



## Passing the buck: clinical handovers at a New Zealand tertiary hospital

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### Abstract

**Aims** To survey house officers and nurses regarding timing, structure and content of clinical handover and compare these results. Secondary aims included the development of an 'on-call' sheet and the development of guidelines for handovers from the results collated.

**Methods** 60 house officers (post graduate years 1–3) and 60 nurses working at Auckland City Hospital were asked to complete a survey covering various aspects of clinical handover in their current department.

**Results** This study showed that nurses have more handovers than house officers in a 24-hour period. Nurses had an average of 3.2 handovers compared with the 1.2 handovers reported by house officers. Nurses rated their handovers as 'good', with a mean score of 7.8 / 10, while house officers rated the standard of their handovers as only 'average', with a mean score of 5.1 / 10. This was noted to be a statistically significant difference with a p-value of 0.01. Our study found that 60.9% of house officers reported that they had encountered a problem at least seven times in their most recent clinical rotation that they could directly attribute to a poor handover. However, nurses reported a much lower incidence of problems relating to poor handover standards, with 37.5% of this group indicating that they had experienced a clinical problem with a patient related to a nursing handover.

**Conclusions** In this study, we identified that health professionals perceive that clinical problems can be attributed to poor clinical handover. The majority of respondents in the study felt that an effective handover system should include a set location for handover, a standardised 'on-call' sheet and training related to handovers.

Clinical handover can be defined as the transfer of responsibility for care of patients between health care professionals.<sup>1–3</sup> With the ever-changing face of working hours for doctors, the domain of handovers has come under scrutiny in recent years.

Within the New Zealand setting, little research has been conducted in this area and worldwide there is sparse literature about junior doctor handovers. An investigation of handover practice in New Zealand and a desire to improve this area will benefit both patients and junior doctors.

As junior doctor work hours decrease, the number of handovers conducted should logically increase.<sup>1</sup> In addition, the benefit of the patient being treated by a less fatigued doctor may be offset by the risk of information breakdown due to poor handover practices and systems.<sup>4</sup>

A recent study at Auckland City Hospital (ACH) showed that medical patients would see on average 1.3 new doctors in a day and surgical patients would see 1.5 new

doctors in a day.<sup>5</sup> In an entire hospital admission, medical patients would see an average of 6 doctors and surgical patients would see an average of 10 doctors.<sup>5</sup>

*Safe Handover: Safe Patients' Guides* were released in August 2004 in the UK and January 2007 in Australia.<sup>2,3</sup> These guides highlight best practice for clinical handovers and also highlight common mistakes and pitfalls in clinical handover.<sup>2,3</sup>

This study looked at the views of house officers and nurses on the standards of their clinical handovers. Nurses currently do conduct formal handovers at their shift change and the perception prior to the study was that these handovers were effective.

## Methods

Auckland City Hospital has 780 bed-spaces and serves a patient population of approximately 420,000.<sup>6</sup> There are 122 house officer positions at ACH.<sup>7,8</sup> On average across all specialties, an on-call (out of hours) house officer will be responsible for approximately 50 patients<sup>6,7</sup>.

Most of the adult specialties have house officers working Monday to Friday, between 0730–1600 for surgical specialties and 0800–1600 for medical specialties. Many of the on-call rosters are combined such that one house officer covers between one to six specialties from 1600–2200 and from 2200–0800<sup>7</sup>. A long day is classified as working from 0730 or 0800 to 2200.

At 1600 therefore, one house officer becomes responsible for duties of multiple house officers, so there is potential for a large transfer of information at this point. Night duties are classified as the shift from 2200 until 0730 or 0800.

Ideally there is potential for at least three handovers to occur for every service in a 24-hour day. At the time of this study there were no formal guidelines or protocols in place for clinical handover at ACH, although the General Medicine Department did conduct a consultant-led handover each morning at 0800 and a registrar-led handover at 2200 daily.

A survey of 60 house officers and 60 nurses was conducted in mid-March 2006.

Surveys were distributed to all adult medical and surgical specialties at ACH. This equated to eight on-call rosters being investigated: General Medicine, Psychiatry, OPH, General and Vascular Surgery, Orthopaedics and Urology, ENT and Neurosurgery, Cardiology/CTSUs, and Medical Subspecialties. (See the survey questions in Appendix 1.)

Using the on-call rosters at ACH, the authors calculated the average number of times a house officer would be on-call for each roster as well as the overall average across all services in a 3-month rotation. On-call periods were defined as long days (i.e. 1600–2200 shifts), nights (2200–0800) and weekend call days as well. We calculated that in a 3-month rotation house officers would be 'on-call' an average of 22.6 times.

The survey used numeric scales (range 0–10) with a word description related to a range of scores.

Data was collected and entered into a Microsoft Excel spreadsheet. For each survey question, the results were entered into an Excel table and bar and pie graphs were used to illustrate the results. A mean score was calculated using Microsoft Excel for the 'standard of clinical handover' question to assess the significance of the difference between the sample populations.

Simple comparison tables and graphs were used for the remainder of the survey questions to ascertain any differences between the sample populations.

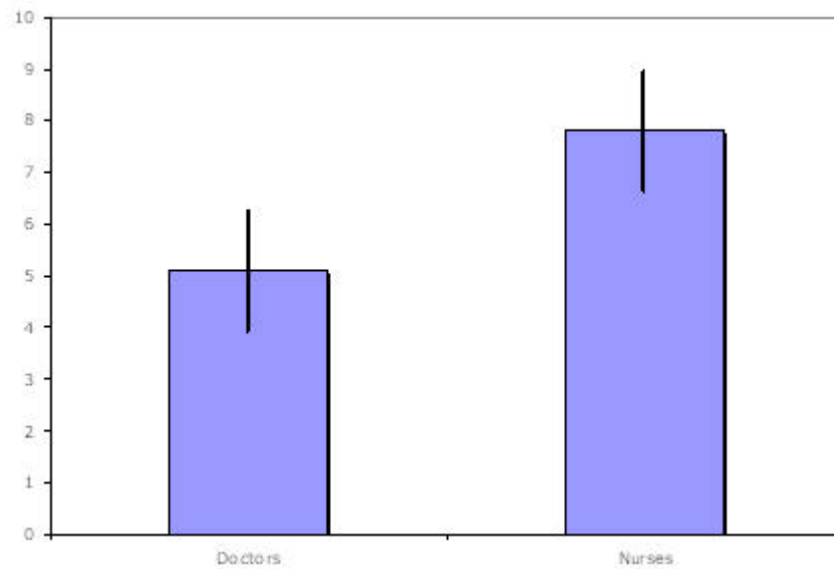
## Results

We received 41 house officer (56.2%) survey responses, and 32 (43.8%) responses from the nurses.

The average number of handovers attended in a 24-hour period for house officers was 1.2 (range 0–3) compared to 3.2 (range 1–4) in the nurses study population.

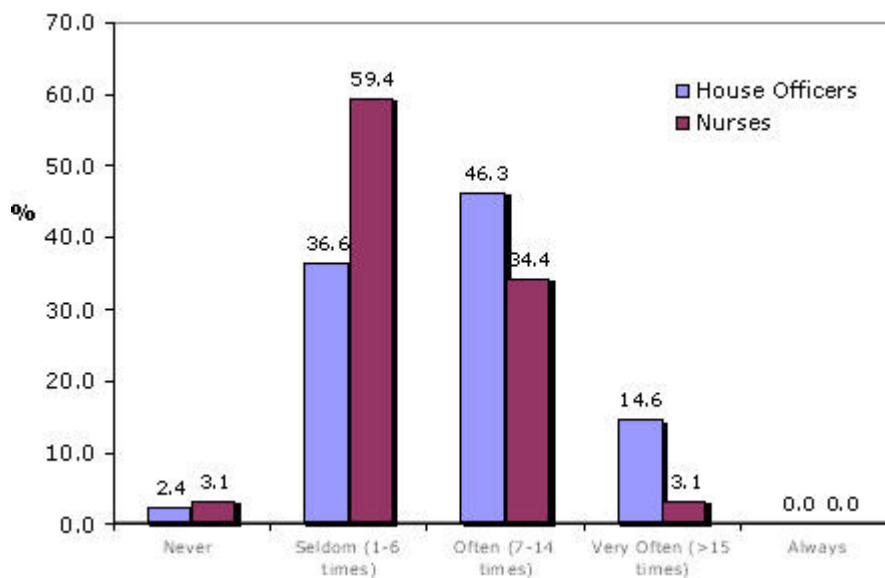
The mean score for 'standard of handover' in the house officer population was 5.1 (a rating of 'average' on our scale) with the mean score in the nursing population being 7.8 (a rating of 'good' on our scale) ( $p=0.01$ ). See Figure 1.

**Figure 1. Mean score comparison for standard of handover**



A significant number of house officers (46.3% = 19 respondents) felt that they had experienced a clinical problem at a frequency of 7–14 times in the previous 3-month rotation. All but one of the respondents in both populations indicated that they had experienced a clinical problem directly related to a poor handover at least once in 3-month rotation. (See Figure 2.)

**Figure 2. Frequency of clinical problems encountered related to a poor handover in a 3-month rotation period**



56.1% of house officers indicated that they felt an effective handover could be conducted in 10 minutes compared to the nursing population where 50% felt that more than 20 minutes is required.

A majority of house officers (54%) indicated that they were seldom paged during a clinical handover.

43% of house officers felt that the introduction of a set location for handovers would be the most effective intervention to improve handovers and 31% felt that the introduction of an 'on-call'/handover sheet would be the most effective. All house officer respondents indicated that these two interventions would improve handovers however. (See Table 1.)

**Table 1. Frequency and ranking of interventions for improving handover by house officers**

Intervention	Total number of times 'ticked'*	Ranked 1*	Ranked 2*	Ranked 3*	Ranked 4*	Ranked 5*
Set location	100%	43%	21%	5%	9.5%	0%
RMO Sheet / On-call Sheet	100%	31%	13	14%	5%	0%
Q card / Guidelines	48%	7%	2%	17%	5%	14%
Electronic handover	45%	2%	7%	9.5%	9.5%	12%
Training seminar	69%	14%	26%	12%	5%	5%

\*In some instances respondents neither ranked nor ticked interventions.

## Discussion

In this study we analysed the opinions of house officers and nurses about current clinical handovers. In a large study conducted in The Netherlands, it was shown that faults from medical handover affect 6.1% of patients admitted to various teaching hospitals.<sup>9</sup>

This study confirmed that clinical error in patient care can be partially attributed to poor clinical handover and as such, that clinical handover is an area with potential for quality improvement.

Our study approached the area of clinical handover from a slightly different perspective, asking what junior doctors and nurses felt about their handovers. This approach was taken to ascertain the views of junior doctors and nurses and also to gain a perspective into the areas they felt needed improvement. Ultimately it would also serve as a method of gaining 'buy-in' from some of the stakeholders should changes need to be made to clinical handover practices.

Our results indicated that the majority of house officers felt that clinical handover did not occur often enough and that the standard at which it did occur was 'average', with the mean score being 5.1/10. In our opinion, this can be attributed to a number of factors that include poor or little training with regard to conducting clinical handover,

inadequate systems/guidelines, poor leadership in regard to clinical handover, and the lack of a set location and time for handovers to occur between junior doctors.

The authors acknowledge that there was a relatively low response rate from both the house officer and nursing groups in this study (68.3% and 53.3% respectively). However, in these study populations, this is a common occurrence and we additionally feel that the results and conclusions drawn are still relevant in the New Zealand health setting.

Furthermore, the authors also recognise that the scale used to measure the standard of clinical handover in this study was arbitrary and lacked definition in regard to the categories used. The results do, however, indicate that the handovers between house officers are perceived to be at a lower level than that of nurses (house officers' mean score 5.1 and nursing mean score 7.8,  $p=0.01$ ).

The results also support the hypothesis that clinical problems arise due to this 'average' standard of clinical handover—with our study showing that the majority of house officers encountered a clinical problem due to poor handover at a frequency of 7–14 times in their previous 3-month rotation.

Our study results should be viewed within a worldwide context where there is a trend towards a reduction in junior doctors' working hours and a subsequent increase in the number of shifts and therefore the number of handovers conducted.<sup>1,4</sup> Lack of information when a patient requires urgent care is clearly a clinical risk. Various studies have shown that medical error is also more likely to occur immediately after a shift change.<sup>4</sup>

During 2005, a survey across 17 hospitals in Wales produced similar results to those of our study: There it was found that there was no allocated place for handover and none of the hospitals had a pager-free handover period.<sup>4</sup> Personal lists were used in most hospitals to record outstanding jobs etc and handover proformas were only developed by two hospitals<sup>4</sup>. Indeed, many recent studies have shown that the benefit of being treated by less tired doctors who work less hours in shifts can be offset by information breakdown due to poor handover practice.<sup>1,4,10</sup>

Our study demonstrated that the perception of nursing handover is considered to be at a higher level than that of house officers. Nursing handovers at Auckland City Hospital follow a similar model to those used internationally. Handovers occur at a specific time and location and these times are protected—i.e. they are included in the roster and there is an overlap between incoming and outgoing shifts for the nurses.<sup>11</sup>

These practices are well established and known to all nurses. During undergraduate training, nursing students are also often expected to attend and take part in these handovers.<sup>11</sup>

With the current trend to reduce junior doctor working hours and the move to more frequent handovers, the *Safe Handover: Safe Patients* guidelines were introduced to outline best practice for medical clinical handover. These were developed by the BMA initially in the UK and later by the AMA (Australia).

The guidelines state that as a minimum an effective handover should include the following:<sup>2,3</sup>

- A set location and set time.
- Be designated pager-free except for emergencies.
- Have access to IT systems to access patient information.
- Have clear leadership and supervision.

Based on our study results, it would appear that the house officers and nurses surveyed agree with these basic principles to improve handover. All house officers surveyed felt that a set location and a standardised 'on-call/handover' sheet (proforma) would improve clinical handover.

In relation to 'what' should be handed over, the authors developed the 'JUMP' mnemonic based on the literature and discussion with both junior and senior doctors.

The JUMP mnemonic is broken down as follows:

- J** Jobs outstanding
- U** 'Unseen' patients (i.e. patients waiting to be seen in ED)
- M** Medical contacts (i.e. the pager/mobile phone numbers of registrars/consultants with whom the previous house officer has discussed patients)
- P** Patients to be aware of...

The final category in the JUMP system refers to those patients that may not necessarily need to be seen, but who may present a clinical emergency at some point. This also provides the opportunity for junior doctors to be pro-active and possibly check on this category of patients when they are not very busy.

Literature around information technology (IT) support of handover is beginning to emerge in Australia<sup>1</sup>. Although, this was not looked at in this study, this is an area that will need further investigation in the future. The authors believe, however, that one of the key principles to effective handover is simplicity and therefore any IT support system must be practical and easy to operate.

In summary, the significant findings of this study were that nurses have more handovers than house officers. Currently, nursing handovers are perceived to be at a higher subjective standard than the handovers conducted by house officers.

A notably larger percentage of house officers reported problems directly attributable to a poor handover as compared with nurses, with over 60% of house officers stating that they had encountered at least 7 problems in a 3-month period.

At Auckland City Hospital, handover practices will continue to be monitored as this is an area that, if improved, will benefit both patients and junior doctors by improving job satisfaction through a reduction in stress during 'on-call' working periods.

Further investigation about clinical handover should occur in New Zealand to ensure that patient safety is maintained.

**Competing interests:** None.

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**APPENDIX 1**

Post-grad level: ..... Previous rotation: .....

**HOUSE OFFICERS' HANDOVER SURVEY - ACH**

This survey relates to handovers between junior doctors at change of shift / end of duty. Please circle or tick the response you feel most appropriate. Please fill in the information at the top of the form. There are 2 pages!

1.) How many handover periods would you attend in your previous run over a 24 hour period? (Circle One)

Zero                  One                  Two                  Three                  >Three

2.) How would you rate the standard of handovers between house officers at ACH on your last run? (Circle a number – Responses relate to the descriptions as marked.)

Very Poor      Poor                  Average                  Good                  Excellent  
0      1      2      3      4      5      6      7      8      9      10

3.) How regularly were you paged whilst receiving or giving a handover? (Circle one – Responses relate to the scale below. Based on ~23 on-call shifts per rotation.)

Never                  Seldom                  Often                  Very often                  Always  
0                  1-6 times                  7-14 times                  >15 times

4.) How regularly did you encounter a clinical or work related problem during your duty that you can relate to a poor handover or a lack of information received during handover? (Circle one – Responses relate to the scale below. Based on ~23 on call shifts per rotation.)

Never                  Seldom                  Often                  Very Often                  Always  
0                  1-6 times                  7-14 times                  >15 times

5.) How much time do you feel is required for an effective handover?

<10min                  10min                  15min                  20min                  >20min

6.) Tick the 'interventions' you feel will improve the effectiveness and efficiency of house officer handovers.

	Tick	Rank
Set location for handover to occur for each service	<input type="checkbox"/>	
Sheet for RMOs to carry to list jobs / patient details	<input type="checkbox"/>	
Cue-card with checklist for conducting handovers issued to each RMO	<input type="checkbox"/>	
Electronic handover system	<input type="checkbox"/>	
Training seminar on handovers	<input type="checkbox"/>	

7.) List any other interventions you feel would improve the effectiveness and efficiency of junior doctors' handovers.

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8.) Tick the information / details you feel is relevant or important to always include in a handover between junior doctors.

	Tick	Rank
Patients to be aware of / possible calls	<input type="checkbox"/>	
Outstanding Jobs (incl. pt's to clerk)	<input type="checkbox"/>	
Results to chase	<input type="checkbox"/>	
Items to handover to next on-call	<input type="checkbox"/>	
Important numbers (incl mobile + pager for Regs)	<input type="checkbox"/>	
Patient locations	<input type="checkbox"/>	
Very sick pt's / expected deaths	<input type="checkbox"/>	

List any other information you feel should be included in handovers....

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9.) Please make any further comments or suggestions in regard to handover between junior doctors.

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Please hand to Pat Starkey at CETU if you cannot return the form at the end of the teaching session.

Thank you for your time.