

**A Structured Evidence-based Literature Review
regarding the Effectiveness of Improvement
Interventions in Clinical Handover**

Prepared by



**The eHealth Services Research Group,
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Executive Summary

This document provides a structured evidence based literature review regarding the effectiveness of improvement interventions in clinical handover covering Australian and International published works. The review is presented in a manner that includes summaries of papers, reviews the strength of evidence and synthesizes major themes and issues. This review is specifically focused on clinical handovers within the healthcare sector, especially concentrating on literature published in the last five years and covering both quantitative and qualitative research. While the primary source of materials on clinical handover interventions is from within the Medline collection, the review also includes materials in journals outside that collection as well as other published material on the topic, including non-peer-reviewed papers, opinions and published reports.

This review is focused on identifying and analysing available clinical handover literature in relation to five key questions:

1. What are the clinical handover situations that carry the most risk for patients?
2. What are the handover interventions that are most effective?
3. What are the critical success factors and limitations of successful handover interventions?
4. For which handover interventions, is there evidence of sustainability and transferability?
5. What are the gaps in the evidence base on handover?

The approach to the identification and analysis of literature relevant to addressing these questions was guided by the Australian Medical Association (2006) clinical handover definition:

“the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis” (Australian Medical Association: Safe Handover Safe Patients’ Guidelines).

In conducting the review it was acknowledged that this definition is not universally recognised and that there remains a lack of common understanding of the term “clinical handover”. Some research included routine communication interactions between healthcare professionals as part of clinical handover, while other research restricted the term to particular clinical settings. The clinical handover process is also sometimes described by a range of other terms, for example, hand-offs, shift reports, patient transfers.

Following an introduction and description of the methodological approach utilised, this report structures analysis and discussion of literature on clinical handover and the effectiveness and transferability of improvement interventions into three main sections: High Risk Scenarios in Clinical Handover; Interventions, Critical Success Factors and Effectiveness; and, Evidence Gaps in Clinical Handover. In each section, key issues are identified and relevant peer-reviewed literature reviewed and discussed. Each section also contains a summary table including all materials identified as relevant for that section including non-peer reviewed materials, published reports and opinions. To assist in assessing the nature and type of literature reviewed including the strength of evidence and level of transferability, table entries are sorted into one of 5 categories covering the range of literature identified from multi- or single- site evidence-based interventions through pre-intervention studies to published opinions and reports. This literature review concludes with a comprehensive bibliography of all relevant materials identified during the conduct of this literature review.

This literature review highlights that despite the proliferation of published literature on clinical handover in the last 3-5 years, the numbers of high quality evidence based interventions that display a high level of potential for transferability remains relatively low. More positively, there are now a large number of studies that have investigated various aspects of clinical handover and improved understanding of its complex and dynamic nature. These studies clearly confirm **clinical handover is a high risk scenario for patient safety with dangers of discontinuity of care, adverse events and legal claims of malpractice**. Many of the studies focus on clinical handover scenarios involving high acuity patients and/or high acuity environments but only a few

studies address guidelines, protocols or education/training as a response to the challenges identified. Overall this review highlights a growing awareness of the importance of clinical handover initiatives for improving safety and quality. The insights generated from conducting this review suggest that an emerging trend in the near future will be towards increased intervention focused studies based on more structured approaches. It is anticipated that this literature review will make a contribution to this direction and assist in the development of efforts to improve clinical handover into the future. The key themes identified in the 3 major sections of this report are summarised below:

High Risk Scenarios in Clinical Handover:

The **major themes** identified in the literature relating to high risk scenarios in clinical handover can be summarised as follows:

- **Handover risks:** risks identified in the literature linked to seniority/experience of medical staff; nature/type of communication behaviours; quality/content of information recorded and/or exchanged; discontinuity in patient care; lack of standardised protocols; and, health professional fatigue.
- **Inter-profession handover:** risks identified in the literature linked to handover between theatre/post-anaesthesia care; ambulance/emergency department.
- **Inter-departmental handover:** risks identified in the literature linked to handover between emergency department/Intensive care; emergency department/in-patient team; and also where inter-departmental boundaries/responsibilities are unclear.
- **Shift to Shift handover:** risks identified in the literature linked to lack of structure/policy/procedures; role of medical discretion particularly during weekend handover; poor quality of information in emergency department handover; uncertainty over responsibility in an intensive care unit; the importance of the maintenance of core values/relationships in nursing handover; the lack of guidelines for handover of anaesthetised patients; impact of fragmentation of handover amongst mental health nurses; information overload and the dangers of overly long handovers.
- **Hospital to community handover:** risks identified in the literature linked to poor hospital to community discharge processes due to shift to shift handover; poor communication and differences in information quantity/quality depending on a patient's community destination; increased incidence of medical errors and re-hospitalisations.
- **Providing verbal handover only:** risks identified in the literature linked to engaging in verbal handover only highlight the vagaries of human memory and the loss of information across each/every handover.
- **The use of abbreviation in handover:** risks identified in the literature linked to usage by paediatric clinicians of non-standard abbreviations not understood by other health professionals.
- **Patients characteristics affect handover:** risks identified in the literature linked to varying responses by emergency staff to handover information from paramedics depending on patient condition; complex patient problems receiving poorer quality handover than more defined patient conditions; failures in communicating patients mental health status during transfer between hospital and residential aged care.
- **Characteristics of handover:** risks identified in the literature linked to lack of clarity over the effectiveness of verbal, tape recorded or face-to-face handover and how this effectiveness is impacted by different contexts; critical incident analysis highlights communication failures in hospital sign-out amongst interns. Handover is complex and cognitively taxing, in emergency departments interruptions are also a risk for patient safety.

Interventions, Critical Success Factors and Effectiveness:

The **major themes** identified in the literature relating to interventions, critical success factors and effectiveness can be summarised as follows:

- **Minimum data sets and information management:** literature points to improvements in information exchange at handover with examples amongst junior medical officers by using word processors; at weekends through use of a handover sheet; for nurses by standardising information through a minimum data set. Literature also highlights minimum data sets were implemented with electronic tools; at weekends to improve documentation and for enhancing the quality of information transfer. Minimum data sets, discharge checklists, standardised handover cards were also generated and implemented with positive impacts. Communication techniques including minimum data sets such as SBAR and JUMP were also developed. Interestingly a standardised information exchange approach between ambulance staff and emergency department staff did not improve the accuracy of information transferred.
- **Creation of a new role to assist handover:** literature points to improvements in learning outcomes around handover from the creation/training of a peri-operative specialist practitioner.
- **Standard operating protocols (SOPs):** literature points to a range of positive benefits from developing and implementing SOPs including in paediatric surgery to intensive care with improvements in relation to technical errors, information omission and team-work; in accountability transfer and patient care amongst Canadian hospital nurses. Literature also points to comprehensive approaches to the development and evaluation of SOPs.
- **Education and training:** literature points to the positive benefits of appropriate handover education and training. Key elements of how to ensure effective handover are identified and the benefits of improved staff confidence in undertaking handover based on a 1 hour curriculum highlighted. The role and utility of feedback and reflective learning for junior medical officers to support quality improvement are identified.
- **Electronic tools:** literature highlights electronic handover tools including hand-helds having been developed, implemented and evaluated to improve handover. Positive impacts reported were high usage and perceptions of utility amongst junior staff in medicine and surgery; improved information transfer at handover amongst nurses; for shift-to-shift handover by residents; improved continuity of care, reductions in adverse events and reduced time taken for ward rounds. Potential problems of electronic tools are also identified; as well as the utility of user-centred design approaches for optimising patient safety features.
- **Reflective methods:** literature points to the utility of a range of reflective methods for stimulating change in handover practice; improving user perceptions of handover; improving handover outcomes. The range of methods includes personal reflection, appreciative inquiry and reflective dialogue.
- **Change management:** literature points to the positive contribution change management can make to challenges faced in transforming handover where: working hour changes increase the numbers of handovers in a surgical residency; nursing bedside handover is implemented in gynaecology ward; nurses in acute medical ward transformed patient interactions. The change process around the introduction of an electronic handover tool is also examined.
- **Handover types:** literature highlights the benefits of addressing the different types of handover where: nurses move towards clear documentation and non-verbal handover in an elderly care ward; tape recorded interviews improve efficiency of handover communication amongst nurses in a hospice during shift-to-shift handover; SBAR and voice recording improve communication; action research supports the change to nursing bed-side handover; and, bed-side handover leads to better informed nursing staff and positive feedback from patients.

Evidence Gaps in Clinical Handover:

The **major themes** identified in the literature relating to evidence gaps in clinical handover can be summarised as follows:

- **Patients perception and involvement in clinical handover:** literature highlights that the role of patients during handover remains complex and under-researched; Patients

- perceptions in relation to care management and its impact on trust and care satisfaction is identified as an area requiring further investigation.
- **Morning report format:** literature highlights that morning report is not common in Australia and has been under-researched. Literature indicates positive potential for reducing length of stay and increased availability from engaging in morning report based on a single pilot study.
 - **Private hospital settings:** literature on private hospital handover is very limited with only one study identified. This study focused on nursing handover reporting improved overall efficiency and effectiveness from implementing change based on action research principles.
 - **Professional anxiety and handover:** literature on professional anxiety during handover is limited with only one study identified. This study explored the issue in relation to nursing change of shift handover and points to the need for further research.
 - **Frameworks and handover:** literature on holistic frameworks to assist in improving handover is explicitly identified as being required. A few studies in this direction have developed approaches that have been implemented with handovers in general medicine; safety transitions in emergency care; and, socio-technical approaches to developing tools.
 - **Work process mapping and design methods:** literature examining the use of work process mapping to understand handover and to assist with technology design for tools to improve handover remains under-researched. Experimental methods for identifying information and its recall by health professionals are also limited.
 - **Education and training of students:** literature frequently mentions the role of education and training in handover but detailed studies on their structure, implementation or evaluation remain limited.
 - **Inter-hospital and patient transfer:** literature examining inter-hospital transfer is common but investigations of the handover aspects of the transfer are limited. Similarly although literature on patient transfer and retrieval are common, studies examining handover aspects are limited.
 - **Electronic documentation and medical records:** literature explicitly investigating electronic handover documentation and/or links with integration into broader electronic health records systems remains limited.
 - **Legal dimensions:** literature exploring the variety of legal dimensions pertaining to clinical handover continues to remain limited in the health literature.

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1. Introduction

The Australian Commission on Quality and Safety in Health Care (the Commission) has identified clinical handover as one of its top priorities (Priority Area 5) for work in 2007-2008. This priority is in the context of Australia taking a lead role in producing a standard operating protocol for clinical handover as part of its participation in the World Health Organisation's 'High Fives' initiative. The Commission has identified seven projects to form Phase 1 of the National Clinical Handover Initiative. The Commission has also released a tender to involve the private hospital sector and to develop strategies to include electronic clinical handover tools as part of the standardised solution to clinical handovers.

In 2005, the former Australian Council on Safety and Quality in Health Care contracted the Australian Resource Centre for Healthcare Innovations to undertake a comprehensive literature review on clinical handover. This 2005 review was based on 27 papers only due to its strict inclusion criteria, with 8 of the papers focused on non-health industries. Subsequently, there has been a proliferation of improvement work and research into clinical handovers in the healthcare sector. In this context, the Commission contracted the eHealth Services Research group (eHSRG), University of Tasmania to undertake a new literature review. This literature review may inform the development of Phase 2 of the National Clinical Handover Initiative and will provide a general resource for those working on improving or researching clinical handover.

The eHealth Services Research Group (eHSRG), University of Tasmania, has been working together with Royal Hobart Hospital (RHH) for the last few years on a number of projects to improve clinical handover, particularly shift-to-shift clinical handover. These clinical improvement initiatives require a continual identification, review and appraisal of the published peer-reviewed literature and other published materials on research and quality improvement initiatives nationally and internationally. The eHSRG has also established a strong collaborative network with various organisations and institutions that have expertise in research and implementation of clinical handover initiatives both nationally and internationally. Significantly, the existing RHH clinical handover initiative deploys a holistic socio-technical approach to understanding and improving clinical handover. The eHSRG clinical handover team has contributed to the peer-reviewed literature in the field of clinical handover and has highlighted the complexity of the clinical handover process and the need to consider the interaction between people, technology and environment when developing interventions to improve clinical handover.

This document provides a structured evidence based literature review regarding the effectiveness of improvement interventions in clinical handover covering Australian and International published works. The review is presented in a manner that includes summaries of papers, reviews the strength of evidence and synthesizes major themes and issues. This review is specifically focused on clinical handovers within the healthcare sector, especially concentrating on literature published in the last five years and covering both quantitative and qualitative research. While the primary source of materials on clinical handover interventions is from within the Medline collection, the review also includes materials in journals outside that collection as well as other published material on the topic, including non-peer-reviewed papers, opinions and published reports.

This review is focused on identifying and analysing available clinical handover literature in relation to five key questions:

1. What are the clinical handover situations that carry the most risk for patients?
2. What are the handover interventions that are most effective?
3. What are the critical success factors and limitations of successful handover interventions?
4. For which handover interventions, is there evidence of sustainability and transferability?
5. What are the gaps in the evidence base on handover?

Following this introduction, a description of the methodological approach utilised including inclusion/exclusion criteria and the search strategy is provided. The remainder of the report then provides a structured analysis and discussion of literature on clinical handover and the effectiveness/transferability of improvement interventions in three main sections:

1. High Risk Scenarios in Clinical Handover;
2. Interventions, Critical Success Factors and Effectiveness;
3. Evidence Gaps in Clinical Handover.

In each of these three sections, key issues are identified and relevant peer-reviewed literature reviewed and discussed. Each section ends with a summary table including all materials identified and selected as most relevant for that section including non-peer reviewed materials, published reports and opinions. To assist in assessing the nature and type of literature reviewed including the strength of evidence and level of transferability, table entries are sorted into one of 5 categories covering the range of literature identified from multi- or single- site evidence-based interventions through pre-intervention studies to published opinions and reports. This categorisation is described in more detail in the methodology section of this report.

1.1. Background

In approaching the identification and analysis of literature relevant to addressing the questions listed above, the Australian Medical Association (2006) clinical handover definition was a useful guide:

“the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis” (Australian Medical Association: Safe Handover Safe Patients’ Guidelines).

However, in conducting the review it was acknowledged from the outset that this definition is not universally recognised and that as a result one major challenge faced in examining the intervention literature remains the lack of common understanding of the term “clinical handover”. Some research includes routine communication interactions between healthcare professionals as part of clinical handover, while other research restricts the term to particular clinical settings. The clinical handover process is also sometimes described by a range of other terms, for example, hand-offs, shift reports, patient transfers. This review also confirms that good handovers do not happen by chance and that they require the support of significant structural and organisational efforts (AMA, 2006). The literature also highlights the importance of leadership, time commitment, human resource commitment and appropriate structures and processes being in place for effective clinical handover to occur (AMA, 2006). Above all this literature review highlights that clinical handovers involve a complex set of dynamic processes (Yee et al, 2006; Turner et al, 2006; Yonge, 2008) that need to be taken into account in any interventions aimed at improving clinical handover (Wong et al, 2007).

2. Methodology

This section provides information on the approach used in conducting this literature review. It details the approach to scoping the focus of the study including inclusion/exclusion criteria; search terms; the search strategies deployed to identify peer-reviewed publications, non-peer reviewed publications, reports and other materials; the analytical approach and categorisation developed to assist understanding of the nature and type of literature reviewed and the strength of evidence and transferability of results, approaches and insights. The approach utilised in conducting this review draws on the principles of the UK's Quest for Quality and Improved Performance research initiative [www.health.org.uk/QQUIP].

2.1 Scope

In developing the methodological approach for undertaking this review the following inclusion and exclusion criteria were applied:

- Based on the Australian Medical Association (AMA, 2006) definition of handover detailed above, the focus of this review was on identifying research literature, reports and other materials concerned with processes involving the **transfer of information, responsibility and accountability of a patient's care** from one team to another team. More specifically, this review has identified the following key handover scenarios in the literature:
 - Ambulance to Emergency department handover;
 - Inter-departmental transfer (such as Emergency Department to Intensive Care Unit) handover;
 - Shift-to-shift Medical and Nursing handover;
 - Inter-profession handover;
 - Inter-hospital handover;
 - Hospital to Community handover;
- Literature identified as describing clinical communication only, without the transfer of care of patients from one team of healthcare professionals to the other, were generally excluded from this review. In this regard, clinical communication scenarios that were identified but not covered in this review are:
 - General Practice to outpatient clinic referrals,
 - Medication re-conciliation processes,
 - Specific high risk medication communication (e.g. Warfarin) and electronic clinical communication tools including electronic health records, electronic patient records, electronic notification of pathology or radiology results, hospital paging systems, Medical Emergency Team interventions,
 - Communication tools and approaches in case management and chronic disease management.
- Literature published in the form of abstracts, short reports or reviews are included in the comprehensive bibliography but were not formally analysed in the body of the report, except where they offered a new or unique contribution.
- Literature published in languages other than English are not included in this review.
- This review is focused primarily, but not exclusively, on clinical handover literature and other materials published within the last 5 years.

This literature review was conducted in a period of just over 4 weeks throughout April 2008.

2.2 Search Strategy

The search strategy used in undertaking this review aimed to ensure the identification of both:

- Peer-reviewed publications providing quantitative and/or qualitative evidence on the effectiveness of clinical handover improvement interventions and their transferability; and,
- Other peer-reviewed and non-peer reviewed publications, opinions and reports on clinical handover, particularly where these identified high risk handover scenarios, interventions, and critical success factors; and, evidence gaps.

The keywords used in conducting the searches were as follows:

- Handover; Hand-over; Handovers;
- Clinical handover;
- Medical handover;
- Hand-off; "Hand off"; "Hand offs", handoff, handoffs;
- Shift-to-shift communication;
- Inter-shift;
- Shift-to-shift transfer;
- Inter-professional transfer;
- Inter-departmental transfer;
- Inter-hospital transfer;
- Hospital to Community transfer;
- Patient transfer;
- Sign off;
- Sign out.

The formal search strategy targeted a number of potential sources of materials on clinical handover including full text databases; citation databases; web-based search engines and direct analysis of output from known centres of excellence, government agencies and individuals.

- The key databases searched to identify and collect original peer-reviewed publications and reviews on clinical handover were: MEDLINE (PUBMED), OVID, PROQUEST, Cochrane Library, EMBASE and TRIP. Additional publications were identified and collected following citation searching on the multiple databases available through ISI Web of knowledge;
- The key web-based search engine utilised was Google (Scholar). This was backed-up by complementary searches on the following search engines: Altavista, Yahoo!Search and InfoSeek;
- Based on eHSRG knowledge of existing centres of excellence, international, national and state-based government agencies and individuals working in the medical handover domain, searching and direct communication were engaged in to identify any recent publications, reports or opinions.

Results of this search strategy produced a list of **622 indexed resources and 382 web-based resources** comprised of peer-reviewed and non-peer reviewed papers, opinions and reports. Following examination of these materials for suitability (using the exclusion criteria outlined above) **a total of 218 source materials were identified for assessment, categorisation and presentation**. From these materials **a subset of 110 publications** were selected for discussion and presentation within the body of this report. All remaining materials are recorded in the comprehensive bibliography. The selection and categorisation rationale for these core **110** publications is discussed below.

2.3. Assessment, Categorisation and Presentation

The process of assessment, categorisation and selection for presentation from amongst the 218 clinical handover source materials identified by the search strategy was guided by three principle aims:

1. To identify, categorise and assess key materials providing quantitative and/or qualitative evidence on the effectiveness of clinical handover improvement interventions and their transferability;
2. To identify, categorise and assess key materials on clinical handover, particularly those addressing high risk handover scenarios; interventions and critical success factors; and, evidence gaps;
3. To ensure the review was user-friendly and avoided duplication in the identification and presentation of clinical handover issues found amongst the source materials.

All **218** source materials were independently assessed and categorised separately by two members of the eHSRG. The assessment process involved reviewers analysing the clinical setting of the material, the scope/focus of the material, the research methodology (if any), the results/outcomes reported and the implications/insights of the material (particularly in relation to limitations and transferability/sustainability). These materials were categorised into one of five broad categories. **These categories were constructed to enable readers to quickly and easily:** differentiate between different types of intervention based studies; and, also to differentiate intervention based studies from pre-interventional studies, opinions and reports. The five broad categories are as follows:

- **Category 1: Comprehensive intervention based study:** Clear articulation of entire approach to improve clinical handover covering data collection, intervention design, implementation and evaluation and insights into lessons learned. High level of potential transferability.
- **Category 2: Intervention based study:** Approach to clinical handover improvement intervention not comprehensive or limited in depth/clarity in published study. Medium to Low level of potential transferability.
- **Category 3: Pre-intervention study:** Studies variously engaging in data collection, analysis and evaluation to investigate different aspects of clinical handover. Focused on: enhancing understanding, identifying issues/gaps/challenges or the utility of particular research approaches. Some studies provide recommendations for change management, handover improvement interventions or system reform. High to Low level of potential transferability of pre-intervention approaches.
- **Category 4: Published Opinions or Reviews:** Publications not involving any primary research often non-peer-reviewed. Can provide potentially useful insights/perspectives on different aspects of clinical handover including high risk scenarios, evidence gaps, and factors imposing limitations on sustainability/transferability of handover initiatives.
- **Category 5: Published Reports:** Reports produced by Government or non-government agencies, health associations, professional bodies and/or centres of excellence.

Following the independent assessment and categorisation of the 218 source materials, the two reviewers compared their results and agreed upon a selection of 110 materials across all categories to be presented and discussed within the three main sections of this report. This selection process was guided by a number of factors including:

- Ensuring the presentation of key intervention based studies (citation scores and potential for transferability were considered);
- Answering the five Commission identified research questions;
- Providing a representative selection of materials across all five categories;
- Avoiding duplication in the identification and presentation of clinical handover issues found amongst the source materials; and,
- Optimising the utility and usability of this document.

The remainder of this report structures the presentation, analysis and discussion of literature on clinical handover and the effectiveness and transferability of improvement interventions into three main sections:

1. High Risk Scenarios in Clinical Handover; Interventions,
2. Interventions, Critical Success Factors and Effectiveness;
3. Evidence Gaps in Clinical Handover.

In each section, key issues are identified and relevant peer-reviewed literature reviewed and discussed. Each section also contains a summary table that includes all materials identified as relevant for that section including non-peer reviewed materials, published opinions and reports. To assist in assessing the nature and type of literature reviewed including the strength of evidence and level of transferability, table entries are sorted into one of the 5 categories identified above.

The literature review concludes with a comprehensive bibliography of all materials identified and selected during the conduct of this literature review.

3. High risk scenarios in clinical handover

This section presents and discusses the major themes, issues and results identified within the literature pertaining to high risk scenarios in clinical handover. The section begins with a summary of major themes, followed by a presentation of key issues and results reported in the peer-reviewed literature relating to each of these themes. The section ends with a summary table that presents a structured review of all materials selected and categorised as relevant across all themes including non-peer reviewed materials, published opinions and reports.

The **major themes** identified in the literature relating to high risk scenarios in clinical handover can be summarised as follows:

- **Handover risks:** risks identified in the literature linked to seniority/experience of medical staff; nature/type of communication behaviours; quality/content of information recorded and/or exchanged; discontinuity in patient care; lack of standardised protocols; and, health professional fatigue.
- **Inter-profession handover:** risks identified in the literature linked to handover between theatre/post-anaesthesia care; ambulance/emergency department.
- **Inter-departmental handover:** risks identified in the literature linked to handover between emergency department/Intensive care; emergency department/in-patient team; and also where inter-departmental boundaries/responsibilities are unclear.
- **Shift to Shift handover:** risks identified in the literature linked to lack of structure/policy/procedures; role of medical discretion particularly during weekend handover; poor quality of information in emergency department handover; uncertainty over responsibility in an intensive care unit; the importance of the maintenance of core values/relationships in nursing handover; the lack of guidelines for handover of anaesthetised patients; impact of fragmentation of handover amongst mental health nurses; information overload and the dangers of overly long handovers.
- **Hospital to community handover:** risks identified in the literature linked to poor hospital to community discharge processes due to shift to shift handover; poor communication and differences in information quantity/quality depending on a patient's community destination; increased incidence of medical errors and re-hospitalisations.
- **Providing verbal handover only:** risks identified in the literature linked to engaging in verbal handover only highlight the vagaries of human memory and the loss of information across each/every handover.
- **The use of abbreviation in handover:** risks identified in the literature linked to usage by paediatric clinicians of non-standard abbreviations not understood by other health professionals.
- **Patients characteristics affect handover:** risks identified in the literature linked to varying responses by emergency staff to handover information from paramedics depending on patient condition; complex patient problems receiving poorer quality handover than more defined patient conditions; failures in communicating patients mental health status during transfer between hospital and residential aged care.
- **Characteristics of handover:** risks identified in the literature linked to lack of clarity over the effectiveness of verbal, tape recorded or face-to-face handover and how this effectiveness is impacted by different contexts; critical incident analysis highlights communication failures in hospital sign-out amongst interns. Handover is complex and cognitively taxing, in emergency departments interruptions are also a risk for patient safety.

A summary of **key issues and results** reported in the peer-reviewed literature relating to each of these major themes is presented below. Within each theme papers are ordered by date of publication with the most recent at the beginning of each theme.

3.1 Handover risks

- Borowitz et al (2008) used a prospective confidential survey to investigate the effectiveness of the handover process between residents on a paediatric acute care ward in the US. Based on 158 (81%) surveys analysed they found that 31% of residents indicated something happened while on call they were not adequately prepared for. In most cases, residents did not receive information during handover which would have been helpful and most importantly, these instances could have been anticipated. Significantly, the only variable which was found to affect the perception of preparedness for the night shift was the quality of handover received.
- Arora et al (2007) conducted a retrospective cohort study to describe the frequency, types, and harm potential of medication discrepancies in resident-written sign-outs as compared to daily medication lists in patient charts. 186 patients (75%) and 10 (100%) interns consented to participate. From 165 patient charts abstracted and compared: 27% of medication chart entries had discrepancies with sign-outs; 63% of index errors persisted past the first day and 54% of index discrepancies were moderate or severely harmful.
- Singh et al (2007) investigated ten years of USA malpractice claims to examine types and causes of medical errors involving trainee clinicians. From 240 cases 70% involved errors from team-work breakdowns. Lack of supervision and handoff problems were the most prevalent types of teamwork problems, and both were disproportionately more common among errors that involved trainees than those that did not (respectively, 54% vs 7% [$P < .001$] and 20% vs 12% [$P = .0091$]).
- Horwitz et al (2006) used a self-administered survey of 324 US internal medicine residency programs outside of NY State to investigate patient sign-out between resident physicians. Results revealed most centres (55%) did not have a system in place for handover, for informing nurses regarding change of care (59%) and most did not provide any workshops or teaching on handover (60%).
- Sabir et al (2006) conducted a national UK survey of obstetric anaesthetic handovers to record routine practice and perceptions of handover. 168 (70%) anaesthetists responded with 4% (7 incidents) recording critical incidence occurring within the previous 12 month period as a result of poor handover.
- Jagsi et al (2005) conducted a survey of trainees at 2 US teaching hospitals about experiences with adverse events, mistakes and near misses. From 821 (57% response rate) results found that 15% of mistakes were associated with handover.
- Sexton et al (2004) conducted detailed content analysis of 23 nursing handover sessions covering all shifts audio-taped on an Australian hospital general medical ward. Results show only 5.9% of handover content involved discussions related to ongoing care or ward management issues that could not be recorded in an existing documentation source. Some handovers analysed also appeared to promote confusion and often did not clarify issues regarding patient status, treatments or management.
- Roughton and Severs (1996) conducted a survey study in the UK to investigate current junior doctor handover practices and JMOs perspectives and needs. From 60 (51% response rate) returned surveys results found only 17% felt current handover process was good and that written handover was only rarely received (6% of occasions) with (verbal handover on 94% of occasions).
- Peterson et al (1994) used data from a self-reported adverse event system to analyse 3146 patients admitted to a US medical service over a 4-month period and found that there were 54 (44% of total reported and confirmed) potentially preventable adverse events. Significantly patients with potentially avoidable adverse events were more likely to be covered by a physician from another team at the time of the event than the controls (26% compared with 12% [odds ratio, 3.5; $P = 0.01$]).

3.2 Inter-profession handover

- Budd et al (2007) sent a postal questionnaire to 100 emergency departments and 32 ambulance service trusts in England and Wales. Results (based on 34% and 50% responses

rates respectively) found only 26.7% of ambulance service responders acknowledged using a trauma scoring system. Furthermore, while 53.3% of ambulance service responders believe that they used a standardised format, only 39.4% of emergency department responders believed so. This study illustrates the need for improvements in inter-professional handover practices.

- Jenkin et al (2007) conducted a descriptive questionnaire to 4 emergency department and 1 ambulance service in the UK to investigate ambulance to emergency department handover. Results (80 (68%) survey response rate) found that emergency staff lacked active listening skills causing frustration among ambulance staff; ambulance staff must expect to repeat their handovers; and, handovers for critical ill patients should be delivered in two phases.
- Anwari (2002) conducted a survey of nurses on the quality of handover related to the admission of 276 patients from theatre to a post-anaesthesia care unit in Saudi Arabia. Results found that only 42% of patient handovers were rated as good.
- Thakore and Morrison (2001) conducted a descriptive survey using two anonymous questionnaires to medical staff in emergency departments at two Scottish teaching hospitals and one ambulance service. This survey investigated perceptions amongst staff about ambulance to resuscitation room handover. Results (based on 30 medical staff and 67 ambulance staff responses) found that medical and ambulance staff thought the handover practice was good. But 69% of medical staff felt quality of handover varied considerably between ambulance crews. Medical staff were also less positive about handover of patients with self poisoning and chest pain. Both types of staff were also less confident with regard to paediatric emergencies.

3.3 Inter-departmental handover

- Apker et al (2007) conducted in-depth interviews to identify the problems of emergency department to inpatient team handover in a US hospital. Results found that these two professions have very different expectations of handover that often lead to increase risks to patient safety.
- McFetridge et al (2007) used a multi-method design to explore nursing handover of patients from emergency departments to intensive care units in 2 acute care hospitals in Northern Ireland. The results found multiple problems with the handover process including the lack of a structured and consistent approach. This was identified as leading to confusion of individual roles and expectations during the process of handover.
- Bruce and Suserud (2005) conducted a qualitative descriptive study involving interviewing of 6 emergency nurses in an emergency department of a Swedish hospital concerning ambulance to emergency department handover. Results found 3 parts to the handover, verbal, documentation and symbolic. Handover tended to involve very structured verbal communication although depending on the patient condition boundary definition of the roles sometimes was unclear. Also where ambulance staff assumed more responsibility than was expected by the emergency department this caused delays in patient care by delaying accurate diagnosis and management. It should be noted that there was a specific role of ambulance nurse in this study.

3.4 Shift to shift handover

- Alem et al (2008) conducted a two phase study involving a pilot survey and a case study involving an intervention at an Australian metropolitan teaching hospital. The study focused on improving understanding of information sharing at handover and designing and testing information tools to support weekend handover in an emergency department and a general medical ward. Results found that discretion of registrars in handover emerges as a risk; that information tools can have an impact but that any tools need to be designed carefully so as not to weaken complex functions of handover that could lead to poorer patient outcomes.
- Yonge (2008) conducted an exploratory ethnographic study of nursing shift handover in an adolescent residential psychiatric unit in Canada. Results found that verbal, informal shift

reporting allows for an environment that was important for nursing care. The study argues that certain socio-cultural aspects of nursing handover and nursing care are important and involve a 'ritual play' around core values, roles and relationships that are important in supporting good practice.

- Ye et al (2007) conducted a prospective study involving observations and surveys at 3 large Australian metropolitan emergency departments to determine problems, deficiencies and risks from shift to shift handover. Results found in 15.4% of cases, not all required information was provided. Among these cases, 56.9% lead to adverse effects for emergency department doctors and 30.3% to adverse effects on patient care. No adverse medical events were reported.
- Buus (2006) conducted an ethnographic study of mental health nurses regarding their shift to shift handovers on 2 adjacent hospital wards in Denmark. This study revealed three aspects to handover: Informal, non-interactive formal, and interactive formal. The study revealed that the written record did not provide the type of information the nurses needed to present a more formally exact case. This often led to uncertainties that nurses resolved by various strategies. The study suggests nurses face uncertainty regarding actually having accurate and reliable up-to-date knowledge about patients.
- Philpin (2006) conducted an ethnographic study of nursing handover in an intensive therapy unit in the UK. Results found that there was a period of uncertainty (liminality) about the exact handover of responsibility for patient care. The study also noted that informational tools/artefacts, such as a paper towel that nurses used to document preliminary information contained in the chart was disposed subsequently in order maintain some privacy within the profession.
- Sabir et al (2006) [Refer to section 3.1 above] found that while the majority of obstetric anaesthesia units across the UK allocated time for handover, only 10% had a specific handover policy and only 1 unit had a written checklist for handover with 94% of handover being conducted purely verbally.
- Bomba and Prakash (2005) utilised a multi-method approach to investigate medical shift-to-shift handover at an Australian metropolitan hospital. Results found that there was high safety risk resulting from a lack of structure, lack of standard or formal procedure for documentation and communication prone to error. Most medical staff recognised the benefit of formalising and computerising the handover process.
- Horn et al (2004) conducted a postal questionnaire of UK College tutors of anaesthetics and specialist Registrars in the Yorkshire region to evaluate current practice and opinion on handover of anaesthetized patients. Results found that only 14% of departments have guidelines for the handover of anaesthetised patients. The survey also found support for handover of clinical responsibility to be a formal and standardised procedure with appropriate documentation.
- Manias and Street (2000) conducted an ethnographic study of handover amongst 6 nurses in an Australian critical care unit. Results found that nurses involved in bedside handover did not actively participate in global handover conducted by nurse managers. The study also revealed the fear and anxiety experienced by staff during the bedside handover. The study also reported that nurses experiences of being examined as part of the study affected their sensitivity to the need to convey accurate patient information during handover.
- Sherlock (1995) conducted a qualitative investigation into the nature and experience of nursing handover by junior nurses on two medical wards in the UK. The study found that handovers were often long and there was often a sense of information overload. The study also highlighted that the quality of handover was variable and lacked any supporting framework.

3.5 Hospital to community handover

- Atwal (2002) utilised a qualitative case study to investigate nurses' perceptions of hospital discharge processes at a London teaching hospital. The study found that aspects of the discharge process were often ignored or neglected. The ward shift-to-shift handover process often hindered the discharge planning of patients. The study identified significant inter-

professional communication barriers including lack of time, that inhibited/prevented contributions from nurses to the patient discharge planning.

- Anderson and Helms (1998) conducted a retrospective study analysing medical record referrals to compare patient care communication between staff in hospitals: and, nursing homes and home health agencies. Results found that greater amounts of referral data were transferred from hospital to nursing homes than to home health agencies. Some organisational factors in the hospitals and in the information recipients organisation resulted in discrepancies in patient care communication that potentially inhibit continuity of care in the community.

3.6 Providing verbal handover only

- Bhabra et al (2007) utilised a simulated handover to compare the reliability of three handover methods (verbal handover only; verbal with note-taking; and, printed handout containing all patient information). Results highlighted that verbal handover only was a very poor method for handover and without documentation was a high risk strategy. The study found that in the simulated handover the printed sheet supported 99% of information being retained, but recognised this relies on the printed sheet being updated correctly.
- Pothier et al (2005) utilised a simulated handover pilot study to compare the reliability of three handover methods for nursing handover (verbal handover only; verbal with note-taking; and, typed handout containing all patient information). Results highlighted that purely verbal handover led to a complete loss of data after three handover cycles. The note-taking style resulted in 31% of data being transferred correctly after 5 cycles and the typed sheet demonstrated minimal loss of data.

3.7 The use of abbreviation in handover

- Shepherd et al (2008) conducted an audit of abbreviation use in paediatric handover notes and medical notes at a large UK metropolitan hospital to assess frequency, nature and understanding. Results found that only 14-20% of the abbreviations used were recognised in the standard medical dictionary. Most importantly, these abbreviations were not well recognised by other doctors or healthcare professionals.

3.8 Patients characteristics affect handover

- Yong et al (2008) utilised survey methods and observations in an exploratory study of handover from paramedics to emergency staff at an Australian Metropolitan hospital. Results found varying responses amongst emergency department staff to handover from paramedics depending on the patient condition. Only 50% of emergency department staff reported referring to ambulance sheets for patient care.
- Boockvar et al (2005) conducted a retrospective study of hospital and nursing home medical records and inter-facility transfer documents for individuals transferred between 5 long-term and 2 acute care facilities in the US. Results found that 31% of patients did not have mental status handover even though the majority of them were suffering from dementia.
- Bruce and Suserud (2005) [Refer to 3.3 above] found that in ambulance to emergency department nurse handover patients with defined illness received better handover than patients with complex problems, mental health problems or indistinct medical diagnoses complicated by deterioration.

3.9 Characteristics of handover

- Laxmisan et al (2007) conducted an ethnographic study involving analysis of emergency department handover in a US hospital. The study found that interruptions within the emergency department were prevalent and diverse in nature and that there were gaps in information flow due to multi-tasking and shift changes. The communication process is complex and cognitively taxing during and after team handover, that can compromise patient

safety. The study also discusses the need to tailor generic electronic tools to support adaptive processes like multi-tasking and handoffs in time constrained environments.

- Arora et al (2005) conducted interviews using the critical incident technique to handover failures between inpatient physicians in a US hospital. The study interviewed 26 interns and found 25 discrete incidents. The 21 worst events are described. Omitted contents and failure prone communication processes were identified as a major category of failure in communication. These may result in inefficient or sub-optimal care, leading to patient harm.
- O'Connell and Penny (2001) conducted a qualitative grounded theory approach to explore the use of three types of handover techniques commonly used (verbal office handovers, tape recorded handovers and face-to-face bedside handovers) in 5 acute care settings at an Australian teaching hospitals. The study found that each type of handover had its own strengths and weaknesses. The effectiveness of each type of handover remained unclear and no one type was appraised as being more effective. The study recommends taking into account the socio-cultural context of handover and exploring more creative ways to conduct handovers to ensure it fulfils its multiple goals.

3.10 Summary Tables

The tables below present a structured review of all materials selected and categorised as relevant across all themes pertaining to high risk scenarios in clinical handover. The tables also include non-peer reviewed materials, published opinions and reports. The tables present materials from each of the five categories. Within each category table materials are presented by author in alphabetical order. In this section (section 3) it should be noted that no Category 1 papers were identified.

CATEGORY 2 – High Risk Scenarios in Clinical Handover				
Category	Author	Study Type	Outcomes	Comments
2	Alem et al, 2008	<ul style="list-style-type: none"> • Case study, using mixed methodology of quantitative observation and interviews • Shift to shift • Emergency department and general medicine, medical officers 	<p>This paper describes the conduct of a two phase study involving a pilot survey and a case study involving an intervention at an Australian metropolitan teaching hospital.</p> <p>The study focused on improving understanding of information sharing at handover and designing and testing information tools to support weekend handover in an emergency department and a general medical ward.</p> <p>Results found that registrar discretion in handover emerges as a risk; that information tools can have an impact but that any tools need to be designed carefully so as not to weaken complex functions of handover that could lead to poorer patient outcomes.</p> <p>The study highlights the lack of a formalised mechanism to ensure patients are discussed and reliance on the discretion of the doctors making handover of patients after the weekend problematic.</p>	<p>This is a two stage study. The study design makes it somewhat difficult to understand.</p> <p>[Other aspects of this study are examined in section 4 below].</p>

CATEGORY 3 – High Risk Scenarios in Clinical Handover				
Category	Author	Study Type	Outcomes	Comments
3	Anderson and Helms, 1998	<ul style="list-style-type: none"> Quantitative retrospective review of case notes Hospital to nursing home or home health agencies Medical and nursing 	<p>This paper describes the conduct of a retrospective study analysing medical record referrals to compare patient care communication between staff in hospitals; and, nursing homes and home health agencies.</p> <p>Results found that greater amounts of referral data were transferred from hospital to nursing homes than to home health agencies.</p> <p>Some organisational factors in the hospitals and in the information recipients organisation resulted in discrepancies in patient care communication that potentially inhibit continuity of care in the community.</p> <p>The study also highlights that:</p> <p>Hospitals consistently sent data about background information, followed in decreasing order by medical care, nursing care and psychosocial data.</p> <p>Minimal information about psychosocial needs was sent by the hospital.</p> <p>The special care unit transferred more data than the general care unit.</p> <p>Patient-care communication was only slightly improved when a social worker was a member of the care team.</p>	<p>This study demonstrates the challenges and significant risks associated with hospital to community transfer and handover.</p>

3	Anwari, 2002	<ul style="list-style-type: none"> • Quantitative scoring system • Post-operative care • Anaesthetist to post-operative nurse 	<p>This paper describes the conduct of a survey of nurses on the quality of handover related to the admission of 276 patients from theatre to a post-anaesthesia care unit in Saudi Arabia. A quantitative handover scoring system was used to take into account verbal information, patient's condition, anaesthetist behaviour and nurse' satisfaction regarding post-operative patients. It found that with 20% of patients post-operative instructions were either illegible or not written. 14% of anaesthetists failed to give any verbal handover, and only 15% of anaesthetists informed nurses about the course of surgery and any complications.</p> <p>42% of patient handovers were rated as good.</p>	<p>This is an interesting study examining inter-professional handover. Highlights that important information is often not given to post-anaesthesia units. This can inhibit continuity of patient care.</p>
3	Apker et al, 2007	<ul style="list-style-type: none"> • Qualitative • Emergency department to inpatient care teams • Inter-departmental physician handover 	<p>This paper describes the conduct of in-depth interviews to identify the problems of emergency department to inpatient team handover in a US hospital.</p> <p>Results found that these two professions have very different expectations of handover that often lead to increase risks to patient safety. Both emergency physicians and hospitalists consistently identified patient handover as a "gray zone". There were three main problems identified: uncertainty of diagnosis,</p>	<p>This study illustrates that where there is ambiguity of responsibility, transfer patients are at risk. The study also illustrates that different information requirement often leads to discontinuity of patient care.</p>

			<p>lack of clarity of disposition and finally emergency patient boarding (bed-block situation).</p> <p>The main barrier of communication included poor communication practices, such as incomplete information, omitted information and poor information flow between clinicians. This is especially a problem with patients without diagnosis. The second problem is the differing information needs of two professions.</p> <p>Another risk identified was when there were uncertainties regarding the responsibility for patient care.</p>	
3	Arora et al, 2007	<ul style="list-style-type: none"> • Quantitative, retrospective cohort study • Shift to shift handover • Interns for medicine 	<p>This paper describes the conduct of a retrospective cohort study to describe the frequency, types, and harm potential of medication discrepancies in resident-written sign-outs as compared to daily medication lists in patient charts.</p> <p>186 patients (75%) and 10 (100%) interns consented to participate.</p> <p>From 165 patient charts abstracted & compared: 27% of medication chart entries had discrepancies with sign-outs - 80% of which were omission errors.</p> <p>63% of index errors persisted past the first day and 54% of index discrepancies were moderate or severely harmful.</p>	<p>This paper is focused on medication discrepancies but it provides useful insights into the importance of handover in error causation.</p>

3	Arora et al, 2005	<ul style="list-style-type: none"> • Quantitative critical incidents analysis method • Shift to shift • Medical handover 	<p>This paper describes the conduct of interviews using the critical incident technique to analyse sign out failures between inpatient physicians in a US hospital.</p> <p>The study interviewed 26 interns and found 25 discrete incidents.</p> <p>The 21 worst events are described. Omitted contents and failure prone communication processes were identified as a major category of failure in communication.</p> <p>These may result in inefficient or sub-optimal care, leading to patient harm.</p>	<p>This study is important as it points out the issues with handover and suggests some solutions, including systems changes and education programs.</p>
3	Atwal, 2002	<ul style="list-style-type: none"> • Case study method • Medical hospital to community • Nursing discharge planning 	<p>This paper describes a qualitative case study used to investigate nurses' perceptions of hospital discharge processes at a London teaching hospital.</p> <p>The study found that aspects of the discharge process were often ignored or neglected. The ward shift-to-shift handover process often hindered the discharge planning of patients.</p> <p>The study identified significant inter-professional communication barriers including lack of time, that inhibited/prevented contributions from nurses to the patient discharge planning.</p> <p>The study also highlighted that discharge planning skills were not acquired as a student and depended on seniority and experience.</p>	<p>This study identifies hospital to community handover and discharge as problematic due to a lack of culture, education and team work used in addressing the issues/challenges faced at handover.</p>

			Inter-professional working through multi-disciplinary team meetings was problematic.	
3	Bhabra et al, 2007	<ul style="list-style-type: none"> • Quantitative • Simulation environment • Shift to shift 	<p>This paper describes the utilisation of a simulated handover to compare the reliability of three handover methods (verbal handover only; verbal with note-taking; and, printed handout containing all patient information). Results highlighted that verbal handover only was a very poor method for handover and without documentation, was a high risk strategy.</p> <p>The study observed junior doctors conducting five consecutive handover cycles on 12 simulated patients. After 5 cycles, only 2.5% of patient information was retained using verbal-only handover method, 85.5% was retained using verbal with note taking while 99% was retained using a printed handover. The study recognised the reliance on the printed sheet being updated correctly.</p>	<p>In evaluating the results presented it is important to recognise that they are based on a simulated handover. Nonetheless, conclusions point strongly towards verbal-only handover being unreliable and risky.</p>
3	Bomba and Prakash, 2005	<ul style="list-style-type: none"> • Mixed quantitative and qualitative • Shift to shift • Medical doctors 	<p>This paper describes the use of a multi-method approach to investigate medical shift-to-shift handover at an Australian metropolitan hospital. Results found that there was high safety risk resulting from a lack of structure, lack of standard or formal procedure for documentation and</p>	<p>This paper provides a detailed Australian study identifying various problems associated with junior doctors shift to shift handover using a multi-method approach. The study also usefully highlights the potential cost to the healthcare system due to handover problems.</p>

			<p>communication prone to error.</p> <p>Most medical staff recognised the benefit of formalising and computerising the handover process.</p> <p>The study highlighted 95% of respondents believed that no formal or set procedures were available.</p> <p>Most patient information was transferred either verbally or not at all.</p> <p>The negative outcomes identified included increased time, decreased patient care and duplication of orders.</p>	
3	Boockvar et al, 2005	<ul style="list-style-type: none"> • Quantitative review of hospital notes • Inter-facility transfer • Nursing handover notes 	<p>This paper describes the conduct of a retrospective study of hospital and nursing home medical records and inter-facility transfer documents for individuals transferred between 5 long-term and 2 acute care facilities in the US.</p> <p>Results found that 31% of patients did not have mental status handover even though the majority (67%) of them were suffering from dementia.</p> <p>The study also highlighted that several factors were associated with missing description: urgency of transfer, nursing home of origin and level of cognitive impairment in patients without dementia.</p>	This highlights the significant risk at handover for vulnerable patients.
3	Borowitz et al, 2008	<ul style="list-style-type: none"> • Quantitative survey study • Survey was performed 	This paper describes the use of a prospective confidential survey to investigate the effectiveness of the	This is a very important study showing that handover is a major risk to patient care and that handover is

		<p>straight after their night shift</p> <ul style="list-style-type: none"> • Acute paediatric care ward 	<p>handover process between residents on a paediatric acute care ward in the US.</p> <p>Based on 158 (81%) surveys analysed they found that 31% of residents indicated something happened while on call they were not adequately prepared for.</p> <p>In most cases, residents did not receive information during handover which would have been helpful and most importantly, these instances could have been anticipated.</p> <p>Significantly, the only variable which was found to be affect the perception of preparedness for the night shift was the quality of handover received.</p>	<p>important to ensure that incoming teams are prepared for the shift.</p> <p>This provides clear motivation for changes to improve handover.</p>
3	Bruce and Suserud, 2005	<ul style="list-style-type: none"> • Qualitative descriptive, phenomenology design • Ambulance nurse the emergency nurse • Nursing handover 	<p>This paper describes the conduct of a qualitative descriptive study involving interviewing of 6 emergency nurses in an emergency department of a Swedish hospital concerning ambulance to emergency department handover.</p> <p>Results found 3 parts to the handover: verbal, documentation and symbolic.</p> <p>Handover tended to involve very structured verbal communication although depending on the patient condition. Boundary definition of the roles sometimes was unclear.</p> <p>Also where ambulance staff assumed more responsibility than was expected by the emergency department this</p>	<p>The paper presents useful insights regarding inter-profession handover.</p> <p>It is acknowledged that the role of ambulance nurse is not universal. More importantly, it highlights the significant risk at handover for vulnerable patients.</p>

			<p>caused delays in patient care by delaying accurate diagnosis and management.</p> <p>It should be noted that there was a specific role of ambulance nurse in this study.</p> <p>The study also highlighted that the actual symbolic handover took place when the patient was physically transferred. Effective handover requires physical handover of patients accompanied by a verbal account and passing on any written documentation.</p> <p>Some patient characteristics assisted the handover process, such as those with clear, identifiable medical problems with signs of weakness of vital functions, while others impaired the process, such as patients with ambiguous and diffuse problems or those who were perceived as not really in need of advanced care.</p>	
3	Budd et al, 2007	<ul style="list-style-type: none"> • Quantitative survey • Ambulance to hospital • Trauma cases 	<p>This paper describes a postal questionnaire sent to 100 emergency departments and 32 ambulance service trusts in England and Wales.</p> <p>Results (based on 34% and 50% responses rates respectively) found only 26.7% of ambulance service responders acknowledged using a trauma scoring system.</p> <p>Furthermore, while 53.3% of ambulance service responders believed that they used a standardised</p>	<p>This paper highlights how different professions require different information presented in different ways to function effectively.</p> <p>Therefore, inter-professional handover requires the collaboration of these professionals rather than working in information and professional silos.</p>

			<p>format, only 39.4% of emergency department responders believed so. The study illustrated the need for improvements in inter-professional handover practices.</p> <p>The study also highlighted:</p> <p>While all ambulance service responders and 66.7% of hospital responders reported that trauma alerts were indicated on the basis of injury, this information was not always available for the hospital trauma team.</p> <p>There was criticism of information transfer, although 86.7% of ambulance services responders stated that they were familiar with the standard format.</p> <p>Only 9.1% of ambulance personnel provided routine digital photographs, while 75% of hospital responders believed that images would be beneficial.</p>	
3	Buus, 2006	<ul style="list-style-type: none"> • Ethnography • Shift-to-shift • Mental health nurses handover 	<p>This paper describes the conduct of an ethnographic study of mental health nurses regarding their shift to shift handovers on 2 adjacent hospital wards in Denmark.</p> <p>This study revealed three aspects to handover: Informal, non-interactive formal, and interactive formal.</p> <p>The study revealed that the written record did not provide the type of information the nurses needed to present a more formally exact case. This often led to uncertainties that</p>	<p>This study found that the handover description is dependent not only on the format of handover, the present clinical observation, but also on the informal hierarchy and the description based on first-hand knowledge.</p> <p>It is clear that in these circumstances clinical knowledge exchange about patients may not be up-to-date.</p>

			<p>nurses resolved by various strategies.</p> <p>The study suggested uncertainty nurses faced regarding actually having accurate and reliable up-to-date knowledge about patients.</p> <p>The study also highlights:</p> <p>Uncertainties were sometimes resolved by the face saving strategy of expressions of already knowing or having first hand knowledge.</p> <p>Some nurses positioned high in the “hierarchy” would provide answers based on general insight about a patient’s situation and this might influence the decision making process.</p>	
3	Horn et al, 2004	<ul style="list-style-type: none"> • Survey study • Anaesthetist and Anaesthetic Registrars • Peri-operative shift-to-shift handover 	<p>This paper describes the conduct of a postal questionnaire sent to UK College tutors of anaesthetics, and specialist Registrars in the Yorkshire region. The survey was to evaluate current practice and opinion on handover of anaesthetized patients.</p> <p>Results found that only 14% of departments had guidelines for the handover of anaesthetised patients.</p> <p>The survey also found support for handover of clinical responsibility to be a formal and standardised procedure with appropriate documentation.</p> <p>The study also highlighted that: 28% of college tutors and 6% of specialist registrar reported guidelines for handing over patients awaiting</p>	<p>This paper provides very important background understanding of the difficulties faced with the transfer of information, responsibility and accountability of patient care.</p> <p>While agreement on transfer of information has been reached, the transfer of responsibility, from technical and practical point of view is less clear.</p> <p>More importantly, the transfer of accountability, from the perspectives of legal, patient and profession, is even more confused.</p>

			<p>surgery, and this raised the issue about dissemination of guidelines.</p> <p>There was a lack of agreement in regard to accountability, especially if an adverse event happened after handover of the patient.</p> <p>There was a lack of agreement on whether patient should be informed of anticipated transfer of care.</p> <p>The majority of respondents believed that handover of clinical responsibility should be a formal and standardised procedure with appropriate documentation, although only 53% of College tutors and 70% Specialist registrar agreed that defensibility would be enhanced by such a process.</p>	
3	Horwitz et al, 2006	<ul style="list-style-type: none"> • Quantitative survey • 324 accredited US internal medicine residency program • Shift to shift handover 	<p>This paper describes a self-administered survey of 324 US internal medicine residency programs outside of NY State to investigate patient sign-out between resident physicians.</p> <p>Results revealed most centres (55%) did not have a system in place for handover, for informing nurses regarding change of care (59%) and most did not provide any workshops or teaching on handover (60%).</p>	Handover is a significant point of risk for patient care due to the lack of a system or appropriate education and training.
3	Jagsi et al, 2005	<ul style="list-style-type: none"> • Quantitative • Adverse events among trainees 	This paper describes the conduct of a survey of trainees at 2 US teaching hospitals about experiences with adverse events, mistakes and near	Provides insights into the challenges faced by junior medical officers and the link between handover and adverse events, mistakes and near

			misses. From 821(57% response rate) results found that 15% of mistakes were associated with handover.	misses.
3	Jenkin et al, 2007	<ul style="list-style-type: none"> • Quantitative survey • Ambulance to emergency • Patient handover 	<p>This paper describes the conduct of a descriptive questionnaire to 4 emergency department and 1 ambulance service in the UK to investigate ambulance to emergency department handover.</p> <p>Results (80 (68%) survey response rate) found that emergency staff lacked active listening skills causing frustration among ambulance staff.</p> <p>The study found that ambulance officers often had to repeat their handovers or certain aspects of history or treatment.</p> <p>In resuscitation circumstances, ambulance officers often found it difficult to identify the person to handover to.</p> <p>This article also identified five aspects of patients were deemed important in a resuscitation room: reason for attendance, history of events, problems requiring intervention, treatment, significant/relevant medical history.</p>	This provides useful insights into the challenges of inter-profession handover.
3	Laxmisan et al, 2007	<ul style="list-style-type: none"> • Qualitative ethnographic observation and 	This paper describes the conduct of an ethnographic study involving analysis of emergency department handover in	This study provides a very detailed holistic understanding of information flow and work-flow within the

		<p>interviews</p> <ul style="list-style-type: none"> • Shift to shift • Emergency department handover 	<p>a US hospital.</p> <p>The study found that interruptions within the emergency department were prevalent and diverse in nature and that there were gaps in information flow due to multi-tasking and shift changes.</p> <p>The communication process was found to be complex and cognitively taxing during and after team handover, that could compromise patient safety.</p> <p>The study also discussed the need to tailor generic electronic tools to support adaptive processes like multi-tasking and handoffs in time constrained environments.</p>	<p>emergency department setting.</p> <p>The problems of multi-tasking and interruption and the effects on patient care are clearly articulated.</p>
3	Manias and Street, 2000	<ul style="list-style-type: none"> • Critical ethnography • Critical care nursing • Shift to shift handover 	<p>This paper describes the conduct of an ethnographic study of handover amongst 6 nurses in an Australian critical care unit.</p> <p>Results found that nurses involved in bedside handover did not actively participate in global handover conducted by nurse managers.</p> <p>The study also revealed the fear and anxiety experienced by staff during the bedside handover.</p> <p>The study also reported that nurses experiences of being examined as part of the study affected their sensitivity to the need to convey accurate patient information during handover.</p> <p>Global handover seemed to serve the</p>	<p>This study provides important insight into understanding of the impact of standard ritual practices, impacts on handover and nursing performance.</p> <p>Cultures of information sharing need to be re-established to allow open exchange of information without the perception of criticism.</p>

			<p>function of nurse co-ordinator rather than bedside nursing. Nurses tended to discount their own information needs.</p> <p>Nurses tended to identify deficiency of tasks performance, rather than recognising the difficult circumstances.</p>	
3	McFetridge et al, 2007	<ul style="list-style-type: none"> • Multi-method design, with interviews and documentation review • Emergency department to intensive care handover • Nursing handover 	<p>This paper describes the use of a multi-method design to explore nursing handover of patients from emergency departments to intensive care units in 2 acute care hospitals in Northern Ireland.</p> <p>The results found multiple problems with the handover process including the lack of a structured and consistent approach.</p> <p>This was identified as leading to confusion of individual roles and expectations during the process of handover.</p> <p>The study also highlighted that nurses from the two departments differed in their perceptions of when the actual handover began. When patients arrived in intensive care units the ICU nurses were busy settling the patient in leading to emergency department nurses often feeling a loss of control.</p>	<p>This paper reveals the symbolism associated with the physical transfer and care of a patient from one site to the other.</p> <p>It highlights this is considered important and takes priority over acquiring handover information from the previous team.</p>
3	O'Connell and Penny, 2001	<ul style="list-style-type: none"> • Qualitative, interviews, observations, analysed using grounded theory method 	<p>This paper describes the conduct of a qualitative grounded theory approach to explore the use of three types of handover techniques commonly used</p>	<p>This is a very detailed study of all the handover types. It is important that when changes to handover are suggested, one is familiar with the</p>

		<ul style="list-style-type: none"> • Shift to shift • Nursing handover 	<p>(verbal office handovers, tape recorded handovers and face-to-face bedside handovers) in 5 acute care settings at an Australian teaching hospitals.</p> <p>The study found that each type of handover had its own strengths and weaknesses. The effectiveness of each type of handover remained unclear and no one type was appraised as being more effective. The study recommends taking into account the socio-cultural context of handover and exploring more creative ways to conduct handovers to ensure it fulfils its multiple goals.</p>	<p>strengths and weaknesses of each type of handover.</p> <p>The clinical context plays a significant role in determining the best handover type.</p>
3	Petersen et al, 1994	<ul style="list-style-type: none"> • Quantitative • Shift to shift cross coverage • Medical doctors handover 	<p>This paper describes the analysis of data from a self-reported adverse event system covering 3146 patients admitted to a US medical service over a 4-month period.</p> <p>Results found that there were 54 (44% of total reported and confirmed) potentially preventable adverse events.</p> <p>Significantly patients with potentially avoidable adverse events were more likely to be covered by a physician from another team at the time of the event than the control (26% compared with 12% [odds ratio, 3.5; P=0.01]).</p> <p>In multi-variate analysis, three factors were significant and independently correlated with potentially preventable</p>	<p>This study clearly demonstrates that cross coverage of physicians leads to an increase in preventable adverse events.</p>

			adverse events: Cross coverage (odd ratio of 6.1), acute physiology and chronic health evaluation II score (odd ratio per point of 1.2) and history of gastrointestinal bleeding (odd ratio of 4.7).	
3	Philpin, 2006	<ul style="list-style-type: none"> • Ethnography • Intensive care shift to shift bedside handover • Nursing handover 	<p>This paper describes the conduct of an ethnographic study of nursing handover in an intensive therapy unit in the UK.</p> <p>Results found that there was a period of uncertainty (liminality) about the exact handover of responsibility for patient care.</p> <p>The study also noted that informational tools/ artefacts, such as a paper towel that nurses used to document preliminary information contained in the chart was disposed subsequently in order maintain some privacy within the profession.</p> <p>The study also highlighted verbal and non-verbal communications were both used extensively in handover.</p>	This study demonstrates the influence of a culture of ‘scrutiny’ leading to the production of additional unofficial documentation away from official notes/ processes.
3	Pothier et al, 2005	<ul style="list-style-type: none"> • Quantitative, simulated environment • Shift to shift handover • Nursing handover 	<p>This paper describes the use of a simulated handover pilot study to compare the reliability of three handover methods for nursing handover (verbal handover only; verbal with note-taking; and, typed handout containing all patient information).</p> <p>Results highlight that purely verbal</p>	<p>This study highlights the omission and commission errors, especially with verbal and traditional note-taking handovers.</p> <p>It is acknowledged that the study was conducted in a simulated environment.</p>

			<p>handover led to a complete loss of data after three handover cycles. The note-taking style resulted in 31% of data being transferred correctly after 5 cycles and the typed sheet demonstrated minimal loss of data.</p> <p>The simulated handover was of 12 fictional patients, each with 21 data points.</p>	
3	Roughton and Severs, 1996	<ul style="list-style-type: none"> • Quantitative survey • Junior doctors 	<p>This paper describes the conduct of a survey study in the UK to investigate current junior doctor handover practices and JMOs perspectives and needs.</p> <p>From 60 (51% response rate) returned surveys results found only 17% felt the current handover process was good and that written handover were only rarely received (6% of occasions with verbal handover on 94% of occasions).</p> <p>The study also highlighted that the information that should be included, in the order of priority were the: patient's name, ward, problem list, actions needed list, age, resuscitation status and hospital number.</p>	<p>This paper is included because it was one of the early papers that looked at handover from a junior doctor's perspective.</p> <p>The study however, does not clearly define what constitutes handover.</p>
3	Sabir et al, 2006	<ul style="list-style-type: none"> • Quantitative survey • Shift to shift • Obstetric anaesthesia, medical 	<p>This paper describes the conduct of a national UK survey of obstetric anaesthetic handovers to record routine practice and perceptions of handover.</p> <p>168 (70%) anaesthetists responded with 4% (7 incidents) recording critical</p>	<p>This paper provides a national wide study with a good response rate. All the data were self-reported.</p> <p>The strength of evidence would have been enhanced by comparing self-reporting to other data sources, such</p>

			<p>incidence occurring within the previous 12 month period as a result of poor handover.</p> <p>The study also identified that:</p> <p>79% of units have an allocated time for handover.</p> <p>76% (a majority) of handovers were reported as being completed in < 15 minutes.</p> <p>94% of handovers were conducted purely verbally.</p> <p>Most handovers were conducted within the labour ward, although many patients were not visited by the new team once handed over.</p> <p>10% of units have specific handover policies and only 1 unit has a written checklist.</p>	<p>as incident reporting systems.</p>
3	Sexton et al, 2004	<ul style="list-style-type: none"> • Content analysis • Shift to shift, general medical ward • Nursing handover 	<p>This paper describes the conduct of a detailed content analysis of 23 nursing handover sessions covering all shifts audio-taped on an Australian hospital general medical ward.</p> <p>Results show only 5.9% of handover content involved discussions related to ongoing care or ward management issues that could not be recorded in an existing documentation source.</p> <p>Some handovers analysed also appeared to promote confusion and often did not clarify issues regarding patient status, treatments or management.</p>	<p>This study found that the current handover practice did not provide useful information transfer for patient care.</p>

3	Sheppard et al, 2008	<ul style="list-style-type: none"> • Quantitative • Paediatric medical practitioners • Shift-to-shift handover 	<p>This paper describes the conduct of an audit of abbreviation use in paediatric handover notes and medical notes at a large UK metropolitan hospital to assess frequency, nature and understanding.</p> <p>Results found that only 14-20% of the abbreviations used were recognised in the standard medical dictionary.</p> <p>Most importantly, these abbreviations were not well recognised by other doctors or healthcare professionals</p> <p>The study analysis revealed 2286 abbreviations were used on 25 handover sheets.</p> <p>Some words/phrases had multiple different abbreviations.</p> <p>Some abbreviations could have multiple meanings.</p> <p>Paediatric doctors recognised 56-94% of abbreviations while other healthcare professionals recognised 31-63% of abbreviations.</p>	<p>This study highlights the need for handovers to be conducted using terms that are commonly understood and recognised by all involved in delivering continuity of care.</p> <p>Failure in communication poses a high risk for handover and patient care outcomes.</p>
3	Sherlock, 1995	<ul style="list-style-type: none"> • Qualitative participant observation • Shift to shift • Nursing handover 	<p>This paper describes the conduct of a qualitative investigation into the nature and experience of nursing handover by junior nurses on two medical wards in the UK.</p> <p>The study found that handovers were often long and there was often a sense of information overload.</p> <p>The study also highlighted that the quality of handover was variable and</p>	<p>Provides useful insights into nurse experience and confusion arising from handover. It highlights the risks for continuity of care arising from poor handover and/or information overload.</p>

			lacked any supporting framework.	
3	Singh et al, 2007	<ul style="list-style-type: none"> • Quantitative • Insurance claim analysis • 1984-2004 (20 years analysis) 	<p>This paper describes an investigation and analysis of ten years of USA malpractice claims to examine types and causes of medical errors involving trainee clinicians.</p> <p>From 240 cases 70% involved errors from team-work breakdowns.</p> <p>Lack of supervision and handoff problems were the most prevalent types of teamwork problems, and both were disproportionately more common among errors that involved trainees than those that did not (respectively, 54% vs 7% [P<.001] and 20% vs 12% [P=.0091].</p> <p>The study also recorded that 19% of malpractice claims involving trainee and 13% of malpractice claim involving non-trainee were related to handover problems.</p> <p>For those involving trainee, 34% were due to trainee to trainee handover, 32% due to trainee to attending physician handover, 14% due to trainee to nurses handover, the others were due to trainee to other healthcare professional handovers.</p> <p>In general, the handover communication problems were complex and involved multiple breakdowns in communication.</p>	<p>This paper provides very important insights and highlights that the risk to patient safety from handover is significant.</p> <p>The highest risk also appears to be trainee-to-trainee handover.</p>

3	Thakore and Morrison, 2001	<ul style="list-style-type: none"> • Quantitative • Emergency department and ambulance staff perceptions • Inter-profession handover 	<p>This paper describes the conduct of a descriptive survey using two anonymous questionnaires to medical staff in emergency departments at two Scottish teaching hospitals and one ambulance service.</p> <p>This survey investigated perceptions amongst staff about ambulance to resuscitation room handover.</p> <p>Results (based on 30 medical staff and 67 ambulance staff responses) found that medical and ambulance staff thought the handover practice was good.</p> <p>But 69% of medical staff felt quality of handover varied considerably between ambulance crews.</p> <p>Medical staff were also less positive about handover of patients with self poisoning and chest pain. Both types of staff were also less confident with regard to paediatric emergencies.</p>	<p>This paper provides useful insights into the perceptions and challenges faced in inter-profession handover.</p>
3	Ye et al, 2007	<ul style="list-style-type: none"> • Quantitative (observation, survey and recording) • Shift to shift • Emergency department medical doctors 	<p>This paper describes the conduct of a prospective study involving observations and surveys at 3 large Australian metropolitan emergency departments to determine problems, deficiencies and risks from shift to shift handover.</p> <p>Results found in 15.4% of cases, not all required information was provided.</p> <p>Among these cases, 56.9% lead to adverse effects for emergency department doctors, and 30.3% to</p>	<p>The paper appears to suggest that a direct measure of handover effects on patient outcomes is difficult to carry out, given that inadequate information does not necessarily lead to adverse outcomes.</p> <p>While the study advocates a move towards a 'gold standard for handover, it is not clear from the paper how this could be derived.</p>

			<p>adverse effects on patient care.</p> <p>No adverse medical events as a result of insufficient handover information were reported.</p> <p>The study also highlighted approximately 5% of handovers were rated as poor or very poor.</p> <p>The main adverse effects were repetition of assessment and delays in management.</p> <p>Other problematic areas included communication with patients, relatives, other healthcare teams and general practitioners.</p> <p>Management, predisposition, follow up, examination findings and investigation findings were also frequently reported as problematic.</p>	
3	Yong et al, 2008	<ul style="list-style-type: none"> • Quantitative study • Inter-professional • Ambulance to emergency department 	<p>This paper describes the use of survey methods and observations in an exploratory study of handover from paramedics to emergency staff at an Australian Metropolitan hospital.</p> <p>Results found varying responses amongst emergency department staff to handover from paramedics depending on the patient condition.</p> <p>Only 50% of emergency department staff reported referring to ambulance sheets for patient care.</p> <p>The study also highlighted that:</p> <p>Paramedics had to handover twice in 91% of cases and 3 times for 3% of</p>	<p>This paper presents a single site study.</p> <p>It does however illustrate the difficulties of inter-professional handover as well as the influence of certain presenting problems on handover behaviours.</p>

			<p>patients.</p> <p>Doctors were more likely to be present at category 1 or 2 handovers.</p> <p>Certain patient conditions, including altered consciousness, chest pain, substance intoxication, trauma were thought to have more useful and relevant handover information, compared to behaviour-related presentations.</p>	
3	Yonge, 2008	<ul style="list-style-type: none"> • Ethnography • Residential adolescent psychiatric unit • Shift to shift multi-disciplinary handover (nurses, therapists and students) 	<p>This paper describes the conduct of an exploratory ethnographic study of nursing shift handover in an adolescent residential psychiatric unit in Canada.</p> <p>Results found that verbal, informal shift reporting allowed for an environment that was important for nursing care. The study argued that certain socio-cultural aspects of nursing handover and nursing care were important and involved a 'ritual play' around core values, roles and relationships that were important in supporting good practice.</p> <p>The study also found that certain descriptions were used in order to vent frustration rather than to stereotype patients.</p> <p>While discussions were useful, interruptions with no apparent link to the actual case being handed over was seen as disruptive.</p>	<p>This study highlights the importance of socio-cultural context in handover. This has implications for any interventions making changes to handover.</p> <p>It is important not to discard or ignore important social functions of handover when implementing new procedures.</p>

CATEGORY 4 – High Risk Scenarios in Clinical Handover			
Category	Name	Type: Opinions and Reviews	Commentary
4	Dracup and Morris, 2008	Editorial theme: Handover Risk	Handover is a high risk scenario, especially in intensive care units. There is, however, a lack of education programs within the undergraduate medical and nursing curriculum to address shift to shift handover.
4	Gandhi, 2005	Opinion and case review themes: Handover Risk, Hospital to Community	Communication breakdowns and missed follow-up of test results. Presentation of a US hospital case of failed diagnosis of tuberculosis. Highlights the importance of good information handover and communication.
4	Shojania, 2006	Opinion and case review themes: Handover Risk, Shift to Shift Handover	Impact of teaching hospital handover leading to patient death. The lack of documentation and the lack of proper shift to shift handover process have contributed to the problems leading to this adverse event.

CATEGORY 5 – High Risk Scenarios in Clinical Handover			
Category	Name	Type: Report	Commentary
5	Australian Council for Safety and Quality in Health Care, 2005	Clinical handover and patient safety: Literature review report	<p>This literature review, conducted by the Australian Resource Centre for Healthcare Innovation (ARCHI) aims to identify factors relating to clinical handover that are associated with patient safety; the effectiveness of a safety culture within non-health industries and the quality of evidence and gaps in research.</p> <p>Specific remarks on high risk scenarios:</p> <ul style="list-style-type: none"> • Ineffective handover can lead to wrong treatments, delays in diagnosis, adverse events, patient complaints, increased healthcare expenditure and increased length of hospital stay amongst others. • The lack of systems, training and handover protocols may increase incidents and adversely affect patient safety. • A lack of communication between specialist services to inpatient systems contributes to risks. • Absconding in psychiatric hospitals is more likely to occur during handover times. • Poor communication, including missing details impact on patient outcomes.
5	Australian Medical Association (AMA), 2006	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover and provides examples of good models of handover from which doctors and hospital managers can learn from. It emphasizes continuity of information, the need for organisational change, care planning and prioritization of tasks and recognises range of handover types.</p> <p>Specific remarks on high risk scenarios:</p> <ul style="list-style-type: none"> • General trend of reduction in working hours resulting in a need for better handover. • Handovers are not well taught and well practiced, with 95% of doctors reporting the lack of standard procedures for handover. <p>Highlights a coroner’s case which demonstrates the risks of poor handover.</p>

5	British Medical Association (BMA) and National Health Service (NHS), 2004	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover. It provides examples of good handover and aims to derive further developments in standardising handover arrangements in hospitals in the United Kingdom.</p> <p>Specific remarks on high risk scenarios:</p> <ul style="list-style-type: none"> • Summarises the European Working Time Directive and the impact on continuity of patient care. • Provides an overview of the benefits of handover to patients and doctors. • Provides some examples of communication and handover problems which might lead to adverse events through critical incident reviews.
5	Royal College of Surgeons of England, 2007	Safe handover: Guidance from the working time directive working party	<p>This is the report from the Royal College of Surgeons of England regarding safe handover.</p> <p>Specific remarks on high risk scenarios:</p> <ul style="list-style-type: none"> • Overload of information might affect patient care. • Complex care requirements often create problems. • Combination of emergency and elective surgery workloads is high risk.
5	World Health Organisation (WHO) and Joint Commission International Centre for Patient Safety, 2008	Patient safety solution 3: Communication during patient handovers	<p>This is a joint report by the World Health Organisation and the Joint Commission International Centre for Patient Safety. It describes Patient safety solution 3: Communication during patient handovers.</p> <p>Specific remarks on high risk scenarios:</p> <ul style="list-style-type: none"> • Breakdown in communication is a major cause of adverse events and handover problems are of international concern. • The lack of team training and communication training for healthcare professionals contributes to the problem. • Language issues may contribute to communication problems during handover.

			<ul style="list-style-type: none">• Lack of patient and family involvement is a significant risk.• Systems which promote individual autonomy and individual performance can be a significant contributor.
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4. Interventions, critical success factors and effectiveness

This section presents and discusses the major themes, issues and results identified within the literature pertaining to interventions, critical success factors and effectiveness. The section begins with a summary of major themes, followed by a presentation of key issues and results reported in the peer-reviewed literature relating to each of these themes. The section ends with a summary table that presents a structured review of all materials selected and categorised as relevant including non-peer reviewed materials, published opinions and reports.

The **major themes** identified in the literature relating to interventions, critical success factors and effectiveness can be summarised as follows:

- **Minimum data sets and information management:** literature points to improvements in information exchange at handover with examples amongst junior medical officers by using word processors; at weekends through use of a handover sheet; for nurses by standardising information through a minimum data set. Literature also highlights minimum data sets were implemented with electronic tools; at weekends to improve documentation and for enhancing the quality of information transfer. Minimum data sets, discharge checklists, standardised handover cards were also generated and implemented with positive impacts, as was the SBAR technique. The JUMP technique was also developed for shift to shift medical handover. Interestingly a standardised information exchange approach between ambulance staff and emergency department staff did not improve the accuracy of information transferred.
- **Creation of a new role to assist handover:** literature points to improvements in learning outcomes around handover from the creation/training of a peri-operative specialist practitioner.
- **Standard operating protocols (SOPs):** literature points to a range of positive benefits from developing and implementing SOPs including in paediatric surgery to intensive care with improvements in relation to technical errors, information omission and team-work; in accountability transfer and patient care amongst Canadian hospital nurses. Literature also points to comprehensive approaches to the development and evaluation of SOPs.
- **Education and Training:** literature points to the positive benefits of appropriate handover education and training. Key elements of how to ensure effective handover are identified and the benefits of improved staff confidence in undertaking handover based on a 1 hour curriculum highlighted. The role and utility of feedback and reflective learning for junior medical officers to support quality improvement are identified.
- **Electronic Tools:** literature highlights electronic handover tools including hand-helds having been developed, implemented and evaluated to improve handover. Positive impacts reported were high usage and perceptions of utility amongst junior staff in medicine and surgery; improved information transfer at handover amongst nurses; for shift-to-shift handover by residents; improved continuity of care, reductions in adverse events and reduced time taken for ward rounds. Potential problems of electronic tools are also identified; and, the utility of user-centred design approaches for optimising patient safety features.
- **Reflective Methods:** literature points to the utility of a range of reflective methods for stimulating change in handover practice; improving user perceptions of handover; improving handover outcomes. The range of methods includes personal reflection, appreciative inquiry and reflective dialogue.
- **Change Management:** literature points to the positive contribution change management can make to challenges faced in transforming handover where: working hour changes increase the numbers of handovers in a surgical residency; nursing bedside handover is implemented in gynaecology ward; nurses in acute medical ward transformed patient interactions. The change process around the introduction of an electronic handover tool is also examined.
- **Handover types:** literature highlights the benefits of addressing the different types of handover where: nurses move towards clear documentation and non-verbal handover in

an elderly care ward; tape recorded interviews improve efficiency of handover communication amongst nurses in a hospice during shift-to-shift handover; SBAR and voice recording improve communication; action research supports the change to nursing bed-side handover; and, bed-side handover leads to better informed nursing staff and positive feedback from patients.

A summary of **key issues and results** reported in the peer-reviewed literature relating to each of these major themes is presented below.

4.1 Minimum Data sets and information management

- Alem et al (2008) [Refer to section 3.4 above]. conducted a two phase study involving a pilot survey and a case study involving an intervention at an Australian metropolitan teaching hospital. A weekend handover sheet/information tool was implemented, and analysis revealed that the likelihood of a patient being discussed in a handover after having being discussed at a previous handover improved after the implementation of the information tools.
- Wong et al (2008) present details of the minimum data set for developed for clinical handover messages at an Australian hospital. The paper reports on the benefits for improving information transfer of patient care.
- Mikos (2007) reports on the use of the SBAR technique in combination with phone recordings of nursing handover at a US hospital medical centre. The paper reports improvements in patient safety and quality of care since the implementation of the system. Other benefits reported include a streamlined handoff process, reduced patient falls during shift change, increased response times to patient call lights and reduced reporting time by 70%.
- McCann et al (2007) describes a study conducted in New Zealand that found handovers among nurses were better perceived than those among junior medical officers. The paper describes the development of the 'JUMP' minimum data set for shift to shift medical handover.
- Talbot and Bleetman (2007) describe the development, implementation and evaluation of a standardised method for verbal communication between ambulance officers and emergency department staff in two large UK hospitals. Evaluation conducted found that information retention did not improve as a result of this intervention.
- Wilson (2007) presents the design and development of a minimum data set for inclusion in a nursing handover report template and the implementation of this template in to 5 units within a US hospital. The study evaluated the use of this template and found that it was useful for junior staff, improved information transfer but met with some resistance from senior nurses who felt their handover to already be good.
- Wong et al (2007) describe the development and implementation of a minimum data set within an electronic handover tool incorporating a number of patient safety features at an Australian hospital.
- Fenton (2006) describes the development of a handover guide incorporating minimum data sets to assist standardisation of handover drawing on the essence of care' as a guide. Evaluation conducted reports improved information transfer after the implementation of the minimum data set.
- Halasyamani et al (2006) reports on the development and outcome of process to produce a comprehensive checklist of processes and elements considered necessary for optimal patient (particularly the elderly) handoff at hospital discharge. The paper does not present information on the implementation or evaluation of this discharge checklist.
- Cheah et al (2005) describes the development of a minimum data set and its incorporation into an existing electronic system at an Australian hospital. The paper reports on results of a survey of doctors on the adequacy of the handover system and the use of free-text fields.
- Grainge et al (2005) reports on the outcomes of using a weekend standardised minimum data set for handover among medical doctors at a UK Hospital. The results of the study found improvement in the documentation including a weekend plan and resuscitation decisions. User feedback recorded found the minimum data set form to be straightforward and user friendly.

- Harrison et al (2005) designed, implemented and evaluated the use of a simple handover list using a word processor package containing information on tasks and priorities to be performed on patients at a hospital in the UK. The paper reports improved flow of information for junior clinicians.
- Currie (2002) presents the use of a questionnaire method to generate six areas of priority for emergency department nursing handover at a UK hospital. Based on data analysis the paper recommends the 'CUBAN' five step handover guideline to improve quality. CUBAN is not evaluated in this paper.
- Lee et al (1996) describe the use of a standardised handover card within a prospective randomised controlled trial amongst interns at a Mayo Clinic in the US. The paper reports significant improvement in the quality of handover amongst the active arm as compared to the control.
- Patterson et al (1995) describes the use of a consensus quantitative survey method to derive minimum data set across different disciplines of nursing staff at a large US hospital. The paper does not present information on the implementation or evaluation of this minimum data set.

4.2 Creation of a new role to assist handover

- Nestel et al (2005) reports on the creation of a new role to assist handover at a UK hospital. The new role, the peri-operative specialist practitioner delivers care at either side of the operative period and routinely transmits patient information to consultant surgeons and anaesthetists. The paper also reports on a training programme on handover presentation skills developed around this role using adult learning theory. The paper reports the program successively achieved the goals of learning outcomes for staff fulfilling the new role.

4.3 Standard Operating Protocols (SOPs)

- Catchpole et al (2007) uses formula 1 pit-stop and aviation training models to report on the development of a new clinical handover standardised operating protocol for paediatric surgery to paediatric intensive care unit handover in a UK hospital. The paper presents findings showing significant improvements in technical errors, information omissions and team work.
- Alvarado et al (2006) describes the development, pilot implementation and evaluation of evidence based transfer of accountability guidelines and a bed-side patient safety checklist for nurses at a Canadian hospital. The evaluation reports improvements in patient care.
- Arora and Johnson (2006) report on an interactive workshop hand-off clinic for developing a standardised process for hand-off, creating a checklist of critical patient content, and plan for dissemination and training. Implementation of this model and evaluation of this process are clearly demonstrated and discussed.
- Benson et al (2007) present a detailed standardised operating protocol for nurses based on a literature review, quantitative survey and discussion forums. Developed in Canada the protocol includes multiple steps including principles of handover, guidelines, documentation tools, educational strategies, evaluation and project completion.
- Singer and Dean (2006) present a review of the effectiveness and efficiencies of emergency department inter-shift handovers and recommendations for parameters for pre-handover, inter-shift meeting, and post-handover activities.
- Bourne (2000) describes the development and presentation of a standardised operating protocol for nursing handover. This UK paper provides an overview of standard statements on handovers and on handover standard monitoring tools. The paper does not present any results of the implementation of the protocol presented.

4.4 Education and Training

- Horwitz et al (2007) presents the development of a 1 hour curriculum program to improve verbal sign out skills of medical house staff. The paper describes the implementation of the

program curriculum at 3 US hospitals. The paper also presents results of the program's evaluation revealing significant improvement in confidence of participants.

- Yee et al (2006) describes a research-in-progress paper outlining the provision of education and training through feedback and reflective learning for junior medical officers on clinical at an Australian hospital. The paper argues that systemic changes may not be adequate and that provision of training and incentives to engage junior doctors in clinical handover improvement are essential to ensure quality improvement. The role and utility of these approaches are presented.
- Hoban (2003) presents a concise summary of a five step communication model to enhance nursing handover whether face-to-face, written or recorded.

4.5 Electronic Tools

- McGee-Lennon et al (2007) describes the implementation of a handheld computer system for nursing handover within three Scottish hospitals emergency care teams. The paper also reports on evaluation of how the system was used and accepted by nurses. The paper describes positively rated features of the tool including generation of a printed handover sheet.
- Wong et al (2007) describes a methodological approach deploying user-centred design principles to develop an electronic clinical handover support tool. The paper emphasises the role that incorporating six patient safety features into the electronic handover tool had in improving junior medical officer acceptance and use of the tool at an Australian hospital.
- Chacko et al (2006) describes a electronic handover tool 'eHand-offs' produced by IBM, Lotus and Domino designed for electronic patient sign outs at US hospitals. The paper claims that the tool helps improve continuity of care, reduce medical errors and improve resident supervision and training.
- Morrison (2006) presents details of the development and implementation of the iHandover junior doctor electronic clinical handover system at an Australia hospital. A one year evaluation of the implemented system found that 66% of respondents perceived that the new system supported improved handover.
- Turner et al (2006) presents unique insights into the potential problems of information technology in clinical handover. The paper describes the utilisation of a mixed methodology in an Australian hospital setting. Results highlight that clinical handovers serve multiple different functions affected by a range of factors and inter-relationships amongst those factors. The study highlights clinicians being sceptical of the value of electronic handover tools and displaying resistance to change.
- Cheah et al (2005) [refer to section 4.1 above] describes the development of a minimum data set and its incorporation into an existing electronic system at an Australian hospital. The paper reports on results of a survey of doctors on the adequacy of the handover system and the use of free-text fields which indicates the electronic system was useful and well utilised by junior staff in medicine and surgery.
- Morris and Baker (2005) describe the development of a handover module within an existing multi-hospital clinical information system in Australia. The paper presents the development and pilot study design/implementation of the existing information system to incorporate clinical handover.
- van Eaton et al (2005) conducted a prospective, randomised, cross-over 5 month study to evaluate the effect of computerised handover system on continuity of patient care amongst 14 inpatient resident teams. The results found that the computerised system improved patient care and reduced time taken for ward rounds.
- van Eaton et al (2004) presents a multi-step method to design and implement an electronic system to improve shift-to-shift handover among residents at two US teaching hospitals. The electronic handover system consisted of automatic data retrieval from the existing clinical information system and from data entry by residents. The system was widely utilised and adapted by residents for handover. The paper does not present results of any evaluation of the impact of the system on patient care.

- Petersen et al (1998) report on the evaluation of a 4 month computerised handover program intervention to improve continuity of care. The study found that the computerised system reduced adverse events related to cross-coverage, although the number of events was small and statistical significance was difficult to demonstrate.

4.6 Reflective methods

- Broekhuis and Veldkamp (2007) describe the use and feasibility of the reflectivity method for stimulating learning and change amongst doctors at a hospital in the Netherlands. The method has several stages and is reported as being useful in affecting positive change in clinical handover structure, rules, protocols and 'atmosphere'.
- Shendell-Falik et al (2007) describes the use of the appreciative inquiry 5-D Cycle change framework to improve nursing handover from an emergency department to a telemetry unit in a US hospital. The paper reports improved outcomes and presents inpatient handoff scripts and a standardized transfer form.
- Davies and Priestley (2006) present a study into the use of a personal reflection method in combination with literature review to derive a care sheet for nursing handover in a UK hospital. User evaluation of the care sheet implementation reports staff commitment and support, perceived reduction in handover duration and increased efficiency.

4.7 Change management

- Wong et al (2007) [Refer to section 4.1. above] describes the change process around designing and implementing an electronic clinical handover tool to support clinical handover in an Australian hospital. The paper emphasises the approach to engaging clinicians early and involving clinicians in the every step of the project design, development, implementation and on-going evaluation in an iterative feedback loop. This study stresses the need to include both proponents and opponents of new changes around electronic handover support tools. A framework and strategy for sustainable engagement is provided.
- Kellogg et al (2006) describes the changes from long-shift to shorter shift in surgical residency in a US hospital. Deploying ethnographic methods over a 15 month period the paper studies reveals resistance to change on handover resulting from work hour restrictions and highlights how resistance can be addressed to improve handover.
- Kassean and Jagoo, (2005) conducted a study to implement bed-side nursing handover to allow patient participation on a gynaecological ward at a hospital in Mauritius. The approach outlined adapted Spradley's 8-step model and Lewin's 3-step model of unfreezing, moving and refreezing as a change management framework. The paper reports the change management process was successfully implemented to the satisfaction of patients and staff.
- Kelly (2005) describes the change of handover from office-based to walk-around, bedside based handover in a 12-bed rehabilitation ward. Four months after the trial, an evaluation survey found that nurses thought that they were better informed of patient's care. Evaluation from the perspective of patients indicated that they were more involved in their own care because of the new handover system.
- Williams (1998) describes how nurses on an acute medical ward in a UK hospital changed the way patient information was shared between patients and nurses. Following 4 months, a survey questionnaire recorded perceptions of improved consistency and continuity of patient care.
- Watkins (1997) provides a thorough review of change management and change strategy as well as a narrative description of the introduction of nursing bedside handover at a UK hospital. The evaluation was informal and demonstrated most patients welcomed the bedside handover and staff reported increased job satisfaction.

4.8 Handover types

- Mikos (2007) [Refer to section 4.1 above] reports on the use of the SBAR technique in combination with phone recordings of nursing handover at a US hospital medical centre. The paper reports improvements in patient safety and quality of care since the implementation of

the system. Other benefits reported include a streamlined handoff process, reduced patient falls during shift change, increased response times to patient call lights and reduced reporting time by 70%.

- Anderson and Mangino (2006) describes in detail a change management strategy for implementing bedside handover for nurses in a US medical centre. This study also evaluated the program and produced results showing significant positive perceptions from patients and staff alike.
- Kennedy (1999) reports on a project to improve nursing handover at a UK hospital by promoting the use of clear documentation and non-verbal nursing handovers. The study reports on findings that show improved documentation of handover provides stronger continuity of care.
- Webster (1999) reports on the use of an action research methodology to improve handover from traditional office based handover to bedside handover amongst nurses at a UK hospital. The study was undertaken on a medical ward for people over 65 years old and aimed to identify whether after 6 months of bed-side handover staff felt issues previously identified had been addressed. Results point to improved interaction/satisfaction amongst both patients and staff.
- Prouse (1995) describes a pilot study using tape-recorded nursing handovers at a Community Hospice in the UK. The paper reports on resulting improvements in financial, reporting and time efficiency of handover.

4.9 Summary Tables

The tables below present a structured review of all materials selected and categorised as relevant across all themes pertaining to interventions, critical success factors and effectiveness of clinical handover. The tables also include non-peer reviewed materials, published opinions and reports. The tables present materials from each of the five categories. Within each category table materials are presented by author in alphabetical order.

CATEGORY 1 – Interventions, Critical Success Factors and Effectiveness

Category	Author	Study Type	Intervention and/or Approach	Outcomes and/or Recommendations	Comments
1	Anderson and Mangino, 2006	<ul style="list-style-type: none"> • Quantitative evaluation • Shift to shift • Nursing handover 	Bedside handover Detail change management methodology	<p>Paper describes in detail a change management strategy for implementing bedside handover for nurses in a US medical centre.</p> <p>This study also evaluated the program and produced results showing significant positive perceptions from patients and staff alike.</p> <p>The paper described in detail the 7 steps implementation process for bedside handover: building a team, identifying goals and outcomes, making implementation a priority, gathering baseline data, educating the team, providing resources, celebrations and feedback.</p> <p>The study found that bedside handover reduced the amount of overtime and therefore had significant financial benefits.</p> <p>Nurses reported better understanding of patient care and physicians reported better satisfaction.</p> <p>Bedside handover increased satisfaction rating from patients, especially from the perspective of information provision, team work</p>	This is a well designed study that demonstrates many positive outcomes from effective bedside handover.

				environment and involvement in decision making.	
1	Catchpole et al, 2007	<ul style="list-style-type: none"> Quantitative Paediatric surgery to intensive care unit All medical team members 	<p>A new protocol which includes 4 steps: pre-handover, equipment and technology, information, discussion and plan</p> <p>The new protocol includes 11 safety themes</p>	<p>Paper uses formula 1 pit-stop and aviation training models and reports on the development of a new clinical handover standardised operating protocol for paediatric surgery to paediatric intensive care unit handover in a UK hospital.</p> <p>The paper presents findings showing significant improvements in technical errors (regression analysis showed $t = -3.63$, $P < 0.001$) and team work ($t = 3.04$, $P = 0.004$). The number of information omission was reduced from 2.09 to 1.07. Duration of handover was reduced from 10.8 minutes to 9.4 minutes.</p>	<p>This is a very well structured study and paper, which explains the rationale for change, the changes made and the process and evaluation of the clinical handover intervention.</p>
1	Cheah et al, 2005	<ul style="list-style-type: none"> Quantitative Shift-to shift handover Medical practitioners, medicine and surgery only 	<p>Electronic clinical handover, including minimum data set</p> <p>The handover message itself is free-text</p>	<p>Paper describes the development of a minimum data set and its incorporation into an existing electronic system at an Australian hospital.</p> <p>The paper reports on results of a survey of doctors on the adequacy of the handover system and the use of free-text fields.</p> <p>The minimum data set for handover includes: patient name, age, date of admission, location, consultant responsible for care, treating unit, current diagnosis,</p>	<p>This is an interesting study, using free-text fields within an electronic tool.</p> <p>The culture of handing over and handing back is probably as important as the tool itself.</p> <p>The paper discusses the importance of electronic tools having functions to ensure transfer of responsibility and accountability.</p>

				<p>results of recent investigations, handover notes, update diagnosis, recent procedures and dates.</p> <p>The time taken to complete a handover entry was about 10 minutes for the whole unit.</p> <p>While the system provided adequate information regarding patient details, the free-text handover entry was often deficient in particular information.</p> <p>Handback was only completed in about 50% of patients with significant events.</p>	
1	Kassean and Jagoo, 2005	<ul style="list-style-type: none"> • Quantitative • Shift to shift • Gynaecological ward, nursing handover 	Using a change management to move to bedside handover (with patient participation)	<p>Paper presents a study to implement bed-side nursing handover to allow patient participation on a gynaecological ward at a hospital in Mauritius. The approach outlined adapted Spradley's 8-step model and Lewin's 3-step model of unfreezing, moving and refreezing as a change management framework.</p> <p>The paper reported the change management process was successfully implemented to the satisfaction of patients and staff.</p> <p>The change was from nurses' station to patient bedside with patient participation.</p> <p>Using this framework, the team</p>	<p>This paper provides an extensive discussion on challenges and factors required to sustain change.</p> <p>While this paper provides short and medium term evaluation, it does not provide long term follow up data to test the theory of sustainable change.</p>

				<p>found that they achieved the bench-mark of good handover all the time.</p> <p>Importantly, the authors detailed all the steps taken for change management.</p>	
1	Petersen et al, 1998	<ul style="list-style-type: none"> • Quantitative self-report system to identify adverse events • Shift to shift • Medical handover 	Computerised handover system	<p>Paper reports on the evaluation of a 4 month computerised handover program intervention to improve continuity of care.</p> <p>The study found that the computerised system reduced adverse events related to cross-coverage, although the number of events was small and statistical significance was difficult to demonstrate.</p> <p>The team then analysed self-reported adverse events.</p> <p>There was a significant reduction in adverse events after the intervention with computerised handover (2.4% versus 3.9%).</p> <p>There was a trend towards reduction in preventable adverse events (1.7% versus 1.2%).</p> <p>The odd ratio of adverse event during cross-coverage declined from 5.2 (from baseline) to 1.5 post-intervention.</p> <p>The program was well received by doctors and continued to be used by the majority of doctors.</p>	While there are statistical issues with small samples, this paper has demonstrated that computerised handover systems improve patient safety reasonably conclusively.

1	Van Eaton et al, 2004	<ul style="list-style-type: none"> • Quantitative and description of the design process • Shift to shift handover • Medical residents 	Electronic handover system, linked to clinical information systems	<p>Paper presents a multi-step method to design and implement an electronic system to improve shift-to-shift handover among residents at two US teaching hospitals.</p> <p>The electronic handover system consisted of automatic data retrieval from the existing clinical information system and from data entry by residents.</p> <p>The system was widely utilised and adapted by residents for handover.</p> <p>The paper does not present results of any evaluation of the impact of the system on patient care.</p>	<p>This paper describes the experience of a hospital in designing and implementing an electronic handover system.</p> <p>While the study provided information regarding the perceptions of users, it did not evaluate the information and/or patient outcomes after the implementation of the system.</p>
1	Van Eaton et al, 2005	<ul style="list-style-type: none"> • Quantitative study, prospective randomised, cross-over study • Shift to shift • Medical handover 	Computerised handover systems	<p>The authors conducted a prospective, randomised, cross-over 5 month study to evaluate the effect of computerised handover system on continuity of patient care amongst 14 inpatient resident teams.</p> <p>The results found that the computerised system improved patient care and reduced time taken for ward rounds.</p> <p>The computerised system reduced the overall number of patients missed on resident</p>	<p>This study shows significant positive outcomes with a computerised system and is one of the few prospective randomised cross-over studies on handover.</p>

				<p>rounds by half (5 to 2.5 patients/team/month).</p> <p>The quality of handover was reported as better by residents.</p> <p>The computerised systems reduced the mean portion of pre-rounding time spent photocopying data from 24% to 12%. It shortened the overall team rounds by 1.5 minutes per patient.</p>	
1	Webster, 1999	<ul style="list-style-type: none"> • Action research with quantitative evaluation • Shift to shift handover • Nursing handover 	Bedside handover	<p>Paper reports on the use of an action research methodology to improve handover from traditional office based handover to bedside handover amongst nurses at a UK hospital.</p> <p>The study was undertaken on a medical ward for people over 65 years old and aimed to identify whether after 6 months of bedside handover staff felt issues previously identified had been addressed.</p> <p>Results point to improved interaction/satisfaction amongst both patients and staff.</p> <p>The team identified four key areas of concerns: lack of patient involvement, the use of derogatory terms, lack of relevant nursing information and excessive time to discuss non-patient centred information. Changes</p>	<p>This paper presents and an interesting examination of change management strategy to bed-side handover. Importantly, critical success factors are well presented and this improves transferability of the change management strategy.</p>

				<p>were made to assist staff to utilise new tools for bedside handover.</p> <p>Paper identifies that critical success factors are the belief of the team and the perception of the role of patients.</p>	
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CATEGORY 2 – Interventions, Critical Success Factors and Effectiveness					
Category	Author	Study Type	Intervention and/or Approach	Outcomes and/or Recommendations	Comments
2	Alem et al, 2008	<ul style="list-style-type: none"> Case study, using mixed methodology of quantitative observation and interviews Shift to shift Emergency department and general medicine, medical officers 	<p>Information tools:</p> <p>A patient information sheet, 1 page summary of patient's information</p> <p>An event sheet listing every patient mentioned</p> <p>A patient list, with highlights of those mentioned in a prior handover</p>	<p>[Refer to section 3.4 Above].</p> <p>Paper presents a two phase study involving a pilot survey and a case study involving an intervention at an Australian metropolitan teaching hospital. A weekend handover sheet/information tool was implemented.</p> <p>Results: Patients who were mentioned during a prior handover, were more likely to be mentioned again when information tools used.</p> <p>The particular intervention was reported to lead to more continuity on "who" was discussed.</p> <p>There were no details on the nature of the subsequent handover discussions.</p>	<p>The paper is useful but raises a number of questions regarding the outcomes and conclusions.</p> <p>Firstly, the observations were carried out by non-clinical researchers and therefore the exact nature and importance of following handover discussions is difficult to determine.</p> <p>Secondly, it was a short study (2 weeks pre and 2 weeks post) and there are a number of questions unaddressed relating to tool implementation.</p> <p>Finally, patient outcomes were not measured or discussed.</p>
2	Alvarado et al, 2006	<ul style="list-style-type: none"> Qualitative Shift to shift Nursing handover 	Standardised operating protocol	<p>Paper describes the development, pilot implementation and evaluation of evidence based transfer of accountability guidelines and a bed-side patient safety checklist for nurses at a Canadian hospital.</p> <p>The evaluation reports improvements in patient care.</p>	<p>This article describes in detail, the rationale, the steps and the challenges of implementing a standardised operating protocol.</p> <p>It is interesting to consider whether this project is transferable to other disciplines and facilities.</p>

				<p>The guiding principles for change were clearly defined.</p> <p>A detail implementation guide (5 step guide) was included.</p> <p>The evaluation of this study, while comprehensive, was ongoing and had not been completed.</p>	
2	Bourne, 2000	<ul style="list-style-type: none"> • Methodology unclear, although it seemed to involve mainly literature review • Shift to shift • Nursing handover 	Standardised operating protocol and implementation guide	<p>Paper describes the development and presentation of a standardised operating protocol for nursing handover.</p> <p>This UK paper provides an overview of standard statements on handovers and on handover standard monitoring tools.</p> <p>The paper does not present any results of the implementation of the protocol presented.</p> <p>There was no evaluation or validation of the protocol in the article.</p>	This paper is interesting but presents few details on implementation or evaluation of the SOP.
2	Broekhuis and Veldkamp, 2007	<ul style="list-style-type: none"> • Quantitative • All departments within the hospital • Medical practitioners 	Multiple steps reflectivity method, including dialogue, reflection, and follow up	<p>Paper describes the use and feasibility of the reflectivity method for stimulating learning and change amongst doctors at a hospital in the Netherlands.</p> <p>The method has several stages and is reported as being useful in affecting positive change in clinical handover structure, rules, protocols and 'atmosphere'.</p> <p>Evaluation was conducted</p>	<p>The team uses a reflective methodology to identify strategies and recommendations for handover improvement.</p> <p>The exact improvements differ between departments.</p> <p>The evaluation conducted is self-reported and it is difficult to assess transferability.</p>

				<p>through self-report by directors, and surveys of members of the different committees and staff.</p> <ul style="list-style-type: none"> • 50% of the recommendations were implemented. • 18% were nominated for improvement but required more preparation time. 	
2	Chacko et al, 2006	<ul style="list-style-type: none"> • Methodology not described • Medical officers • Shift to shift 	Electronic tool, with standardisation	<p>Paper describes the 'eHand-offs' tool produced by IBM, Lotus and Domino designed for electronic patient sign outs at US hospitals. The paper claims that the tool helps improve continuity of care, reduce medical errors and improve resident supervision and training.</p>	<p>This is a short paper presentation. There is no clear description of the methodology and no evaluation is described.</p>
2	Davies and Priestly, 2006	<ul style="list-style-type: none"> • Reflection • Shift to shift • Nursing handover 	Personal reflection method to create a care sheet, containing standard fields	<p>Paper presents a study into the use of a personal reflection method in combination with a literature review to derive a care sheet for nursing handover in a UK hospital. User evaluation of the care sheet implementation reported staff commitment and support, perceived reduction in handover duration and increased efficiency.</p>	<p>The process of evaluation is not described in detail and it is not clear how the care sheet was validated.</p>
2	Fenton, 2006	<ul style="list-style-type: none"> • Quantitative • Shift to shift • Nursing (geriatric) 	Minimum data set and an information guide	<p>Drawing on the 'essence of care' as a guide, this paper describes the development of a handover guide incorporating minimum data</p>	<p>The paper does not provide detail on how staff perceived the new process. While adaptation of standard guidelines was stated as important,</p>

		ward)		<p>sets to assist standardisation of handover.</p> <p>Evaluation conducted reports improved information transfer after the implementation of the minimum data set.</p> <p>Initial implementation faced the problem of increasing handover time.</p> <p>Once staff became familiar with the process, the time taken returned to baseline.</p> <p>Standard guidelines required adaptation.</p>	<p>the article did not provide a guidance on how this was or should be done.</p> <p>Furthermore, the study did not clearly describe how the change process was conducted.</p>
2	Grainge et al, 2005	<ul style="list-style-type: none"> • Quantitative documentation audit • Weekend shift to shift • Medical doctors 	Minimum data set consisted of weekend management plan	<p>Paper reports on the outcomes of using a weekend standardised minimum data set for handover among medical doctors at a UK Hospital.</p> <p>The results of the study found improvement in the documentation including a weekend plan and resuscitation decisions.</p> <p>User feedback recorded found the minimum data set form to be straightforward and user friendly.</p> <p>Importantly, this did not lead to improvement of weekend review or documentation of discharge date.</p> <p>More importantly, the information tool artefact actually reduced the</p>	<p>This study is important as it shows that information tools, if not designed properly, may cause detrimental effects on certain part of information exchange at handover.</p>

				detail decisions regarding DVT prophylaxis.	
2	Harrison et al, 2005	<ul style="list-style-type: none"> Methodology not described Junior medical officers Shift to shift handover 	A simple word processor list, containing: patient demographics, procedures and diagnosis, current treatment and potential problems, health status and tasks to be completed	<p>Paper presents design, implemented and evaluation of the use of a simple handover list using a word processor package containing information on tasks and priorities to be performed on patients at a hospital in the UK.</p> <p>The paper reports improved flow of information for junior clinicians.</p>	<p>This paper describes a simple intervention. The approach and detail of the intervention provided are limited in relation to the design and evaluation phases.</p> <p>The paper does not provide detail on how the results/conclusions were derived.</p>
2	Horwitz et al, 2007	<ul style="list-style-type: none"> Quantitative evaluation Shift to shift handover Medical staff 	1 hour curriculum on oral handover and a standardised format for handover	<p>Paper presents the development of a 1 hour curriculum program to improve verbal sign out skills of medical house staff.</p> <p>The paper describes the implementation of the program curriculum at 3 US hospitals.</p> <p>The paper also presents results of the program's evaluation revealing significant improvement in confidence of participants.</p> <p>The team followed a step model to develop the curriculum: a needs analysis through local survey; a literature review to understand the handover process; goal setting; developed a standardised format for oral communication; delivery of formal teaching and practice; and evaluation of the workshop.</p>	<p>This paper is interesting but evaluations only reached medical students. It is therefore difficult to draw conclusion regarding the impact of educational program on performance changes.</p>

2	Kelly, 2005	<ul style="list-style-type: none"> • Quantitative survey • Shift to shift • Nursing handover 	Change Management to bedside handover	<p>Paper describes the change of handover from office-based to walk-around, bedside based handover in a 12-bed rehabilitation ward.</p> <p>Four months after the trial, an evaluation survey found that nurses thought that they were better informed on patient's care.</p> <p>Evaluation from the perspective of patients indicated that they were more involved in their own care because of the new handover system.</p>	The description of the change management process lacks detail. The transferability of this study is therefore limited.
2	Kennedy, 1999	<ul style="list-style-type: none"> • Mixed method • Shift to shift • Nursing handover 	Non-verbal handover with clear documentation	<p>Paper reports on a project to improve nursing handover at a UK hospital by promoting the use of clear documentation and non-verbal nursing handovers.</p> <p>The study reports on findings that show improved documentation of handover provides stronger continuity of care.</p> <p>A multi-step process to improve handover was described. Observational study was conducted to document baseline problems. The team then introduced care plan documentation, through education and training.</p> <p>Evaluation found that nurses still</p>	It is important to emphasise that the handover documentation complements the verbal handover in practice.

				<p>passed on information verbally but in a very specific format.</p> <p>The documentation (non-verbal handover) was found to be very useful in guiding patient care.</p>	
2	Lee et al, 1996	<ul style="list-style-type: none"> Quantitative, prospective, randomised controlled trial Shift to shift Medical handover 	Standardised handover card with minimum data set	<p>Paper describes the use of a standardised handover card within a prospective randomised controlled trial amongst interns at a Mayo Clinic in the US.</p> <p>The paper reports significant improvement in the quality of handover amongst the active arm as compared to the control.</p> <p>Over 92 days, there were a total of 1385 patient care episodes.</p> <p>Poor handover was reported on 5.8% in the intervention group, compared with 14.9% in the control group, with a p value of 0.16.</p> <p>80% of the interns reported that the standardised card helped them stay organised and improved patient care.</p>	<p>This study could be strengthened if the patient adverse events and mortality had also been measured and presented.</p> <p>This detailed design and implementation plans were not provided in the paper. Therefore, the transferability of this study is limited.</p>
2	McCann et al, 2007	<ul style="list-style-type: none"> Quantitative survey Junior medical officers Shift to shift handover 	Minimum data set	<p>Paper describes a quantitative survey study which investigated the perception of handover among junior medical officers and nurses.</p> <p>Study found that nurses rated their handover better than junior</p>	<p>This paper provides good reasons for viewing clinical handover among junior medical officers as a priority in patient safety initiatives.</p> <p>The paper, however, does not provide evaluation data regarding the implementation of the minimum data</p>

				<p>medical officers.</p> <p>Junior medical officers were more likely to encounter problems related to handover than nursing.</p> <p>A standardised format of handover, known as JUMP was developed and implemented, which stands for jobs outstanding, "unseen" patients, medical contacts and patients to be aware of.</p>	<p>set.</p>
2	McGee-Lennon et al, 2007	<ul style="list-style-type: none"> • Quantitative evaluation • Shift to shift handover • Nursing handover 	<p>Handheld computer device (personal digital assistant), with handover function</p>	<p>Paper describes the implementation of a handheld computer system for nursing handover within three Scottish hospitals emergency care teams.</p> <p>The paper also reported on evaluation of how the system was used and accepted by nurses.</p> <p>The paper describes positively rated features of the tool including generation of a printed handover sheet.</p> <p>Staff found the system easy to use and useful for allowing information sharing.</p> <p>The major negative was the time taken to enter data into the electronic system.</p> <p>Technically speaking, battery life and screen sensitivity were important.</p>	<p>This is an interesting but short 3-4 month evaluation.</p> <p>The paper acknowledges that subsequent longitudinal evaluation is necessary to assess the sustainability of the intervention.</p>

2	Mikos, 2007	<ul style="list-style-type: none"> • Description of change process • Shift to shift • Nursing handover 	Phone recording Standardised content with SBAR technique	<p>Paper reports on the use of the SBAR technique in combination with phone recordings of nursing handover at a US hospital medical centre.</p> <p>The paper reports improvements in patient safety and quality of care since the implementation of the system.</p> <p>Other benefits reported include a streamlined handoff process, reduced patient falls during shift change, increased response times to patient call lights and reduced reporting time by 70%.</p> <p>There was a significant reduction in interruption and the average length of handover has reduced from 6 minutes to less than 2 minutes per report.</p>	<p>The paper states that evaluation and monitoring are easier to achieve with phone recording.</p> <p>However, not enough detail is provided to be able to assess the validity of this statement.</p>
2	Morrison, 2006	<ul style="list-style-type: none"> • Quantitative survey • Shift to shift handover • Medical officers 	Electronic clinical handover system, known as iHandover	<p>Paper presents details of the development and implementation of the iHandover junior doctor electronic clinical handover system at an Australia hospital.</p> <p>A one year evaluation of the implemented system found that 66% of respondents perceived that the new system supported improved handover.</p> <p>The project started with face to face interviews and group</p>	<p>Unfortunately no detailed publications on this project were identified.</p> <p>However, the approach outlined is interesting and helpful.</p>

				<p>discussions. JMO discussion and observation were performed for about 2 months and identified organisational issues and human performance issues with handover.</p> <p>The intervention consisted of organisational (ensuring shift overlap and protected time), education and electronic handover implementation.</p>	
2	Nestel et al, 2005	<ul style="list-style-type: none"> Mixed quantitative and qualitative Peri-operative physician Unclear of handover type 	Creation of a special role and education on handover presentation skills	<p>Paper reports on the creation of a new role to assist handover at a UK hospital. The new role, the peri-operative specialist practitioner delivers care at either side of the operative period and routinely transmits patient information to consultant surgeons and anaesthetists.</p> <p>The paper also reports on a training programme on handover presentation skills developed around this role using adult learning theory.</p> <p>The paper reports the program successively achieved the goals of learning outcomes for staff fulfilling the new role.</p>	<p>Short paper with the main outcome measures being the learning acquired by the staff in the new role on the presentation of handover.</p> <p>There were no outcomes measures related to care or performance changes.</p>
2	Prouse, 1995	<ul style="list-style-type: none"> Methodology unclear Shift to shift 	Tape-recorded handovers	Paper describes a pilot study using tape-recorded nursing handovers at a Community Hospice in the UK.	The paper provides some guidance on how to implement tape-recorded handover.

		<ul style="list-style-type: none"> Nursing handover 		<p>The paper reports on resulting improvements in financial, reporting and time efficiency of handover.</p> <p>This study described the change to tape-recorded handovers.</p> <p>The evaluation process however was not described in detail.</p>	
2	Shendell-Falik et al, 2007	<ul style="list-style-type: none"> Appreciative inquiry method Emergency department to telemetry unit Nursing handover 	Appreciative inquiry method, the 5-D cycle: definition, discover, dream, design and destiny to implement change	<p>Paper describes the use of the appreciative inquiry 5-D Cycle change framework to improve nursing handover from an emergency department to a telemetry unit in a US hospital.</p> <p>The paper reports improved outcomes and presents inpatient handoff scripts and a standardized transfer form, protocols and other tools to assist the handover.</p> <p>This method focused on positives of the current process and encouraged staff in identifying and building on their most effective handover experiences.</p>	This paper presents an interesting and innovative approach to implementing handover change. Changes described were limited in terms of ability to transferability.
2	Talbot and Bleetman, 2007	<ul style="list-style-type: none"> Quantitative Ambulance officer to emergency department staff Verbal handover model 	Standardised format (minimum data set)	<p>Paper describes the development, implementation and evaluation of a standardised method for verbal communication between ambulance officers and emergency department staff in two large UK hospitals.</p> <p>Evaluation conducted found that</p>	<p>The paper did not provide details on the exact implementation method used or whether education and change management process were employed.</p> <p>The paper highlights that inter-professional handover requires further</p>

				<p>information retention did not improve as a result of this intervention.</p> <p>The implementation involved a modified version of the DeMIST verbal handover model.</p>	<p>in-depth study.</p>
2	Watkins, 1997	<ul style="list-style-type: none"> • Narrative description and literature review 	<p>Change management strategies</p>	<p>Paper provides a thorough review of change management and change strategy as well as a narrative description of the introduction of nursing bedside handover at a UK hospital.</p> <p>The evaluation was informal and demonstrated most patients welcomed the bedside handover and staff reported increased job satisfaction.</p>	<p>The paper does not provide detail on the change management strategies that were used in the hospital project.</p>
2	Williams, 1998	<ul style="list-style-type: none"> • Qualitative • Shift to shift • Nursing 	<p>Bedside clinical handover using a total change management approach</p>	<p>Paper describes how nurses on an acute medical ward in a UK hospital changed the way patient information was shared between patients and nurses.</p> <p>Following 4 months, a survey questionnaire recorded perceptions of improved consistency and continuity of patient care.</p>	<p>Evaluation includes general discussion with staff and content analysis of words used to describe the process.</p> <p>The article did not address lessons to be learnt for future handover implementations.</p>
2	Wilson, 2007	<ul style="list-style-type: none"> • Mixed method • Shift to shift • Nursing handover 	<p>Minimum data set (derived from literature review) Implementation</p>	<p>Paper presents the design and development of a minimum data set for inclusion in a nursing handover report template and the implementation of this template in</p>	<p>The paper describes a highly variable implementation process that appears to have impacted on the variability of responses recorded from participants.</p>

			Evaluation through audits and informal discussion	to 5 units within a US hospital. The study evaluated the use of this template and found that it was useful for junior staff, improved information transfer but met with some resistance from senior nurses who felt their handover to already be good.	
2	Wong et al, 2007	<ul style="list-style-type: none"> • Qualitative, user-centred design framework • Junior medical officers, general medicine • Shift to shift 	Electronic handover support tool with minimum data set	<p>Paper describes a case study into the development of an electronic support tool for clinical handover for junior medical officers.</p> <p>The study utilised qualitative field techniques and information systems techniques to involve clinicians as co-participants in the development. The approach conceptualised the system to be built as a support tool rather than as a 'total solution'.</p> <p>The study analysed the data generated on key issues and identified safety features which could be incorporated into systems design of an electronic clinical handover tool.</p> <p>The tool incorporated 6 features for patient safety: patient identification, patient admission list, pathology results, transfer of information through issues, actions and comments, transfer of responsibility through electronic tick off, handover urgency</p>	<p>This paper presents a methodology to incorporate socio-cultural understanding into electronic system design. The design features are based on patient safety concerns and the paper argues for the need to transfer responsibility as well as information.</p> <p>There is no evaluation of the system provided in this paper.</p>

				<p>categorisation and handover alert.</p> <p>Through early and continual involvement of clinicians in the project, this case study highlights how socio-cultural analysis can be translated meaningfully (in terms of the end-users) into systems design.</p>	
2	Wong et al, 2008	<ul style="list-style-type: none"> • Qualitative observations and intervention • Medical doctors • Shift to shift handover 	Change management for electronic handover system	<p>Paper describes the change management principles to design and implement an electronic clinical handover support tool.</p> <p>The team engaged clinicians from the initial phase of the project and they emphasised the need to continually engage clinicians.</p> <p>They team found that clinicians might not understand their own work flow and therefore it was important to conduct observation sessions as well.</p> <p>The team argued for the need to involve clinicians in the design phase of electronic tools.</p> <p>The study then identified the challenges of implementation of electronic clinical handover support tool.</p> <p>The study argued for the need to take the views of both opponents and proponents of electronic tools into account.</p> <p>The study concludes with the</p>	<p>This paper describes in detail the experience of one Australian hospital. Evaluation data from the study was not included in this paper.</p>

				provision of a framework for sustainable change and improvement.	
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CATEGORY 3 – Interventions, Critical Success Factors and Effectiveness					
Category	Author	Study Type	Intervention and/or Approach	Outcomes and/or Recommendations	Comments
3	Benson et al, 2007	<ul style="list-style-type: none"> Literature review, survey and discussion forum Shift to shift Nursing handover 	Development of standardised operating protocols and framework for implementation	<p>Paper presents a detailed standardised operating protocol for nurses based on a literature review, quantitative survey and discussion forums.</p> <p>Developed in Canada the protocol includes multiple steps including principles of handover, guidelines, documentation tools, educational strategies, evaluation and project completion.</p> <p>The study defines 11 principles of nursing shift-to-shift handover, which covers the broad aspects of legal requirements, organisation statements, nursing practice standards, confidentiality, timeliness, continuity and verification of report, safety and patient concerns as well as development of collegial relationship of patient care team members.</p> <p>The article provides a set of guidelines for nursing shift to shift handover.</p>	<p>This paper presents a comprehensive standardised operating protocol and a clear framework for implementation and evaluation.</p> <p>It will be interesting to do a subsequent follow-up to learn how this works in practice.</p>
3	Currie, 2002	<ul style="list-style-type: none"> Quantitative questionnaire Emergency 	Minimum data set	Paper presents the use of a questionnaire method to generate six areas of priority for emergency	<p>The paper presents a minimum data set and guidelines.</p> <p>These were not implemented and no</p>

		<p>department shift to shift</p> <ul style="list-style-type: none"> • Nursing handover 		<p>department nursing handover at a UK hospital.</p> <p>Based on data analysis the paper recommends the 'CUBAN' five step handover guideline to improve quality.</p> <p>CUBAN is not evaluated in this paper.</p>	<p>evaluation was conducted.</p>
3	Halasyamani et al, 2006	<ul style="list-style-type: none"> • Description of the development of a discharge checklist • Hospital to community • Between clinicians 	Minimum data set	<p>Paper reports on the development and outcome of a process to produce a comprehensive checklist of processes and elements considered necessary for optimal patient (particularly the elderly) handoff at hospital discharge.</p> <p>The paper does not present information on the implementation or evaluation of this discharge checklist.</p>	<p>There is no implementation in this study.</p>
3	Kellogg et al, 2006	<ul style="list-style-type: none"> • Ethnographic research method • Shift to shift • Surgical residents 	Ensuring handover happens through leadership and top-down support	<p>Paper describes the changes from long-shift to shorter shift in surgical residency in a US hospital.</p> <p>Deploying ethnographic methods over a 15 month period the paper studies reveals resistance to change on handover resulting from work hour restrictions and highlights how resistance can be addressed to improve handover</p>	<p>The paper clearly articulated the importance of understanding the medical hierarchy and culture in order to implement changes.</p> <p>Any change needs to take into account the socio-cultural and political context.</p>

				through an awareness campaign. This resulted in significant recorded improvement.	
3	Morris and Baker, 2005	<ul style="list-style-type: none"> Qualitative description of the process 	Electronic handover platform within the clinical information system	<p>Paper describes the development of a handover module within an existing multi-hospital clinical information system in Australia.</p> <p>The paper presents the development and pilot study design/implementation of the existing information system to incorporate clinical handover.</p> <p>Paper covers project initiation, systems design and system functionality.</p>	The paper does not describe the implementation process and there is no evaluation of systems implementation or outcomes.
3	Patterson et al, 1995	<ul style="list-style-type: none"> Quantitative survey Patient handover between units Nursing handover across different specialties 	Minimum data set development	<p>Paper describes the use of a consensus quantitative survey method to derive minimum data set across different disciplines of nursing staff at a large US hospital.</p> <p>The paper does not present information on the implementation or evaluation of this minimum data set.</p> <p>This survey study involved 438 nurses across different specialties. The study identified a list of critically important universal information content for inter-departmental patient transfer: history of present illness and procedures; consciousness;</p>	<p>This paper identifies important minimum data set.</p> <p>However, the implementation of the minimum data sets was not described.</p>

				<p>medical diagnosis and problems on sending unit; Mental comprehension and short term memory; Physician's orders; Reason for transfer; Safety considerations; Vital sign problems; allergies; cardiovascular status and respiratory status.</p> <p>The paper also lists critically important specialty information for each of the six groups investigated: perioperative, ICU, medical-surgical, psychiatry, outpatient and long term care.</p>	
3	Singer and Dean, 2006	<ul style="list-style-type: none"> • Review • Emergency physician • Shift to shift 	Standardised protocol	<p>Paper presents a review of the effectiveness and efficiencies of emergency department inter-shift handovers and recommendations for parameters for pre-handover, inter-shift meeting, and post-handover activities.</p> <p>No outcome measures are presented.</p>	Good overview of the problem and a suggested solution.
3	Turner et al, 2006	<ul style="list-style-type: none"> • Mixed methodology • Junior medical officers • Shift to shift handover 	Electronic clinical handover	<p>This research-in-progress paper describes an in-depth study using multiple different techniques to understand the potential of information technology to improve clinical handover.</p> <p>The study found that clinical handover served multiple different purposes and there were multiple</p>	This paper provides important insights regarding the perception of clinicians towards electronic clinical handover. It provides suggestion for information systems and technology expert to engage clinicians.

				<p>different factors that affected clinical handover.</p> <p>The study highlighted that the clinicians were doubtful of the benefits of information technology in clinical handover and resistant to the idea of process change.</p> <p>The paper concluded by suggesting ways that information technology and information systems experts can work together with clinicians to design electronic tools for clinical handover improvement.</p>	
3	Yee et al, 2006	<ul style="list-style-type: none"> • Qualitative observations and interviews • Junior medical officers, general medicine • Shift to shift 	Suggested intervention of systemic changes in combination with education and feedback	<p>Research-in-progress paper described the methodological approach of combining qualitative field techniques with information and clinical analysis in order to achieve a holistic view and holistic intervention in clinical handover.</p> <p>The paper presented data to support the argument that systemic changes might not be adequate for clinical handover improvement.</p> <p>The paper emphasised the need to empower junior medical officers, through education and feedback, in combination with systemic changes in order to achieve clinical handover improvement.</p>	<p>This paper presents a new methodological approach in order to meet the needs of clinicians and information systems experts, while maintaining the holistic view of handover process. It provides a strong argument that systemic changes need to be complemented with changes in human behaviour for the best outcomes.</p>

CATEGORY 4 – Interventions, Critical Success Factors and Effectiveness			
Category	Name	Type: Opinions and Reviews	Commentary
4	Bernau et al, 2006	Opinion theme: Minimum data set	This paper provides an opinion on the characteristics of good handover. The paper provides a minimum data set, which includes patient name, age and location, presenting complaint, working diagnosis and treatment given for handover. It is a good summary for junior doctors and medical students.
4	Groah, 2005	Opinion theme: Standardised operating protocol	This is an opinion piece which argues the importance of good handover. It suggests an approach to designing systems and processes to improve handover.
4	Hoban, 2003	Opinion theme: Communication	The paper presents a concise summary of a five step communication model to enhance nursing handover whether face-to-face, written or recorded. The five steps are: Avoid jargon and explain abbreviations. Keep individual information relevant. Keep note-taking to a minimum. Promote patient confidentiality. Promote accuracy. There is no data analysed or evaluated regarding whether these strategies work to improve handover.
4	Nagle and Judd, 2006	Opinion and literature review theme: Minimum data set	This paper argues for the need to establish minimum data set in order to best leverage technology for transfer of patient care. The paper suggests that a minimum data set should include at least seven main categories: patient demographics, history, diagnosis, therapeutic information, functional information, social information and relevant behavioural information.
4	Vidyardhi et al, 2006	Opinion and case studies themes: Minimum data	This is a very detailed overview paper, which describes the current practices of clinical handover and the existing practice and experiences at 3 academic internal

		Set, Standardised operating protocols (SOPs)	medicine programs. The article suggests an effective handover process and handover content. The article includes a minimum data set, known as ANTICipate. It also includes a checklist for process improvement, which includes the heading of who, what, where, when and how. This is a very useful paper for those interested in clinical handover improvement.
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CATEGORY 5 – Interventions, Critical Success Factors and Effectiveness			
Category	Name	Type: Report	Commentary
5	Australian Council for Safety and Quality in Health Care, 2005	Clinical handover and patient safety: Literature review report	<p>This literature review, conducted by the Australian Resource Centre for Healthcare Innovation (ARCHI) aims to identify factors relating to clinical handover that are associated with patient safety; the effectiveness of a safety culture within non-health industries and the quality of evidence and gaps in research.</p> <p>Specific remarks on interventions, critical success factors and effectiveness include:</p> <ul style="list-style-type: none"> • Training and specialised roles for communications between clinicians is beneficial. • Multi-disciplinary handovers is helpful. • Within the non-healthcare sector, clear guidelines, work processes and documentations help to improve handover.
5	Australian Medical Association (AMA), 2006	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover and provides examples of good models of handover from which doctors and hospital managers can learn from. Emphasizes continuity of information, the need for organisational change, care planning and prioritization of tasks and recognises range of handover types.</p> <p>Specific remarks on interventions, critical success factors and effectiveness include:</p> <ul style="list-style-type: none"> • Provides guidelines as to how handover should be carried out i.e. who should be involved, when it should take place, where it should take place, how should it happen and what needs to be handed over. • Provides guidelines as to the information that needs to be handed over. • Provides basic guidance to electronic tools to support handover but at the same time stresses that information technology should not be used in isolation as handovers are complex processes. • Suggests that some important aspects of handover should be taught prior to commencement of employment. • Provides working examples of good handovers.

5	British Medical Association (BMA) and National Health Service (NHS), 2004	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover. It provides examples of good handover and aims to derive further developments in standardising handover arrangements in hospitals in the United Kingdom.</p> <p>Specific remarks on interventions, critical success factors and effectiveness include:</p> <ul style="list-style-type: none"> • Provides guidelines as to how handover should be carried out i.e. who should be involved, when it should take place, where it should take place, how should it happen and what needs to be handed over. • Provides some basic guidance for electronic tools to support handover. • Provides guidelines as to the information that needs to be handed over. • Provides a strong emphasis for education and training in handovers. • Provides working examples of good handovers.
5	Royal College of Surgeons of England, 2007	Safe handover: Guidance from the working time directive working party	<p>This is the report from the Royal College of Surgeon of England regarding safe handover.</p> <p>Specific remarks on interventions, critical success factors and effectiveness include:</p> <ul style="list-style-type: none"> • Sufficient time must be set aside for handover. • Training of junior members is important. • Standardised protocols without interruptions is important. • Provides a minimum data set for surgeons. • Provides guidelines for good handover practice for surgeons.
5	World Health Organisation (WHO) and Joint Commission International Centre for Patient Safety (JCI), 2008	Patient safety solution 3: Communication during patient handovers	<p>This is a joint report by the World Health Organisation and the Joint Commission International Centre for Patient Safety. It describes Patient safety solution 3: Communication during patient handovers.</p> <p>Specific remarks on interventions, critical success factors and effectiveness include:</p> <ul style="list-style-type: none"> • Face-to-face communication with opportunity for clarification is important. • System redesign of care delivery is the most effective way to address handover

			<p>problems.</p> <ul style="list-style-type: none">• Common communication platforms such as SBAR are important.• Standardised operating protocols might be helpful.• Minimum data sets might be helpful.• “Read back” techniques are useful.• Electronic tools are useful in preventing adverse events.• Multi-disciplinary rounds are used effectively to improve handover.• Patient and family involvement are being recognized as an important aspects in care delivery.• Incorporating training into education curricula.
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5. *Evidence gaps in clinical handover*

This section presents and discusses the major themes, issues and results identified within the literature pertaining to evidence gaps in clinical handover. It should be noted that this section is not attempting to provide a conceptual map of existing evidence gaps on clinical handover rather it is presenting themes that were identified in the literature either explicitly as evidence gaps or as emerging directions for future activity and/or research. It is worth noting that no materials were identified that had 'evidence gaps in clinical handover' as the focus of the publication and no materials clearly addressed the issue of sustainability. The section begins with a summary of major themes, followed by a presentation of key issues and results reported in the peer-reviewed literature relating to each of these themes. The section ends with a summary table that presents a structured review of all materials selected and categorised as relevant including non-peer reviewed materials, published opinions and reports.

The major themes identified in the literature relating to evidence gaps in clinical handover can be summarised as follows:

- **Patients perception and involvement in clinical handover:** literature highlights that the role of patients during handover remains complex and under-researched. Patients perceptions in relation to care management and its impact on trust and care satisfaction is identified as an area requiring further investigation.
- **Morning report format:** literature highlights that morning report is not common in Australia and has been under-researched. Literature indicates positive potential for reducing length of stay and increased availability from engaging in morning report based on a single pilot study.
- **Private hospital settings:** literature on private hospital handover is very limited with only one study identified. This study focused on nursing handover reporting improved overall efficiency and effectiveness from implementing change based on action research principles.
- **Professional anxiety and handover:** literature on professional anxiety during handover is limited with only one study identified. This study explored the issue in relation to nursing change of shift handover and points to the need for further research.
- **Frameworks and handover:** literature on holistic frameworks to assist in improving handover was explicitly identified as being required. A few studies in this direction have developed approaches that have been implemented with hand-offs in general medicine; safety transitions in emergency care; and, socio-technical approaches to developing tools.
- **Work process mapping and design methods:** literature examining the use of work process mapping to understand handover and to assist with technology design for tools to improve handover remains under-researched. Experimental methods for identifying information and its recall by health professionals are also limited.
- **Education and training of students:** literature frequently mentions the role of education and training in handover but detailed studies on their structure, implementation or evaluation remain limited.
- **Inter-Hospital and patient transfer:** literature examining inter-hospital transfer is common but investigations of the handover aspects of the transfer are limited. Similarly although literature on patient transfer and retrieval are common, studies examining handover aspects are limited.
- **Electronic documentation and medical records:** literature explicitly investigating electronic handover documentation and/or links with integration into broader electronic health records systems remains limited.
- **Legal dimensions:** literature exploring the variety of legal dimensions pertaining to clinical handover continues to remain limited in the health literature.

A summary of key issues and results reported in the peer-reviewed literature relating to each of these major themes is presented below.

5.1 Patients perceptions and involvement in clinical handover

- Fletcher et al (2007) examines perceptions of patients and concerns of patients about treatment by either the same clinician who may be tired, or by a different clinician following handover that might cause discontinuity of care. The paper suggests the need for more research into how to design systems to minimize fatigue and discontinuity.
- Greaves (1999) explores patients perceptions of nursing bedside handover and their desire to be more involved (passively) and their recognition of confidentiality, continuity and neglect as key dimensions. This pilot study identifies the need for more research to investigate how this involvement can be addressed during handover.
- Cahill (1998) identifies gaps in understanding patients perceptions of handover and their implications for bedside handover.

5.2 Morning report format

- Fassett and Bollipo (2006) investigated various methods of conducting morning report, involving night team handing over to the day team at an Australian hospital. The study found that a format focusing on a brief presentation is the best way of providing an overview of patients and reported a reduction in bed access blocks, reduced average length of stay and increased bed availability from this pilot study. The paper recommends formal training on morning report and for more comprehensive studies into impact of bed management on morning report.

5.3 Private hospital settings

- McKenna and Walsh (1997) present an action research method aimed at improving nursing handover at a private Australian hospital. The study focused on an approach to facilitate conduct of handover in a 30 minute time-frame. The study highlights the need for more studies into differences in handover between private and public hospitals.

5.4 Professional anxiety and handover

- Evans et al (2008) report on the conduct of a psycho-analytical case study to demonstrate the importance of the implicit functions of nursing handover. The handover ritual is described as contributing to a reduction of professional anxiety that assists nurses to be able carry out their duties. Paper points to the need for more research into anxiety and relief mechanisms during handover.
- Manias and Street (2000) [Refer to section 3.4 above] highlighted the fear and anxiety experienced by staff during bedside handover. The study also reported that nurses experiences of being examined as part of the study affected their sensitivity to the need to convey accurate patient information during handover. Paper points to the need for more research into anxiety and relief mechanisms during handover.

5.5 Frameworks and Handover

- Arora et al (2008) builds on social science constructs and a case study of the implementation of a night float service at a US hospital. The authors present a theoretical framework to describe how handoffs affect both patients and physicians and suggest it contributes to filling a gap in competency based approaches to improving handoffs.
- Wilson et al (2007) use their evaluation of simple technological artefacts to argue for the need to take an holistic system based view of handover. The paper recommends using 'in use, in situ' evaluation, rather than pure usability testing when evaluating technology artefacts in

supporting clinical handover. The paper points towards the need for holistic frameworks to evaluate socio-technical aspects of handover.

- Behara et al (2005) describe a conceptual framework for characterising handover events. The paper suggests that the framework may help future studies to acquire a deep understanding of the multidimensional nature of handover and help develop interventions that fit the context of clinical work. They argue the lack of understanding of this multidimensionality in the 'one size fits all' approach to many handover interventions has contributed to their failure.

5.6 Work process mapping and design methods

- Tang and Carpendale (2006) describe an initial observational study method for understanding workflow and technology design problems. The paper points to the need for more research into techniques for linking work flow and technology designs for handover systems.
- Dowding (2001) describes the use of experimental methods to study the effects that manipulating information given in the change of shift report has on nurses' care planning ability. Paper points to a lack of evidence around the utility of experimental study designs for guiding handover interventions.

5.7 Education and training of students

- Arora et al (2008) [Refer to section 5.5 above] recommended core competencies in both communication training and professionalism training based on the conceptual (theoretical) framework described. The paper advocates the development of training materials and using "train the trainer" dissemination approaches.
- Yurkovich and Smyer (1998) highlight limited emphasis on education and training on clinical handover for medical and nursing students. The paper describes a learning project and its use of reflection and analysis of audiotape records during the psychiatric rotation and how this prepared the students to engage in professional nursing practice and behaviours.

5.8 Inter-Hospital and Patient Transfer

- Shirley and Hearn (2007) and Hearn and Shirley (2007) provide a review and opinion guide in two parts. The paper provides an overview of this emerging field of medicine and the need to develop better protocols and guides for handover. Although literature on patient transfer and retrieval are common, studies examining handover aspects are limited.
- Wong and Levy (2005) examines 22 patients who required transfer from rural and peripheral metropolitan areas and found that, among other factors, inadequate transport processes and delays in transfers directly contributed to adverse patient outcomes. Although there are numerous papers examining inter-hospital transfer, investigations of the handover aspects of the transfer are limited.

5.9 Electronic documentation and medical records

- Sarkar et al (2007) reports on a design process for the development of a problem based patient tracking tool called "Synopsis" (sign-out, information retrieval and summary) to support patient tracking, sign-outs and daily rounds at a US hospital. The handover tool described has direct links with the electronic medical records system and produces electronic documentation. Literature explicitly investigating electronic handover documentation and/or links with integration into broader electronic health records systems remains limited but is clearly an emerging area.

5.10 Legal dimensions

- Forrester et al (2005) provide an opinion article with good supporting legal arguments covering the communication requirement, documentation requirement and handover requirement. This area will require further research to enhance understanding and provide guidance for future handover interventions. Legal dimensions of are not extensively covered in the health literature.

5.11 Summary Tables

The tables below present a structured review of all materials selected and categorised as relevant across all themes pertaining to evidence gaps in clinical handover. The tables also include non-peer reviewed materials, published opinions and reports. The tables present materials from each of the five categories. Within each category table materials are presented by author in alphabetical order. In this section (section 5) it should be noted that no Category 1 papers were identified.

CATEGORY 2 – Evidence Gaps on Clinical Handover				
Category	Name	Study type	Outcomes	Comments
2	Fassett and Bollipo, 2006	<ul style="list-style-type: none"> • Quantitative • Morning report • Acute care medical practitioners 	<p>Paper investigated various methods of conducting morning report, involving night team handing over to the day team at an Australian hospital.</p> <p>The study found that a format focusing on a brief presentation is the best way of providing an overview of patients and reported a reduction in bed access blocks, reduced average length of stay and increased bed availability from this pilot study.</p> <p>This case study reported users prefer a structured format, with senior clinicians attending the meeting.</p> <p>The paper recommends formal training on morning report and for more comprehensive studies into impact of bed management on morning report.</p>	<p>It is unclear whether morning report should be different from other shift-to-shift handover.</p> <p>This paper provides recommendations on how to run morning report.</p>
2	McKenna and Walsh, 1997	<ul style="list-style-type: none"> • Action research • Shift to shift • Nursing handover 	<p>Paper presents an action research method aimed at improving nursing handover at a private Australian hospital.</p> <p>The methodology was focused on 4 goals: developing different handover process for different wards, ensuring handovers were completed within 30 minutes, ensuring continuity of care during handover and ensuring continuity of care from one shift to the other.</p> <p>Different wards use different methods at</p>	<p>This is a study within private hospital setting, which potentially has different socio-cultural and financial implications.</p> <p>The study highlights the need for more studies into differences in handover between private and public hospitals.</p>

			different time (ie. verbal versus written). The article reported that at the end of the intervention all goals were achieved.	
2	Yurkovich and Smyer, 1998	<ul style="list-style-type: none"> Description of a learning project 	<p>Paper highlights limited emphasis on education and training on clinical handover for medical and nursing students.</p> <p>The paper describes a learning project and its use of reflection and analysis of audiotape records during the psychiatric rotation and how this prepared the students to engage in professional nursing practice and behaviour.</p> <p>There is no evaluation described in the paper.</p>	Education and training of students is critical to improving handover and more research is required into the utility and validity of different methods to ensure the development of best practice in approaches used.

CATEGORY 3 – Evidence Gaps on Clinical Handover				
Category	Name	Study type	Outcomes	Comments
3	Arora et al, 2008	<ul style="list-style-type: none"> • Case study • Medical handover 	<p>Paper describes the use of a case study to demonstrate a conceptual framework of the impact of handover on patients and physicians.</p> <p>The paper defines two aspects of a competency base approach to improve handover: communication (transfer of information) and professionalism (transfer of responsibility).</p> <p>The paper then presents some strategies to ensure competencies among trainees, including the development of dedicated educational materials and a “train the trainer” dissemination method.</p> <p>The paper discusses some evaluation techniques and argues for the need for handover to be included in medical education.</p>	Education and training for handover should be implemented and a standard curriculum needs to be developed.
3	Behara et al, 2005	<ul style="list-style-type: none"> • Ethnography • Emergency department shift to shift • Medical and nursing 	<p>Paper describes a conceptual framework for characterising handover events.</p> <p>The paper suggests that the framework may help future studies to acquire a deep understanding of the multidimensional nature of handover and help develop interventions that fit the context of clinical work.</p> <p>The paper argues the lack of understanding of this multidimensionality in the ‘one size fits all’ approach to many handover interventions has contributed to</p>	This paper develops and describes a framework which might allow future research and evaluation of interventions.

			<p>their failure.</p> <p>The paper highlights the process of handovers at different hospital differs substantially in their external characteristics but highlights several attributes of emergency department handovers which appeared to be universal.</p> <p>The conceptual framework addresses these four important attributes: the type of process, the primary content, structural issues and dynamic issues.</p> <p>The type of process was conceptualised into a product-process matrix and the current handover process is described as low standardisation, low volume with jumbled flow and job shop process.</p> <p>The content referred to the relative importance of information, authority and responsibility.</p> <p>The structure of the handover consisted of nature of participants, number of participants and probability of the receiving party having interaction with the same patients in the future.</p> <p>The dynamic component referred to a contextually sensitive adjustment of conversation about a given patient.</p>	
3	Cahill, 1998	<ul style="list-style-type: none"> • Un-structured interviews, grounded theory analysis • Studying patients 	<p>Paper identifies gaps in understanding patients perceptions of handover and their implications for bedside handover.</p> <p>Three major themes are identified:</p> <p>Maintaining a professional distance</p>	<p>Paper highlights patients involvement in bedside handover emerging as increasingly important.</p> <p>Here the role of the patient described is passive rather than active.</p>

		<ul style="list-style-type: none"> • Bedside clinical handover 	<p>(patients do not feel comfortable to participate and are happy with a passive role).</p> <p>Establishing professional sharing (bedside handover allows professional sharing and decision making, although sometimes it is not as comprehensive as it could be).</p> <p>Maintaining patient safety (the issue of bedside handover and safety is controversial).</p>	<p>Raises questions around how the role of patients may be influenced by patient empowerment discourses.</p>
3	Dowding, 2001	<ul style="list-style-type: none"> • Experimental design, quantitative evaluation • Shift to shift • Nursing handover 	<p>Paper describes the use of experimental methods to study the effects that manipulating information given in the change of shift report has on nurses' care planning ability.</p> <p>The paper studies two independent variables, schema consistency and structure of the shift and their effects on clinical handover.</p>	<p>Experimental design of individual components of handover may help in understanding.</p> <p>However, to guide interventions other factors need to be taken into account.</p> <p>Paper points to a lack of evidence around the utility of experimental study designs for guiding handover interventions.</p>
3	Evans et al, 2008	<ul style="list-style-type: none"> • Qualitative case study method • 14 handovers, approximately 1 week apart • Psycho-analytical analysis 	<p>Paper reports on the conduct of a psycho-analytical case study to demonstrate the importance of the implicit functions of nursing handover.</p> <p>The handover ritual is described as contributing to a reduction of professional anxiety that assists nurses to be able carry out their duties.</p> <p>The paper records that there were two prohibitions in handover rituals: on expressing a preference for a patient and on aggression.</p> <p>Prohibitions act within handover ritual to</p>	<p>It is important when changes are suggested, that the function of handover rituals are maintained.</p> <p>Paper points to the need for more research into anxiety and relief mechanisms during handover.</p>

			<p>keep particular knowledge forbidden.</p> <p>It was argued that handover, when it is ritualised, functions to alleviate anxiety.</p>	
3	Fletcher et al, 2007	<ul style="list-style-type: none"> Quantitative Studying patient's perception Acute care setting 	<p>Paper examines patients perceptions and concerns about treatment by either the same clinician who may be tired, or by a different clinician following handover that might cause discontinuity of care.</p> <p>Patients were divided about which was more likely to lead to problems: 45% indicated regular doctors who were tired, 39% indicated new doctors who were well-rested and 16% did not answer.</p> <p>The paper suggests the need for more research into how to design systems to minimize fatigue and discontinuity.</p>	<p>This is an interesting study trying to understand patients perceptions as they relate to problems of physician fatigue versus discontinuity of care.</p> <p>This is an area which is likely to stimulate further investigation.</p>
3	Greaves, 1999	<ul style="list-style-type: none"> Qualitative interview involving 4 patients 	<p>Paper explores patients perceptions of nursing bedside handover and their desire to be more involved (passively) and their recognition of confidentiality, continuity and neglect as key dimensions.</p> <p>Paper reports patients wanted to be involved in handover in a passive role to obtain information.</p> <p>Patients might be aware of confidentiality issues but were still keen to have bedside handover.</p> <p>Patients were concerned about their continuity of care and would like to ensure that continuity of care was clearly demonstrated to them.</p>	<p>The role of patients in handover is not clear and from very few studies conducted in this area, it seems likely a more passive role is preferred.</p> <p>This pilot study identifies the need for more research to investigate how this involvement can be addressed during handover.</p>

3	Manias and Street, 2000	<ul style="list-style-type: none"> • Critical ethnography • Critical care nursing • Shift to shift handover 	<p>[Refer to section 3.4 above].</p> <p>Paper describes the conduct of an ethnographic study of handover amongst 6 nurses in an Australian critical care unit.</p> <p>Results found that nurses involved in bedside handover did not actively participate in global handover conducted by nurse managers.</p> <p>The study also revealed the fear and anxiety experienced by staff during the bedside handover.</p> <p>The study also reported that nurses experiences of being examined as part of the study affected their sensitivity to the need to convey accurate patient information during handover.</p> <p>Global handover seems to serve the function of nurse co-ordinator rather than bedside nursing. Nurses tend to discount their own information needs.</p> <p>Nurses tend to identify deficiency of tasks performance, rather than recognising the difficult circumstances.</p>	<p>This study provides important insight into understanding of the impact of standard ritual practices, impacts on handover and nursing performance.</p> <p>Paper points to the need for more research into anxiety and relief mechanisms during handover.</p>
3	Sarkar et al, 2007	<ul style="list-style-type: none"> • Design of handover interface with electronic medical records 	<p>Paper reports on a design process for the development of a problem based patient tracking tool called 'Synopsis' (sign-out, information retrieval and summary) to support patient tracking, sign-outs and daily rounds at a US hospital.</p> <p>The handover tool described has direct links with the electronic medical records system and produces electronic documentation.</p>	<p>Literature explicitly investigating electronic handover documentation and/or links with integration into broader electronic health records systems remains limited but is clearly an emerging and important area.</p>

			The paper also describes the functionalities of the electronic system to support these activities.	
3	Tang and Carpendale, 2006	<ul style="list-style-type: none"> • Video analysis, interviews and questionnaires 	<p>Paper describes an initial observational study method for understanding workflow and technology design problems.</p> <p>The study found that information was assembled through different sources, including paper based sources, verbal sources, simple technology such as whiteboards and digital patient records.</p> <p>More importantly, these media sources were distributed over different locations.</p> <p>The information disassembly and information assembly process took place almost in parallel within a brief period of time.</p> <p>Technology design must take these factors into account.</p> <p>More importantly, the authors acknowledged the difficulties in evaluating information flow within the workplace given the complexity of interaction.</p>	<p>The evaluation framework for handover is difficult, due to the complexity of the process.</p> <p>The paper points to the need for more research into techniques for linking work flow and technology designs for handover systems.</p>
3	Wilson et al, 2007	<ul style="list-style-type: none"> • Qualitative, including ethnography, artefact analysis and semi-structured interviews 	<p>Paper uses evaluation of simple technological artefacts to argue for the need to take an holistic system based view of handover.</p> <p>The paper recommends using 'in use, in situ' evaluation, rather than pure usability testing when evaluating technology artefacts in supporting clinical handover.</p> <p>The study identified many issues,</p>	<p>The paper presents an important argument for holistic evaluation frameworks in complex working situations.</p> <p>Evaluation frameworks needs to be further established in order to compare handover interventions.</p> <p>The paper also points towards the need for holistic frameworks to evaluate socio-technical aspects of handover.</p>

			especially the issues of quality of work, individual and system goals and collaborative use and the impact of artefacts on the users.	
3	Wong and Levy, 2005	<ul style="list-style-type: none"> Retrospective case note review 	<p>Paper presents a study investigating inter-hospital transfer of surgical emergencies from rural and peripheral metropolitan areas.</p> <p>22 patients were included, 10 were physiologically unstable prior to transfer.</p> <p>Hospital systemic issues were associated with mortality, including delays in transfers and inadequate transport process.</p>	Although there are numerous papers examining inter-hospital transfer, investigations of the handover aspects of the transfer are limited.

CATEGORY 4 – Evidence Gaps on Clinical Handover			
Category	Name	Type: Opinions and Reviews	Commentary
4	Forrester et al, 2005	Opinion and guide theme: Legal issues	This is a very good review and opinion piece, which provides some guidance regarding the legal aspect of handover, including communication issues and documentation issues.
4	Hearns and Shirley, 2007	Opinion and guide theme: Retrieval and patient transfer	This is the second part of the review and guide. It suggests systems which might help. These include operating procedure and protocol, communication protocols and training. This is a relatively new field of medicine and the handover component will need to be developed in the future.
4	Karp, 2006	Opinion theme: Legal issues	This is a short opinion piece in regards to handover and malpractice claim and the need to be vigilant about handover communication issues.
4	Koppenberg and Taeger, 2002	Opinion theme: Inter-hospital transfer	This article provides an overview of the current healthcare system in developed countries. It is argued that inter-hospital transport system might have an increasing role in the future due to the dramatic changes in the organisation of healthcare system. The article summarises the current literature and suggests that there are few developed systems to provide handover of inter-hospital transfer.
4	Patterson, 2008	Opinion	This is a short commentary on the assumptions under-pinning recent trends towards standardising handover. It is useful for stimulating thinking about the challenges of providing structure whilst retaining flexibility in the conduct of handovers.
4	Shirley & Hearns, 2007	Opinion and guide Theme: retrieval and patient transfer	This is a review and a guide for retrieval medicine and patient transfer. This is the first part of the guide, which suggests some model for the provision of retrieval medicine and patient transfer.

CATEGORY 5 – Evidence Gaps on Clinical Handover			
Category	Name	Type: Report	Commentary
5	Australian Council for Safety and Quality in Health Care, 2005	Clinical handover and patient safety: Literature review report	<p>This literature review, conducted by the Australian Resource Centre for Healthcare Innovation (ARCHI) aims to identify factors relating to clinical handover that are associated with patient safety; the effectiveness of a safety culture within non-health industries and the quality of evidence and gaps in research.</p> <p>Specific remarks on evidence gaps:</p> <ul style="list-style-type: none"> • Patient safety research and incidence reporting need to include clinical handover. • More studies need to be conducted to establish best practice. • Definition of effectiveness in handover needs to be clearly defined. • Evidence based guidelines are urgently needed. • Effective handover will be integrated into undergraduate health professional education. • Minimum data sets around handover and communications are urgently needed. • New ways to promote innovation and creativity within healthcare organisations. • Evaluation framework for studies regarding handover needs to be established.
5	Australian Medical Association (AMA), 2006	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover and provides examples of good models of handover from which doctors and hospital managers can learn from. Emphasizes continuity of information, the need for organisational change, care planning and prioritization of tasks and recognises range of handover types.</p> <p>Specific remarks on evidence gaps include:</p> <ul style="list-style-type: none"> • Insufficient research conducted on clinical handover. • Lack of handover policies in hospitals.

5	British Medical Association (BMA) and National Health Service (NHS), 2004	Safe handover: Safe patients – Guidance on clinical handover for clinicians and managers	<p>This document aims to provide guidance to doctors on best practice in handover. It provides examples of good handover and aims to derive further developments in standardising handover arrangements in hospitals in the United Kingdom.</p> <p>Specific remarks on evidence gaps include:</p> <ul style="list-style-type: none"> • Training and education at undergraduate level. • The lack of standardised protocols. • National audit of handover implementation.
5	Royal College of Surgeons of England, 2007	Safe handover: Guidance from the working time directive working party	<p>This is the report from the Royal College of Surgeons of England regarding safe handover.</p> <p>Specific remarks on evidence gaps:</p> <ul style="list-style-type: none"> • Areas of risks such as mis-identification of patient, confidentiality, responsibility and tasks assignment should be better clarified. • Involvement of other healthcare professionals might be appropriate and should be better defined. • Potential of information tools, such as computers, whiteboards etc should be investigated.
5	World Health Organisation (WHO) and Joint Commission International Centre for Patient Safety (JCI), 2008	Patient safety solution 3: Communication during patient handovers	<p>This is a joint report by the World Health Organisation and the Joint Commission International Centre for Patient Safety. It describes Patient safety solution 3: Communication during patient handovers.</p> <p>Specific remarks on evidence gaps:</p> <ul style="list-style-type: none"> • Involvement of patients and family. • New technologies and methods which could improve handover. • Procedures to ensure electronic technology for patient care are interactive and effective. • Lack of accepted research, data and economic rationale for implementation of improvement strategies.

6. Comprehensive Bibliography

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