



Research paper

Nursing handover from ICU to cardiac ward: Standardised tools to reduce safety risks



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ABSTRACT

Background: Standardising handover processes and content, and using context-specific checklists are proposed as solutions to mitigate risks for preventable errors and patient harm associated with clinical handovers.

Objectives: Adapt existing tools to standardise nursing handover from the intensive care unit (ICU) to the cardiac ward and assess patient safety risks before and after pilot implementation.

Methods: A three-stage, pre-post interrupted time-series design was used. Data were collected using naturalistic observations and audio-recording of 40 handovers and focus groups with 11 nurses. In Stage 1, examination of existing practice using observation of 20 handovers and a focus group interview provided baseline data. In Stage 2, existing tools for high-risk handovers were adapted to create tools specific to ICU-to-ward handovers. The adapted tools were introduced to staff using principles from evidence-based frameworks for practice change. In Stage 3, observation of 20 handovers and a focus group with five nurses were used to verify the design of tools to standardise handover by ICU nurses transferring care of cardiac surgical patients to ward nurses.

Results: Stage 1 data revealed variable and unsafe ICU-to-ward handover practices: incomplete ward preparation; failure to check patient identity; handover located away from patients; and information gaps. Analyses informed adaptation of process, content and checklist tools to standardise handover in Stage 2. Compared with baseline data, Stage 3 observations revealed nurses used the tools consistently, ward readiness to receive patients (10% vs 95%), checking patient identity (0% vs 100%), delivery of handover at the bedside (25% vs 100%) and communication of complete information (40% vs 100%) improved.

Conclusion: Clinician adoption of tools to standardise ICU-to-ward handover of cardiac surgical patients reduced handover variability and patient safety risks. The study outcomes provide context-specific tools to guide handover processes and delivery of verbal content, a safety checklist, and a risk recognition matrix.

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1. Background

Highly variable processes for clinical handover during the transfer of professional responsibility and accountability for the care of

patients,¹ in complex handover situations in high-risk clinical settings increases the risk for serious adverse events and patient harm² resulting from handover miscommunication.³ Ineffective communication and poor quality handover information^{4–7} are identified consistently as lead contributing factors in serious events both in Australia^{8–10} and internationally.¹¹ Guidance provided in Standard 6 of the Australian National Safety and Quality Health Service (NSQHS) Standards recommends standardisation as key to systems and strategies for effective communication during the transfer of patient care.¹²

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Patients transferring from an intensive care unit (ICU) to a general ward are particularly vulnerable to preventable harm due to the high volume of complex information to be communicated to ward staff and the transition to reduced monitoring.¹³ Examination of the complex process of discharging patients from ICU to a ward suggests that discharge information is often transferred to care coordinators but not communicated adequately to ward staff,^{14,15} and a recent systematic review highlights a lack of comprehensive evidence of strategies to improve ICU-to-ward handover.¹³ Standardisation of nursing discharge processes is recommended to ensure that handover information reaches the ward nurse/s responsible for ongoing patient care.¹⁴

The aim of this pilot study was to adapt and evaluate evidence-based tools to standardise clinical nursing handover during the transfer of cardiac surgical patients from ICU to a general cardiac ward to reduce risks to patient safety. Tools developed in a previous multi-site study¹⁶ to standardise anaesthetist-to-nurse handover at the bedside in Post Anaesthetic Care Units (PACUs) were adapted to the similarly high-risk ICU-to-ward context. Data on context, current practices and risks to safety were gathered to inform both adaptation of the PACU tools and strategies to implement and evaluate the new tools.

The PACU handover tools centre on a four-step process represented by the acronym, COLD: *Connect* equipment; *Observe* the patient; *Listen* to verbal handover; and *Delegate* responsibility for ongoing care.¹⁶ The process incorporates an established framework for communication of verbal content, ISOBAR^{17,18} (Identity, Situation, Observations, Background, Assessment, Recommendation), a safety and quality checklist, and a risk matrix to classify levels of risk (Standard, Medium, High) in handover. These tools were developed through observation of good practice and a rigorous process of clinician involvement and validation to produce a context-relevant approach to standardised handover.^{16,19}

2. Methods

The study was conducted in a metropolitan private hospital with a 15-bed, level 3 ICU with a high turnover (1919 admissions in 2013 averaging 36 patient transfers per week to all wards) and a 46-bed cardiac surgical ward. Ethical approval was obtained from the hospital and affiliated university Human Research Ethics Committees (LR08112).

A three-stage multi-method pre-post interrupted time-series design incorporated focus group interviews with stakeholders and observation of episodes of handover by ICU nurses transferring care of cardiac surgical patients to cardiac ward nurses pre- and post-implementation of tools to standardise ICU-to-ward nursing handover. Registered nurses (RNs) in the ICU and the cardiac ward were informed of the forthcoming quality improvement project and their involvement invited via emails, posters and information sessions for a two-week period prior to commencement of data collection. Participating ICU RNs were required to have at least three months experience in the ICU.

2.1. Sample

The study sample was 20 consecutive episodes of ICU-to-ward handover for patients transferred during weekday day-shifts observed pre-implementation of tools and a further 20 episodes post-implementation. Previous handover research¹⁶ indicated that 20 episodes were expected to provide a heterogeneous sample to capture variability in key elements of handover practices. Sixty-eight ICU and cardiac ward RNs expected to be observed during these handovers provided prior written consent to be observed during an episode of clinical handover. No nurse declined to be

observed. As the focus of data collection was the episode of handover, written consent of patients was not required; their informed verbal consent for the observer to be present was sought at the time of handover.

A purposive sample of 19 stakeholders, senior nurse managers and clinicians selected to capture a range of knowledge and experience, was invited to participate in focus group interviews pre- and/or post-implementation; written consent from those participating was obtained at the time of interview.

2.2. Stages

The aim of **Stage 1** was to establish current handover practices and identify risks to patient safety. Data from 20 consecutive nursing handovers during cardiac surgical patient transfers from ICU to the cardiac ward were collected over four-weeks using naturalistic observations of preparation for and processes of handover in the 'real world' clinical environment, and audio-recording of the spoken content. A single trained observer recorded the time of patient arrival and duration of the verbal and entire handover process, and noted observations in unstructured field notes and a semi-structured audit tool modelled on the steps of the COLD handover process. Prior to the observations, a focus group interview with six of 11 invited nurse stakeholders, three each from the ICU and cardiac ward, was used to explore procedures and problems related to ICU-to-ward handover.

Stage 2 involved adaptation of the PACU handover tools to the ICU context informed by analysis of data from Stage 1. Tool design was refined and verified with input from clinicians and senior nurse stakeholders. The adapted tools were introduced into the ICU and ward using a four-week education programme and a two-week wash-in period informed by principles from evidence-based frameworks^{20–22} for practice change: organisational and staff involvement; communication; and resource allocation. Implementation strategies tailored to the context of the work culture and clinical environment²³ included 21 information sessions (10 in the ICU and 11 in the cardiac ward) attended by 71 nurses (50 from the ICU and 21 from the cardiac ward), debate and discussion with clinicians during in-service sessions, one-to-one coaching conducted in the ICU and cardiac ward, reminders in the form of posters of the adapted tools placed on ward notice boards, and a one-page summary of the adapted standardised process and content tools distributed to clinicians.

The aim of **Stage 3** was to assess the uptake and usability of the tools, and identify risks to patient safety. The observation procedures used in Stage 1 were repeated for 20 consecutive nursing handovers over a five-week period. After completion of the observations, a focus group interview with five of eight invited nurse stakeholders, three from ICU and two from the cardiac ward, was used to introduce preliminary findings and verify the design of the adapted tools to standardise handover.

Demographic data of nurses (years of experience, years in current ward and employment status) and patients (age, sex, type of surgery, lines including pacing, ICC, IV access, IDC, oxygen therapy and monitoring during transport) were collected in Stages 1 and 3.

2.3. Data analysis

Descriptive statistics were used to summarise demographic and observational frequency data. All audio recordings of verbal handovers and focus group interviews were transcribed verbatim for analysis. A two-stage process was used to analyse qualitative data collected in Stages 1 and 3. First, deductive content analyses used framework analysis; this method used a "structured topic guides to elicit and manage data".²⁴ The steps of the handover process, COLD (Connect, Observe, Listen and Delegate) were used

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