.20 Participants described handover contributing to their understanding of patients’ conditions, and such learning was “part and parcel” of each handover, but team members might “not [be] aware specifically that that happens”. Others described handover as an “opportunity that you can soak in information”. Overall, participants perceived that learning within handover impacted positively on their ability to deal with subsequent patients with similar clinical presentations. Participants’ remarks have resonance with Hilligoss and Cohen’s (2011) statement that “every [handover] interaction is an opportunity for the participants to learn, in the sense of altering the skills and assumptions that will shape their actions beyond their work with the patient at hand”, thus creating an opportunity for implicit learning.15 This study did not explicitly focus on the acquisition of implicit learning in handover. However, it seems likely that the rich, probing dialogue described by participants within typical handovers allowed implicit learning to occur.

The findings reinforce those of Egan and Jaye (2009), who considered learning within clinical placements for New Zealand medical students. They noted that learning depends on the opportunities that arise and clinicians’ response to these clinical encounters, and that medical students learn from applications of knowledge in ways that are practical and informal.21 Implicit learning was described as a key means of learning within this study, and this adds to the body of evidence that the hidden curriculum forms a major factor in students’ and junior doctors’ acquisition of knowledge, skills and attitudes.22,23 The implication of this is that the way the handover occurs, including the nature of the interactions, may be critical as to whether the more junior members of the team are able to learn. In short, the team atmosphere is important, and handover leaders may wish to consider whether their handovers invite juniors to interact within them.

Handover members discussed patients they had just seen and understood that they had to either acquire knowledge or interpret existing knowledge in this context to deal effectively with these patients’ presentations, diagnoses or management. Participants portrayed this learning as reflective, in that professionals learned about something while they were doing it.24 They described hearing about a patient’s management during handover, asking whether they would have managed the child in the described manner, and then deciding, “maybe I’ll try that next time”. Handovers thus provided the opportunity for participants to reflect on their and others’ management of a patient after the clinical event.24 Some participants reported “putting [themselves] in [their colleagues’] shoes”, understanding that “it might be [them] tomorrow”. Because the same or similar patients were discussed on a regular basis in handovers,7 this allowed reinforcement of understanding about specific patients’ conditions and what management steps proved helpful. Reflection has been described as “the engine that shifts surface learning to deep learning”.25 Many opportunities for reflection within clinical practice occur after meaningful “teachable moments”.26 Those involved in handovers might usefully consider specific patients about whom it would be instructive for participants to spend time during handover discussing their clinical presentations. An awareness of the gaps in understanding of the doctors
and students in specific handovers might allow leaders the opportunity to tailor these teachable moments. We consider this to be an important way in which consultants can prepare for handovers. Many conditions are seen frequently, and they can be prepared with a 30- to 60-second teachable moment relating to a common condition or investigation, which in turn may greatly assist more junior members of the team in understanding their patients. The study findings support the importance of reflective learning within the handover process, as handover provides a valuable environment in which teachable moments and reflection occur. The central role of reflection that is precipitated by the team handover process has prompted us to include this as a key mode of learning within handover.

The study raised a note of caution about an overemphasis on education within team handovers. The principal function of handover is allowing the handing over of essential information, and several participants expressed a concern about the need to balance education as a brief but important component of handover. If handover participants can perceive the importance of implicit learning and that relatively brief, opportunistic teachable moments can be powerful means by which learning may occur, then concerns about an overemphasis on education may abate.

This study has the limitations implicit in qualitative research: the findings are not generalisable to other team handover situations. Even though this study involved handovers in two New Zealand paediatric departments, the process of investigation and many of the emergent ideas will likely have relevance for other medical team handovers in other contexts. Qualitative interviews can provide important insights into people’s views and experiences, but are limited by individuals’ abilities to recall detailed information. While study participants reported during the interviews that they found handovers a rich education experience, this study was not focused on quantifying measurable changes in learning. Nonetheless, it was because of the need to reach an understanding of the rich complexity of learning within handover that a qualitative methodology was adopted. Indeed, qualitative research’s emphases on rich description of context, naturalistic inquiry and transferability of findings allowed the ability to probe deeply into participants’ perceptions of handovers in a way that an observational study or a questionnaire-based study would not have.

The potential exists for team handovers to be potent learning encounters within which clinicians and students can actively learn. While patient safety remains the critical focus of handover, team members value brief, opportunistic “teachable moments” that are directly relevant to the patients that they are discussing and treating. Handover leaders might usefully consider whether some “teachable moments” are predictable and prepare for them. Handover allows participants multiple opportunities to reflect on their practice in the context of their own and other clinicians’ patient management experiences: this process might be encouraged by handover leaders, specifically by the use of appropriate questioning within the handover. The role of implicit learning within handover needs careful consideration by handover participants. Leaders might usefully consider the quality of interactions within the handover process, and whether this could be improved to allow a more supportive learning environment.

Future research could explore similar themes within other team handover situations, such as with other specialty groups, in larger hospitals, with inter-professional teams, and in other countries with different medical systems. An observational study could be planned in which researchers observed actual handovers for potential educational and learning moments.

Conclusion

In summary, the participants viewed team handovers as having an essential safety function but described learning as representing a valuable secondary function. Most learning represented informal workplace learning, with an emphasis on opportunistic learning which arose from discussion about specific patients. The ability within handover to reflect on the participants’ own and others’ clinical practice allowed a powerful opportunity to learn from these experiences. Within handover, implicit learning appeared to be a critical process by which participants improved their understanding of clinical practice and modelled behaviours. It is suggested that handover participants reflect on the ways in which their practice enables learning to occur, and that senior team leaders consider whether brief teachable moments could become integrated into their handovers. Paediatric team handover represents a time to learn.
Appendix 1: Interview schedule

Introduction
Tell me about yourself.
What position, age group & ethnicity do you identify with?
How long have you worked at this DHB? How long have you been in your current position?
How much time have you spent working in paediatrics since graduating?

Handovers
Tell me what you see as positive aspects of the team handover process?
Tell me what you see as negative aspects of the team handover process?
What do you see as the important priorities for paediatric team handover?
In the most recent paediatric team handover which you were part of, what went well?
Why did it go well?
What went less well? Why?
Tell me about any specific issues.

Education
To what extent do you think that education is an important part of the team handover process?
Please identify any educational opportunities that occurred in the most recent paediatric team handover which you were part of.
How were the educational opportunities handled?
Who did you think was involved in the educating?
To whom was the education directed?
To what extent do you think that the participants’ educational needs were being considered?
Who raised any educational issues?
Can you give examples of where you or your paediatric team would turn to in order to answer questions raised in a team handover? For example, books, personal knowledge or internet sites?
If education has a role in paediatric team handover, what is it?
Can you identify instances of missed educational opportunities within the most recent paediatric team handover which you were part of? Explain.
If you identified an educational question you were still uncertain about at the end of a team handover, how would you address the question?
What educational areas do you see as important during paediatric team handovers?
To what extent are team issues and/or communication issues important in the paediatric team handover?
To what extent does the paediatric team handover allow participants to ask educational questions?
Can you describe any barriers to asking questions in a paediatric team handover?
To what extent do you think that junior members of the team can ask educational questions?
When questions get asked, who usually provides the answers?
What would enable more education to occur in the paediatric team handover?
What barriers do you identify to education occurring in the team handover?
Within the handover process, is there a conflict between education and the service requirements?

Closing questions
Do you have any other comments?
Do you have any other questions?
Competing interests:
Nil.

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